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भाकृअनुप-अ खल भारतीय समन्वित आलू अनुसंधान परियोजना  
**ICAR-All India Coordinated Research Project on Potato**

वा र्षक प्रतिवेदन  
**Annual Report**  
**2016-17**



भाकृअनुप-केन्द्रीय आलू अनुसंधान संस्थान  
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## PREFACE

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All India Coordinated Research Project on Potato initiated in 1970-71 is operating through 17 State Agricultural Universities based centers, 7 ICAR-CPRI based centers and 1 voluntary center.

In this 45<sup>th</sup> Annual Report of AICRP (Potato), experiments conducted during summer/*kharif* 2016 in hills/plateau and *rabi* 2016-17 in the plains have been reported. There were 18 experiments in Crop Improvement, 15 in Crop Production and 11 in Crop Protection at various locations. Efforts have been made to collect, consolidate, analyze and compile the data collected from those experiments in this report. Based on the pooled analysis of the performance data of advanced hybrids, five promising hybrids have been identified and are being proposed for release. Besides, three technologies related to Crop Production & one related to Plant Protection have been identified and if recommended, will be passed on to the respective State Department of Agriculture/Horticulture.

I would like to record my sincere thanks to Dr AK Singh, Deputy Director General (Horticultural Science), Dr T Janakiram, Assistant Director General (Horticultural Science-II), ICAR, New Delhi and Director, ICAR-CPRI for their keen interest in the programme, help and guidance. I am indebted to my colleagues Dr VK Dua, (Head, Crop Production), Dr Vinay Bhardwaj (Acting Head, Crop Improvement) and Dr Sanjeev Sharma, (Acting Head, Crop Protection) for their help in compiling this annual report.

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August, 2017  
Shimla



SK Chakrabarti  
Director & Project Coordinator

## ABBREVIATIONS

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AICRP	All India Coordinated Research Project	PTM	Potato tuber moth
Av.	Average	PTR	<i>Purple top roll</i>
B	Boron	PUN	Pune
BHN	Bhubaneshwar	RBD	Randomized block design
BW	Bacterial wilt	RBDF	Randomized block design Factorial
BS	Black Scurf	RDF	Recommended dose of fertilizers
CD	Critical difference	Rs	Rupees
CHN	Chhindwara	RPR	Raipur
CPRS	Central Potato Research Station	SEd	Standard error of difference
CS	Common Scab	SHI	Shillong
CV	Coefficient of variation	SM	<i>Severe mosaic</i>
cv.	Cultivar	SN	<i>Stem necrosis</i>
DAP	Days after planting	SPT	Split plot
DES	Deesa	SRI	Srinagar
DHL	Dholi	SW	<i>Sclerotium wilt</i>
DWD	Dharwad	t	tonne
EB	Early blight	V	Variety
FZB	Faizabad	Zn	Zinc
g or gm	Gram		
GWL	Gwalior		
ha	Hectare		
HIS	Hisar		
HSN	Hassan		
HYB	Hybrid		
IPM	Integrated pest management		
JAL	Jalandhar		
JRH	Jorhat		
K	Kufri		
K	Potassium		
kg	kilogram		
KAL	Kalyani		
KAN	Kanpur		
KBD	Kufri Badshah		
KCM	Kufri Chandramukhi		
KFI	Kufri		
Kg	Kilogram		
KTT	Kota		
LB	Late blight		
LR	<i>Leaf roll</i>		
MDP	Modipuram		
MM	<i>Mild mosaic</i>		
N	Nitrogen		
OC	Organic carbon		
OOT	Ootacamund		
P	Phosphorus		
PALCD	Potato apical leaf curl diseases		
PAS	Pasighat		
PAT	Patna		
PLRV	<i>Potato leaf roll virus</i>		
PNT	Pantnagar		

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## CROP IMPROVEMENT

### GENET. 1: EVALUATION OF GERMPLASM

#### 1.(b): Evaluation against potato apical leaf curl disease

One hundred nineteen germplasm accessions including 103 CP Nos., 15 hybrids and one variety were evaluated against potato apical leaf curl virus (PALCVD) at Hisar. CP 3774, CP 3802, CP 3818, CP 3839, CP 3846, CP 3850, CP 3878, CP 3881, CP 3911, CP 3974, CP 3985, CP 4030, CP 4060 and K. Bahar were found highly resistant ( $\leq 10\%$  infection) to apical leaf curl virus. Besides, 9 accessions and two hybrids were found moderately resistant to PALCVD ( $\leq 20\%$  infection).

Location	: Hisar	Year	: 2016-17
Design	: Single row progeny	Plot size	: Single row of 2.40 m
Replication	: Two	Spacing (cm)	: 60 x 20 cm
Row to row	: 60 cm	Plant to plant	: 20 cm
N:P:K dose	: 150:50:100 kg/ha	Date of planting	: 05.10.16
Date of haulm cutting	: 15.01.17	Date of harvesting	: 10.03.17
No of accession tested	: 118		

**Table 1:** Per cent Incidence of potato apical leaf curl disease at different intervals/days after emergence

Sr. No.	Accession/cultivar	Yield/row (Kg)	Percent incidence of PALCD at different interval /days after emergence						
			20 days	30 days	40 days	50 days	60 days	70 days	80 days
1.	CP-3773	0.253	0	0	10	20	20	30	40
2.	CP-3774	0.315	0	0	0	0	0	0	0
3.	CP-3775	0.095	0	10	10	10	20	20	20
4.	CP-3776	0.095	0	0	30	30	80	90	100
5.	CP-3778	0.101	0	10	10	20	40	40	40
6.	CP-3784	0.109	0	10	20	20	40	40	60
7.	CP-3785	0.073	0	20	40	60	80	100	100
8.	CP-3786	0.319	0	10	10	10	10	20	20
9.	CP-3787	0.191	0	10	20	40	60	60	80
10.	CP-3788	0.072	0	10	20	40	60	80	100
11.	CP-3790	0.071	0	0	10	40	60	80	80
12.	CP-3791	0.106	0	10	10	20	40	40	40
13.	CP-3792	0.006	0	10	20	40	60	100	100
14.	CP-3793	0.005	0	10	40	60	80	80	100
15.	CP-3794	0.017	0	10	40	60	80	100	100
16.	CP-3795	0.021	0	10	20	20	20	40	100
17.	CP-3798	0.088	0	10	20	20	20	40	40
18.	CP-3799	0.005	0	10	40	40	60	80	100
19.	CP-3802	0.060	0	0	0	0	0	0	0
20.	CP-3808	0.234	0	10	40	60	80	100	100
21.	CP-3809	0.071	0	10	20	40	60	80	100
22.	CP-3815	0.157	0	10	20	20	40	40	40
23.	CP-3816	0.029	0	10	10	10	10	10	20
24.	CP-3818	0.086	0	0	0	0	0	0	0
25.	CP-3835	0.018	0	10	40	60	80	80	100
26.	CP-3836	0.190	0	10	20	20	20	20	20
27.	CP-3838	0.086	0	10	20	40	60	80	100
28.	CP-3839	0.346	0	0	0	0	0	0	0
29.	CP-3840	0.150	0	10	20	40	60	60	80
30.	CP-3843	0.057	0	0	10	20	40	60	60
31.	CP-3845	0.114	0	10	10	20	40	40	60
32.	CP-3846	0.303	0	0	0	0	0	0	0
33.	CP-3847	0.168	0	10	10	20	40	60	80
34.	CP-3848	0.186	0	10	10	20	40	80	80

35.	CP-3849	0.330	0	10	20	20	40	40	40
36.	CP-3850	0.283	0	0	0	0	0	0	0
37.	CP-3851	0.027	0	10	40	60	80	80	100
38.	CP-3852	0.063	0	10	20	40	60	80	100
39.	CP-3853	0.228	0	10	10	20	40	40	40
40.	CP-3854	0.170	0	10	10	10	20	20	20
41.	CP-3855	0.219	0	10	10	10	40	60	60
42.	CP-3856	0.064	0	10	20	40	80	100	100
43.	CP-3857	0.095	0	20	20	40	60	80	100
44.	CP-3858	0.067	0	10	10	40	60	100	100
45.	CP-3859	0.158	0	10	10	20	40	60	80
46.	CP-3860	0.081	0	20	40	40	40	60	60
47.	CP-3861	0.092	0	10	20	40	60	80	100
48.	CP-3862	0.025	0	10	40	60	80	100	100
49.	CP-3863	0.009	0	10	10	20	40	60	80
50.	CP-3866	0.057	0	10	20	40	60	80	100
51.	CP-3869	0.436	0	10	20	30	40	80	100
52.	CP-3870	0.029	0	10	20	40	80	80	100
53.	CP-3871	0.064	0	10	10	20	40	60	80
54.	CP-3872	0.124	0	10	10	20	60	80	80
55.	CP-3873	0.273	0	10	20	40	40	60	60
56.	CP-3878	0.108	0	0	0	0	0	0	0
57.	CP-3879	0.178	0	10	10	20	20	40	60
58.	CP-3880	0.174	0	10	10	10	10	10	20
59.	CP-3881	0.308	0	0	0	0	0	0	0
60.	CP-3883	0.003	0	10	20	20	40	40	40
61.	CP-3885	0.034	0	10	10	10	20	20	40
62.	CP-3886	0.120	0	10	10	10	20	40	60
63.	CP-3889	0.162	0	10	20	20	40	40	60
64.	CP-3890	0.129	0	10	10	10	20	40	60
65.	CP-3891	0.150	0	10	10	20	20	40	60
66.	CP-3892	0.109	0	20	20	40	40	80	100
67.	CP-3893	0.121	0	10	20	40	80	100	100
68.	CP-3894	0.041	0	10	10	20	40	60	80
69.	CP-3895	0.167	0	10	20	40	40	40	40
70.	CP-3896	0.183	0	10	10	10	20	40	60
71.	CP-3898	0.247	0	10	10	10	40	60	80
72.	CP-3899	0.028	0	10	20	20	40	40	60
73.	CP-3901	0.020	0	10	40	60	80	80	100
74.	CP-3902	0.098	0	10	20	60	80	100	100
75.	CP-3903	0.034	0	10	10	10	20	40	60
76.	CP-3904	0.245	0	10	40	60	80	100	100
77.	CP-3905	0.223	0	10	10	10	10	20	40
78.	CP-3906	0.246	0	10	10	10	20	40	60
79.	CP-3907	0.350	0	20	40	40	60	60	60
80.	CP-3908	0.124	0	10	10	20	20	40	60
81.	CP-3909	0.190	0	10	20	40	80	80	100
82.	CP-3910	0.327	0	10	20	40	60	60	60
83.	CP-3911	0.121	0	0	0	0	0	0	0
84.	CP-3915	0.098	0	10	40	60	80	100	100
85.	CP-3917	0.151	0	10	40	40	60	80	100
86.	CP-3918	0.061	0	10	20	40	60	80	100
87.	CP-3919	0.223	0	20	20	20	40	40	40
88.	CP-3922	0.153	0	20	40	40	40	40	40
89.	CP-3937	0.068	0	20	40	60	60	60	80
90.	CP-3956	0.021	0	10	40	60	80	80	100
91.	CP-3967	0.007	0	20	20	40	40	60	80
92.	CP-3974	0.060	0	0	0	0	0	0	0
93.	CP-3978	0.023	0	10	40	60	80	80	100
94.	CP-3980	0.089	0	20	40	40	40	40	40



95.	CP-3982	0.068	0	10	10	10	40	60	80
96.	CP-3984	0.094	0	10	10	10	20	40	60
97.	CP-3985	0.076	0	0	0	0	0	0	0
98.	CP-3989	0.522	0	10	20	20	20	20	20
99.	CP-4030	0.161	0	0	0	0	0	0	0
100.	CP-4060	0.126	0	0	0	0	0	0	0
101.	CP-407	0.055	0	10	20	20	20	20	20
102.	CP-4080	0.277	0	10	20	20	20	20	60
103.	CP-4082	0.072	0	10	10	10	10	10	20
104.	J10-21	0.107	0	10	20	40	60	80	100
105.	J10-83	0.093	0	10	40	60	80	100	100
106.	J10-61	0.268	0	10	20	40	60	80	100
107.	J10-66	0.337	0	10	20	40	60	80	100
108.	J10-131	0.207	0	10	20	40	60	80	80
109.	J10-162	0.105	0	10	20	60	80	100	100
110.	J10-157	0.174	0	10	20	40	60	80	100
111.	C-28	0.592	0	10	20	20	20	20	20
112.	J10-180	0.226	0	10	20	40	60	80	100
113.	J10-51	0.097	0	10	10	40	60	80	100
114.	J11-191	0.534	0	10	20	40	60	80	100
115.	J11-33	0.195	0	20	30	40	60	80	100
116.	J11-45	0.165	0	10	20	20	40	60	80
117.	J11-65	0.102	0	10	20	40	60	80	80
118.	J11-126	0.260	0	10	10	20	20	20	20
119.	<b>K. Bahar</b>		0	0	0	0	0	0	0

## **GENET. 2: MULTIPLICATION OF GENETIC MATERIAL**

The following hybrids/varieties under evaluation were multiplied at seed preparatory units at CPRIC Modipuram (for plains) and CPRS, Kufri (for hills).

**Modipuram:** Thirty eight advance hybrids and twenty four varieties viz. CP-4054, CP-4175, HT/07-1105, HT/7-620, HT/7-1329, J/6-182, J/7-05, J/7-15, J/7-37, J/93-38, J/92-167, J/8-85, LBY-17, MCIP/9-11, MS/5-1543, MS/6-819, MS/6-1947, MS/7-645, MS/08-1565, MS/8-1148, MS/9-723, MS/9-2196, MP/01-916, MP/4-578, MP/4-816, MP/6-39, MP/8-1900, MP/9-901, MP/9-28, PS/06-88, PS/5-75, PS/8-31, PS/9-9, PS/7-7, SM/00-42, SM/00-120, VMT 5-1 and WS/05-146, Atlantic, Kufri Ashoka, Kufri Badshah, Kufri Bahar, Kufri Chandramukhi, Kufri Chipsona-1, Kufri Chipsona-3, Kufri Frysona, Kufri Garima, Kufri Gaurav, Kufri Jyoti, Kufri Khyati, Kufri Lalima, Kufri Lalit, Kufri Lauvkar, Kufri Mohan, Kufri Pukhraj, Kufri Pushkar, Kufri Sadabahar, Kufri Shailja, Kufri Sindhuri, Kufri Himalini, Kufri Himsona and Kufri Surya were multiplied.

**Kufri:** Three advance hybrids and five control varieties viz. SM/00-42, SM/00-120 and VMT 5-1 K Shailja, K Girdhari, K Himalini, K Giriraj and K Jyoti were multiplied.

#### GENET. 4: ON FARM TRIAL WITH EARLY AND MEDIUM MATURING HYBRIDS

Three advance hybrids viz., PS/06-88, MS/6-1947 and PS/S-75 along with control varieties Kufri Ashoka, K. Khyati, K. Pukhraj, K. Lalima, K. Lalit, K. Mohan, Kufri Garima and K. Jyoti were evaluated at 60, 75 and 90 days duration in on-farm trials at seven locations during rabi season in plains. Only two hybrids PS/06-88 and MS/6-1947 were evaluated at Kalyani, Pantnagar, Pasighat, Pune and Raipur. Only one hybrid MS/6-1947 was evaluated at 60, 75 and 90 days at Deesa, Gwalior, Kanpur, Kota. Present on-farm trial was second year evaluation for hybrids PS/06-88 and MS/6-1947, while it was first year evaluation for PS/5-75.

Plant emergence was normal at all locations (> 80%) except in some hybrids and controls at Kanpur and Raipur.

Hybrid MS/6-1947 outyielded the best control for both total and marketable tuber yields at Chhindwara, Deesa, Faizabad, Pune during 60 days duration; Chhindwara, Deesa, Faizabad, Hisar, Kanpur, Kota and Pune during 75 days and at Chhindwara, Deesa, Faizabad, Gwalior, Kanpur, Kota, Modipuram, Pantnagar and Pune during 90 days duration. Hybrid PS/06-58 outyielded the best control for both total and marketable tuber yields at Faizabad during 60, 75 and 90 days duration. Hybrid PS/5-75 also outyielded controls for both total and marketable tuber yields during 60 days crop duration at Faizabad.

Tuber dry matter of MS/6-1947 at 90 days harvest was lower than controls at most of the locations except at Chhindwara, Pantnagar and Pune. Keeping quality studies carried out at Raipur showed that PS/6-88 and MS/6-1947 has higher total weight loss after 75 days of storage at ambient temperature than controls Kufri Garima. But, the losses were less when compared to Kufri Khyari, Kufri Bahar, Kufri Pukhraj and Kufri Lalit.

The data obtained over locations was pooled across zones. In the northern plain locations viz., Hisar, Pantnagar and Modipuram the results with common two hybrids viz., MS/6-1947 and PS/06-88 and eight controls depicted that Kufri Khyati was the best for both total and marketable tuber yields at 60 days while at 75 and 90 days crop duration, MS/6-1947 was the best yielder, though the differences among hybrid and best controls were non-significant. In the eastern zone i.e. Faizabad, Kalyani, Patna and Pasighat, non significant differences were observed for both the yields at 60 and 75 days crop durations for all the genotypes. In central zone viz., Deesa, Chhindwara, Gwalior, Kanpur and Raipur both the tuber yields at 75 days and 90 days were significant and the hybrid, MS/6-1947 yielded statistically at par with the best control, Kufri Khyati.

**Two years pooled data for 2015-16 and 2016-17 in the northern plain locations** viz., Hisar, Jalandhar and Modipuram, showed non-significant differences among years while the hybrid MS/6-1947 showed at par total and marketable tuber yield to the best controls, Kufri Khyati and Kufri Pukhraj at 60 days crop duration and 75 & 90 days crop durations, respectively. The year × genotypes interactions as well as dry matter differences were non-significant.

**In the central plains** viz., Chhindwara, Deesa and Raipur, hybrid, MS/6-1947 showed at par total and marketable tuber yield to the best controls, Kufri Khyati at 60 days crop duration. The year to year yield differences were significant. All the three traits viz., total tuber yield, marketable tuber yield and dry matter content observed non-significant differences for both genotypes and years at 75 and 90 days crop durations.

**In the eastern plains** i.e. Faizabad, Kalyani and Patna, non-significant differences were observed for genotypes, years and genotypes × years interaction for all the three traits i.e. total tuber yield, marketable tuber yield and dry matter content except for year to year differences in both the yields at 75 days crop duration and marketable tuber yield at 60 days crop duration.

**Table 2:** Experimental details

Experimental detail/Centre	BHN	CHN	DES	FZB	GWL	HIS
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Replication/Location		4L	1L	3L	1L	2L
Plot size (m <sup>2</sup> )	7.20	96.00	20.00	48.00	48.00	96.00
Spacing (cm)	60X20	60x20	50x20	60x20	60x20	60x20
Planting date	30.11.16	07.11.16	14.11.16	15.11.16	26.10.16	18.10.16
Dehauling date 60DAP	-	07.01.17	13.01.17	14.01.17	26.12.16	18.12.16

	75 DAP	08.02.17	22.01.17	28.01.17	29.01.17	10.01.17	03.01.17
	90 DAP	-	06.02.17	12.02.17	14.02.17	16.01.17	18.01.17
Harvesting date	60DAP	-	27.02.17	23.02.17	24.01.17	09.01.17	22.02.17
	75 DAP	14.02.17	27.02.17	23.02.17	08.02.17	24.01.17	22.02.17
	90 DAP	-	27.02.17	23.02.17	22.02.17	31.01.17	22.02.17
N:P:K dose		150:80:100	120:100:100	275:138:275	150:100:120	180:80:100	150:50:100
Duration of crop (days)		75	60, 75 & 90	60, 75 & 90	60, 75 & 90	60, 75 & 90	60, 75 & 90

Table contd.....

Experimental detail/Centre	JAL	JRH	KAL	KAN	KTT	MDP
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Replication/Location	1L	3L	1L	4L	1L	1L
Plot size (m <sup>2</sup> )	48.00	96.00	36.00	96.00	36.00	28.80
Spacing (cm)	60x20	60x20	60x20	60x20	60x20	60x20
Planting date	14.10.16	25.11.16	09.12.16	27-28.10.16	17.11.16	31.10.16
Dehauling date	60 DAP	13.12.16	24.01.17	09.02.17	27-28.12.16	-
	75 DAP	28.12.16	08.02.17	25.02.17	11-12.01.17	02.02.17
	90 DAP	12.01.17	23.02.17	12.03.17	26-27.01.17	17.02.17
Harvesting date	60 DAP	09.01.17	31.01.17	19.02.17	03-04-05-06.03.17	-
	75 DAP	20.01.17	15.02.17	07.03.17	03-04-05-06.03.17	11.03.17
	90 DAP	07.02.17	02.03.17	22.03.17	03-04-05-06.03.17	11.03.17
N:P:K dose		240:100:150	120:100:100	200:150:150	180:80:100	187.5:125:125
Duration of crop (days)		60, 75 & 90	60, 75 & 90	60, 75 & 90	60, 75 & 90	90
						60, 75 & 90

Table contd.....

Experimental detail/Centre	PNT	PAS	PAT	PUN	RPR
Year	2016-17	2016-17	2016-17	2016-17	2016-17
Replication/Location	3L	1L	2L	4L	4L
Plot size (m <sup>2</sup> )	96.00	96.00	32.40	36.00	96.00
Spacing (cm)	60x20	60x20	60x20	60x20	60x20
Planting date	22-24.10.16	31.10.16	17-19.11.16	07.11.16	13.11.16
Dehauling date	60DAP	22-24-25.12.16	26.12.16	16.01.17	30.12.16
	75 DAP	07-09-10.01.17	10.01.17	30.01.17	13.01.17
	90 DAP	22-25.01.17	25.01.17	15.02.17	08.02.17
Harvesting date	60DAP	01-04-15.01.17	01.01.17	24.02.17	10.01.17
	75 DAP	18-20.01.17	16.01.17	24.02.17	22.01.17
	90 DAP	02-04-05.02.17	31.01.17	25.02.17	15.02.17
N:P:K dose		120:100:100	150 : 120 :100	150: 80: 100	150:60:120
Duration of crop (days)		60,75 & 90	60,75 & 90	75 & 90	60 ,75 & 90
					60,75 & 90

## BHUBANESHWAR

**Table 3:** Plant emergence (%), seed wt (t/ha), total and marketable tuber yield (t/ha) and weight (t/ha) of rotten tubers in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)
PS/06-88	91.00	1.29	17.00	15.37	0.15
MS/6-1947	100.00	1.30	20.68	18.73	0.22
PS/5-75	100.00	1.28	19.42	17.46	0.17
K Ashoka	92.00	0.60	19.61	17.42	0.19
K Khyati	93.00	1.00	20.04	18.18	0.15
K Pukhraj	98.00	1.03	17.86	16.46	1.11
K Lalima	98.00	1.23	22.79	20.65	0.28
K Lalit	96.00	1.36	25.17	23.82	0.21
K Mohan	90.00	1.10	24.20	22.42	0.42
K Jyoti	89.00	0.96	19.72	18.27	0.50

## CHHINDWARA

**Table 4:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 60 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
PS/06-88	91.50	4.37	51.75	24.40	21.66	16.13
MS/6-1947	91.75	4.78	53.50	25.15	23.19	16.63
PS/5-75	93.75	4.86	53.50	24.28	21.79	16.15
K Bahar	91.75	4.47	55.75	22.83	20.18	15.58
K Khyati	92.50	4.29	56.50	23.97	21.42	16.53
K Pukhraj	94.00	5.33	55.25	22.92	20.40	17.05
K Laukar	91.50	5.36	56.00	23.82	21.33	16.08
K Garima	93.75	4.55	56.75	24.45	21.94	16.30
K Mohan	89.75	4.34	53.50	22.63	20.07	16.13

**Table 5:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
PS/06-88	91.50	4.30	73.75	27.40	25.48	18.43
MS/6-1947	91.50	4.52	75.50	29.91	28.05	18.08
PS/5-75	94.00	4.65	74.00	26.57	24.46	18.13
K Bahar	91.00	4.34	76.25	24.98	22.90	17.08
K Khyati	92.75	4.24	75.50	26.00	23.92	17.28
K Pukhraj	94.00	5.30	76.00	25.63	23.50	18.03
K Laukar	91.75	5.30	75.75	25.84	23.76	17.03
K Garima	94.00	4.45	76.00	29.02	26.94	17.13
K Mohan	90.50	4.32	76.00	24.79	22.71	17.28

**Table 6:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
PS/06-88	92.25	4.33	83.75	31.02	29.15	18.70
MS/6-1947	91.50	4.47	85.25	32.10	30.21	19.48
PS/5-75	94.25	4.60	84.25	30.02	28.13	19.20
K Bahar	91.00	4.34	85.75	29.12	27.22	18.83
K Khyati	92.25	4.33	85.75	29.65	27.43	18.63
K Pukhraj	94.25	5.28	84.75	29.31	27.44	18.38
K Laukar	93.25	5.36	86.25	29.47	27.63	18.08
K Garima	92.25	4.46	85.75	31.75	29.84	18.23
K Mohan	91.25	4.36	87.00	29.08	27.15	18.63

## DEESA

**Table 7:** Plant emergence (%), seed wt. (t/ha), foliage senescence (1-5 scale), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 60 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
MS/6-1947	95.50	6.60	1.00	30.17	28.17	14.60
K Bahar	97.00	6.15	2.00	18.95	14.11	18.33

K Khyati	97.50	6.68	1.50	29.11	27.43	16.67
K Pukhraj	90.00	6.43	1.00	26.78	24.39	16.47
K Garima	89.50	6.28	1.50	19.85	17.75	17.80
K Mohan	92.50	6.65	1.00	23.10	21.50	15.47
K Badshah	98.00	6.73	1.50	19.01	17.47	17.73

**Table 8:** Plant emergence (%), seed wt. (t/ha), foliage senescence (1-5 scale), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
MS/6-1947	93.00	6.56	2.00	44.15	42.42	16.87
K Bahar	95.50	6.09	2.50	22.88	20.14	19.08
K Khyati	95.00	6.70	2.50	41.20	39.63	16.87
K Pukhraj	86.00	6.36	2.00	40.15	38.58	17.13
K Garima	94.50	6.19	2.50	22.56	21.44	20.47
K Mohan	92.50	6.71	2.00	25.55	24.55	16.47
K Badshah	99.00	6.76	3.00	29.46	27.97	17.93

**Table 9:** Plant emergence (%), seed wt. (t/ha), foliage senescence (1-5 scale), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
MS/6-1947	96.00	6.64	3.00	48.53	46.62	17.27
K Bahar	96.50	6.09	4.00	25.45	23.05	19.33
K Khyati	93.50	6.78	3.00	41.85	40.98	17.53
K Pukhraj	91.50	6.28	3.00	40.29	38.48	17.33
K Garima	93.50	6.22	3.00	29.74	28.46	21.60
K Mohan	93.50	6.66	3.00	32.15	31.15	17.13
K Badshah	98.00	6.71	4.00	29.64	28.57	18.00

## FAIZABAD

**Table 10:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha), weight of rotten tubers (t/ha and tuber dry matter (%) in 60 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	93.58	3.35	0.00	18.09	15.94	0.00	14.13
MS/6-1947	93.33	3.33	0.00	17.58	15.48	0.00	13.97
PS/5-75	92.92	3.33	0.00	17.52	15.42	0.00	13.80
K Ashoka	94.00	3.33	0.00	17.47	15.39	0.00	14.03
K Khyati	93.08	3.33	0.00	16.96	14.93	0.00	13.70
K Pukhraj	91.42	3.33	0.00	16.40	14.45	0.00	14.60
K Lalima	90.67	3.33	0.00	15.08	13.27	0.00	13.90
K Lalit	93.33	3.33	0.00	16.40	14.44	0.00	14.53
K Mohan	92.17	3.33	0.00	16.21	14.27	0.00	14.17
K Jyoti	92.83	3.35	0.00	15.81	13.92	0.00	14.20

**Table 11:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha), weight of rotten tubers (t/ha and tuber dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	92.58	3.52	18.33	28.11	25.27	0.12	17.33

MS/6-1947	92.08	3.51	13.33	28.07	24.96	0.15	17.07
PS/5-75	92.58	3.50	16.67	23.91	21.40	0.13	17.03
K Ashoka	92.42	3.52	16.67	26.46	23.80	0.12	17.23
K Khyati	92.33	3.49	15.00	23.64	21.28	0.11	17.40
K Pukhraj	92.33	3.50	6.67	27.01	24.29	0.10	17.53
K Lalima	93.50	3.50	5.00	22.53	20.34	0.11	16.97
K Lalit	92.42	3.51	8.33	25.87	23.34	0.18	17.37
K Mohan	90.92	3.49	10.00	24.97	22.52	0.12	17.10
K Jyoti	92.50	3.53	13.33	23.10	20.81	0.10	17.53

**Table 12:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha), weight of rotten tubers (t/ha and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	91.75	3.57	78.33	35.63	32.77	0.15	18.47
MS/6-1947	92.83	3.56	83.33	34.81	32.02	0.18	18.18
PS/5-75	92.67	3.56	78.33	29.11	26.78	0.17	18.00
K Ashoka	92.00	3.55	83.33	32.82	30.19	0.18	18.07
K Khyati	93.25	3.56	81.67	28.81	26.50	0.14	18.27
K Pukhraj	92.33	3.56	81.67	32.82	30.21	0.13	18.43
K Lalima	91.58	3.56	78.33	27.31	25.13	0.17	18.17
K Lalit	92.50	3.56	83.33	32.58	29.97	0.25	18.38
K Mohan	92.25	3.56	81.67	31.97	29.42	0.22	18.20
K Jyoti	91.50	3.57	83.33	29.96	27.56	0.16	18.53

## GWALIOR

**Table 13:** Plant emergence (%), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 60 &75 days crop.

Hybrid/variety	Emergence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)	60 days		75 days	
					Emergence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
MS/6-1947	93.00	23.66	21.51	14.49	93.00	37.46	35.08	16.21
J/100-152	79.50	21.27	18.90	14.95	79.50	25.22	23.07	17.19
K Khyati	83.13	19.04	17.48	14.26	83.13	29.72	27.98	16.16
K Mohan	85.00	23.32	22.24	14.20	85.00	30.23	28.24	15.97
K Laukar	81.23	22.88	21.52	16.09	81.23	29.96	28.45	18.04
K Garima	90.50	22.22	20.31	16.26	90.50	38.07	35.56	17.37
K Pukhraj	76.75	19.02	17.45	15.40	76.75	25.60	24.14	17.08
K Bahar	80.88	21.43	20.16	16.23	80.88	26.93	25.33	17.63
K Lalit	86.75	22.40	20.06	15.20	86.75	32.28	30.63	16.36

**Table 14:** Plant emergence (%), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
MS/6-1947	93.00	41.35	37.34	17.17
J/100-152	79.50	30.36	26.69	17.97
K Khyati	83.13	32.58	29.91	19.87
K Mohan	85.00	35.59	32.63	18.20
K Laukar	81.23	31.33	29.03	19.41
K Garima	90.50	39.30	36.30	18.30
K Pukhraj	76.75	29.31	27.53	17.61
K Bahar	80.88	30.69	28.70	19.15
K Lalit	86.75	35.58	32.77	18.32

## HISAR

**Table 15:** Plant emergence (%), seed wt. (t/ha), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 60 & 75 days crop

Hybrid/ variety	Emer- gence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Mkt yield (t/ha)	Tuber dry matter (%)	Emer- gence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Mkt yield (t/ha)	Tuber dry matter (%)
PS/06-88	93.95	3.35	16.87	12.52	12.60	96.76	3.61	24.82	19.84	16.00
MS/6-1947	96.64	3.63	24.56	21.37	14.70	96.25	3.61	34.66	31.06	17.60
PS/5-75	97.18	3.20	19.66	15.38	14.50	96.02	3.61	28.13	23.67	16.00
K Bahar	97.72	3.56	18.77	16.15	15.10	98.32	3.48	25.90	22.97	15.60
K Khyati	96.47	4.11	25.66	22.24	11.90	94.69	4.02	28.63	26.31	14.50
K Pukhraj	97.59	3.59	25.68	21.60	13.90	97.55	3.58	33.81	30.55	15.80
K Sadabahar	96.85	3.41	15.13	11.08	13.00	96.07	3.34	20.53	17.20	15.30
K Gaurav	94.07	3.68	12.86	9.48	12.70	95.55	3.58	18.82	15.98	13.00
K Mohan	95.47	4.14	24.92	22.09	10.90	95.64	4.21	29.65	26.22	14.70
K Lalit	96.62	4.31	21.41	18.20	14.50	95.70	4.42	27.26	23.87	16.30
K Lalima	94.70	4.02	13.34	10.28	15.00	94.27	4.02	22.81	20.12	15.70
K Garima	94.23	3.79	18.01	14.99	13.00	96.67	3.87	29.32	25.53	16.00

**Table 16:** Plant emergence (%), seed wt. (t/ha), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
PS/06-88	94.62	3.63	27.42	24.15	18.60
MS/6-1947	97.68	3.64	38.13	34.37	19.60
PS/5-75	94.86	3.63	31.74	27.87	17.90
K Bahar	95.94	3.69	33.16	30.45	17.10
K Khyati	96.96	3.92	30.24	25.90	15.60
K Pukhraj	97.14	3.99	34.73	31.37	19.60
K Sadabahar	94.72	4.07	23.37	22.18	16.60
K Gaurav	93.89	3.70	30.26	27.80	15.90
K Mohan	95.64	3.65	35.01	34.46	16.90
K Lalit	97.29	3.27	36.04	30.75	19.70
K Lalima	94.93	3.69	37.92	33.12	17.30
K Garima	94.73	3.94	36.88	35.51	18.60

## JALANDHAR

**Table 17:** Plant emergence (%), seed wt. (t/ha), total and marketable tuber yield (t/ha) in 60 & 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)
PS/06-88	94.00	5.64	16.35	16.00	96.00	5.60	26.02	24.71
MS/6-1947	96.00	5.78	20.80	19.82	94.00	5.72	32.93	30.76
PS/5-75	93.00	5.82	16.64	15.95	91.00	5.87	26.64	25.48
K Bahar	95.00	5.72	20.59	19.72	94.00	5.68	32.72	31.78
K Khyati	96.00	6.01	23.46	22.51	95.00	6.03	36.46	34.42
K Pukhraj	99.00	5.87	23.28	21.92	96.00	5.74	36.38	34.32



**Table 18:** Plant emergence (%), seed wt. (t/ha), total and marketable tuber yield (t/ha) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)
PS/06-88	93.00	5.68	35.57	33.95
MS/6-1947	95.00	5.72	43.26	41.70
PS/5-75	93.00	5.68	35.53	33.49
K Bahar	94.00	5.66	39.27	37.29
K Khyati	94.00	5.95	47.17	45.30
K Pukhraj	95.00	5.74	47.01	45.14

**KALYANI****Table 19:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and tuber dry matter (%) in 60 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
PS/06-88	83.30	2.17	0.00	21.82	19.52	17.50
MS/6-1947	93.30	2.22	0.00	23.19	21.16	16.20
K Ashoka	97.60	1.92	0.00	27.74	25.16	15.90
K Khyati	98.30	2.09	0.00	29.62	26.59	16.95
K Pukhraj	95.20	2.50	0.00	25.99	24.01	16.65
K Lalima	96.35	2.09	0.00	24.58	22.67	17.23
K Lalit	100.00	2.09	0.00	27.80	25.66	16.87
K Jyoti	100.00	2.22	0.00	27.49	25.40	17.96

**Table 20:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and tuber dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
PS/06-88	85.20	2.28	25.00	24.69	22.57	19.20
MS/6-1947	95.36	2.20	26.00	26.58	24.58	18.40
K Ashoka	98.65	2.00	35.00	31.97	29.92	19.80
K Khyati	97.80	2.20	27.00	33.42	28.14	19.50
K Pukhraj	96.55	2.78	26.00	30.37	27.89	20.33
K Lalima	95.94	2.36	29.00	32.96	31.29	20.01
K Lalit	99.33	2.28	24.00	33.20	30.55	19.78
K Jyoti	98.65	2.47	31.00	31.29	27.34	19.65

**Table 21:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
PS/06-88	83.22	2.36	55.00	27.42	25.89	20.80
MS/6-1947	96.11	2.29	65.00	29.84	27.95	20.14
K Ashoka	98.35	2.40	75.00	36.20	34.34	21.04
K Khyati	98.00	2.20	80.00	37.59	35.78	22.05
K Pukhraj	95.00	2.89	77.00	37.50	36.43	22.25
K Lalima	98.00	2.56	68.00	37.84	36.60	22.16
K Lalit	100.00	2.50	97.00	37.29	36.06	21.85
K Jyoti	98.00	2.65	85.00	36.75	34.90	22.11

## KANPUR

**Table 22:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 60 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/6-1947	87.47	3.12	7.60	11.99	9.73	0.00	9.25
K Bahar	95.90	2.64	7.88	6.81	6.04	0.00	10.90
K Khyati	84.22	3.62	12.00	18.31	12.51	0.00	9.50
K Pukhraj	87.25	3.83	8.25	16.85	11.17	0.00	10.23
K Garima	85.19	3.06	11.78	5.23	4.34	0.00	9.55
K Mohan	74.37	2.69	12.58	9.99	8.50	0.00	8.65
K Lalit	72.56	2.84	15.88	16.75	11.75	0.00	7.33
K Lalima	73.28	3.04	14.13	10.86	9.19	0.00	8.45

**Table 23:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/6-1947	88.19	3.16	28.05	37.33	32.13	0.00	12.38
K Bahar	96.27	2.68	32.50	26.59	22.39	0.00	15.60
K Khyati	84.81	3.65	28.13	36.47	31.29	0.00	12.00
K Pukhraj	87.79	3.85	28.88	36.91	31.76	0.00	12.15
K Garima	84.88	3.08	37.68	29.23	23.00	0.00	12.88
K Mohan	74.28	2.73	39.25	24.28	21.01	0.00	13.55
K Lalit	72.08	2.87	35.10	24.90	21.76	0.00	12.68
K Lalima	73.05	3.01	33.30	26.11	22.92	0.00	11.98

**Table 24:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/6-1947	87.66	3.13	53.30	51.27	41.89	0.25	18.23
K Bahar	96.08	2.67	70.50	29.98	23.57	0.22	21.53
K Khyati	85.28	3.63	59.55	32.94	31.44	0.36	19.43
K Pukhraj	88.44	3.84	62.50	43.38	32.10	0.36	18.75
K Garima	85.68	3.12	71.25	31.24	22.83	0.19	22.45
K Mohan	76.08	2.73	71.55	25.11	18.88	0.30	19.30
K Lalit	73.23	2.85	66.30	25.41	19.06	0.33	21.15
K Lalima	74.28	3.07	63.65	28.06	19.54	0.28	21.20

## KOTA

**Table 25:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/6-1947	95.50	5.98	70.00	23.07	22.38	0.18	22.01
K Bahar	95.60	4.34	80.35	12.57	11.56	0.18	22.80
K Khyati	96.50	5.78	75.23	18.10	17.18	0.23	20.90

K Pukhraj	95.00	3.75	80.00	11.31	10.23	0.21	21.10
K Garima	97.50	3.89	80.25	9.59	8.81	0.20	21.10

**Table 26:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/6-1947	96.50	6.06	75.22	33.67	32.50	0.33	22.66
K Bahar	95.50	4.36	86.22	19.77	18.57	0.36	23.10
K Khyati	96.50	5.70	80.22	28.13	27.19	0.31	21.60
K Pukhraj	95.00	3.73	86.22	15.37	14.29	0.30	21.90
K Garima	97.80	3.84	86.10	12.23	11.45	0.34	21.90

**Table 27:** Disease reaction

Hybrids	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	
	60 days			75 days			90 days			
MS/6-1947	Did not appear			Did not appear			Did not appear			0.0
K Bahar										8.5
K Khyati										2.0
K Pukhraj										16.0
K Garima										10.5

## MODIPURAM

**Table 28:** Plant emergence (%), seed wt. (t/ha), foliage senescence (1-5 Scale), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 60 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (1-5 Scale)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
PS/06-88	95.00	6.42	2.50	13.61	9.96	13.00
MS/6-1947	97.92	5.69	2.00	19.95	15.19	12.50
PS/5-75	97.50	6.32	2.50	16.26	12.41	14.60
K Bahar	98.33	5.62	2.50	19.30	14.41	13.50
K Khyati	97.50	5.55	2.00	18.60	15.21	12.30
K Pukhraj	95.83	7.29	2.50	18.25	13.35	13.40
K Sadabahar	95.83	5.69	2.00	13.84	9.85	14.00
K Gaurav	96.25	6.52	2.00	15.72	10.38	13.00
K Mohan	91.25	4.86	2.00	18.18	14.99	12.90
K Lalit	90.83	4.30	2.00	14.57	12.08	14.40
K Garima	90.00	5.83	2.00	15.27	12.35	14.10

**Table 29:** Plant emergence (%), seed wt. (t/ha), foliage senescence (1-5 Scale), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (1-5 Scale)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
PS/06-88	96.25	7.04	3.00	30.29	26.89	15.80
MS/6-1947	97.50	5.27	2.60	38.34	33.61	13.40
PS/5-75	95.83	5.76	2.80	32.88	27.81	15.40
K Bahar	97.50	5.70	3.00	35.50	31.34	14.20
K Khyati	98.33	5.52	2.80	34.47	30.45	12.80
K Pukhraj	98.33	6.94	2.80	36.26	32.07	14.00
K Sadabahar	95.00	6.80	2.60	26.05	22.79	15.70

K Gaurav	95.42	6.70	2.50	31.85	26.89	13.40
K Mohan	92.92	4.65	2.50	41.64	36.78	13.10
K Lalit	91.67	4.30	3.00	31.65	27.76	15.50
K Garima	90.00	5.55	2.60	37.06	33.59	15.60

**Table 30:** Plant emergence (%), seed wt. (t/ha), foliage senescence (1-5 Scale), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (1-5 Scale)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
PS/06-88	95.42	6.84	3.60	38.34	34.90	15.00
MS/6-1947	98.75	4.91	3.50	54.37	51.35	14.00
PS/5-75	95.00	6.77	3.60	35.74	31.97	17.80
K Bahar	98.33	6.65	3.80	41.75	38.66	17.80
K Khyati	97.50	5.90	3.50	44.03	41.14	15.00
K Pukhraj	95.83	8.40	3.50	48.50	43.85	16.10
K Sadabahar	94.58	6.32	3.30	38.10	34.46	15.60
K Gaurav	96.67	6.59	3.00	45.93	40.28	14.00
K Mohan	90.83	4.30	3.00	53.44	48.44	13.70
K Lalit	90.42	4.86	3.60	45.53	40.70	16.10
K Garima	93.75	4.89	3.30	42.47	36.78	16.80

**Table 31:** Total weight loss after 3 months storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rotting Weight basis	Total wt. Losses (%)
		At 6 weeks	End of storage (75days)			
PS/06-88	> 6 weeks	20.32	26.38	0.022	1.23	11.7
MS/6-1947	> 6 weeks	31.63	74.39	0.18	0.33	13.84
PS/5-75	> 6 weeks	30.31	62.84	0.27	2.23	13.18
K Bahar	> 6 weeks	87.81	87.81	0.11	0.44	12.74
K Khyati	> 6 weeks	0.00	3.38	0.01	8.30	14.23
K Pukhraj	> 6 weeks	12.36	46.12	0.10	0.52	9.52
K Sadabahar	> 6 weeks	70.46	70.46	0.41	1.55	12.32
K Gaurav	> 6 weeks	0.00	57.63	0.10	9.79	16.92
K Mohan	> 6 weeks	0.00	49.00	0.04	0.61	15.32
K Lalit	> 6 weeks	7.48	12.08	0.02	4.34	11.41
K Garima	> 6 weeks	12.43	23.91	0.03	1.01	17.95

## PANTNAGAR

**Table 32:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha) weight of rotten tubers (t/ha) and tuber dry matter (%) in 60 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	96.00	2.28	17.33	24.37	24.23	0.08	16.97
MS/6-1947	97.00	2.32	20.67	24.30	24.10	0.09	15.03
K Bahar	97.00	2.18	20.67	24.89	24.68	0.08	14.27
K Khyati	97.00	2.34	19.00	25.24	25.09	0.08	14.07
K Pukhraj	96.67	2.32	17.67	24.99	24.81	0.10	14.40
K Sadabahar	97.00	2.31	18.67	23.40	23.22	0.06	13.50
K Gaurav	96.33	2.31	21.67	24.99	24.84	0.06	14.13
K Mohan	97.00	2.41	18.00	24.51	27.79	0.06	13.70
K Lalit	97.67	2.30	20.67	24.30	24.09	0.06	13.70
K Lalima	97.33	2.43	22.00	22.57	22.41	0.02	13.83
K Garima	97.00	2.40	21.33	24.30	24.12	0.03	13.93

**Table 33:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha) weight of rotten tubers (t/ha) and tuber dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	97.00	2.42	75.00	33.11	32.95	0.03	16.20
MS/6-1947	97.00	2.11	69.00	32.48	32.02	0.04	15.07
K Bahar	97.00	2.33	74.33	34.15	33.93	0.04	14.07
K Khyati	97.00	2.40	72.33	33.94	33.78	0.06	13.97
K Pukhraj	97.00	2.43	64.00	34.63	34.48	0.05	14.17
K Sadabahar	96.33	2.42	64.00	32.48	32.38	0.06	13.47
K Gaurav	97.00	2.41	65.33	34.56	34.42	0.05	14.37
K Mohan	97.00	2.46	74.00	33.31	33.20	0.04	13.63
K Lalit	97.33	2.39	66.33	32.93	32.73	0.04	13.40
K Lalima	97.00	2.40	73.00	32.10	31.95	0.06	13.73
K Garima	97.33	2.48	66.67	33.14	32.90	0.06	13.70

**Table 34:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha) weight of rotten tubers (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	97.00	2.32	97.00	36.40	36.23	0.12	15.97
MS/6-1947	96.00	2.42	96.33	35.50	35.33	0.10	15.17
K Bahar	97.00	2.41	97.00	35.39	35.23	0.13	14.40
K Khyati	96.33	2.43	96.33	34.91	34.75	0.08	13.73
K Pukhraj	97.00	2.35	95.33	35.67	35.51	0.08	14.10
K Sadabahar	97.33	2.41	97.00	34.11	33.95	0.08	13.37
K Gaurav	97.00	2.44	96.00	35.39	35.25	0.08	13.97
K Mohan	97.00	2.39	95.67	34.18	34.04	0.11	14.00
K Lalit	97.00	2.35	96.67	34.01	33.85	0.09	13.40
K Lalima	97.33	2.42	96.00	33.31	33.16	0.06	13.60
K Garima	97.00	2.33	97.00	34.22	34.06	0.06	13.43

## PASIGHAT

**Table 35:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha) weight of rotten tubers (t/ha) and tuber dry matter (%) in 60 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	90.00	2.18	72.00	26.83	25.90	0.94	18.30
MS/6-1947	93.50	2.39	76.00	27.77	27.14	0.62	19.00
K Ashoka	89.50	2.08	70.00	24.54	23.61	0.94	19.70
K Khyati	94.00	2.29	72.00	28.91	27.77	1.14	18.30
K Pukhraj	96.25	2.18	74.00	29.54	28.70	0.83	17.07
K Lalima	92.50	2.50	81.00	27.04	26.10	0.94	20.22
K Jyoti	93.00	2.29	80.00	28.18	27.35	0.83	23.11

**Table 36:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha) weight of rotten tubers (t/ha) and tuber dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	89.50	2.29	86.00	27.56	26.42	1.14	17.20

MS/6-1947	92.25	2.18	82.00	29.95	29.02	0.94	19.20
K Ashoka	91.00	2.18	89.00	26.73	25.79	0.94	18.50
K Khyati	92.50	2.39	79.00	31.62	30.78	0.83	20.10
K Pukhraj	97.00	2.08	85.00	30.89	29.95	0.94	18.90
K Lalima	91.50	2.29	81.00	29.54	28.18	1.35	19.80
K Jyoti	90.50	2.50	85.00	30.06	29.22	0.83	21.70

**Table 37:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha) weight of rotten tubers (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	91.00	2.18	89.00	26.31	25.69	0.62	18.60
MS/6-1947	93.00	2.29	92.00	30.37	29.64	0.73	19.50
K Ashoka	90.50	2.18	91.00	27.46	26.73	0.73	18.80
K Khyati	93.00	2.50	87.00	31.72	31.10	0.62	19.20
K Pukhraj	96.25	2.29	94.00	32.03	31.51	0.52	17.70
K Lalima	90.00	2.18	92.00	30.16	29.43	0.73	19.90
K Jyoti	91.25	2.08	95.00	31.30	30.47	0.83	21.80

#### PATNA

**Table 38:** Plant emergence (%), foliage senescence (%), total & marketable tuber yield (t/ha) and tubers dry matter (%) in 60 days crop

Hybrid/variety	Emergence (%)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
PS/06-88	84.50	20.00	26.18	23.04	15.33
MS/6-1947	83.58	23.33	25.53	23.29	14.00
PS/5-75	84.11	19.67	26.36	22.32	15.50
K Ashoka	84.44	23.67	22.84	20.80	13.67
K Khyati	82.36	20.33	22.52	20.37	12.23
K Pukhraj	84.00	18.33	26.84	24.79	14.27
K Lalima	82.50	18.33	25.25	19.96	15.33
K Lalit	85.33	19.00	24.25	22.19	15.33
K Jyoti	83.83	21.17	23.03	21.15	14.13

**Table 39:** Plant emergence (%), foliage senescence (%), total & marketable tuber yield (t/ha) and tubers dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
PS/06-88	87.27	88.87	28.19	23.04	18.00
MS/6-1947	87.40	22.93	29.01	23.54	17.00
PS/5-75	86.83	24.17	28.05	20.88	17.43
K Ashoka	87.47	20.63	25.91	23.40	16.93
K Khyati	87.30	29.57	26.21	23.02	16.43
K Pukhraj	87.03	26.23	31.71	31.54	16.90
K Lalima	87.73	21.83	25.46	21.63	18.10
K Lalit	87.57	20.87	25.76	22.47	18.23
K Jyoti	88.87	19.90	29.30	24.62	17.63

**Table 40:** Plant emergence (%), foliage senescence (%), total & marketable tuber yield (t/ha) and tubers dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
PS/06-88	93.67	92.07	36.54	31.90	19.03
MS/6-1947	92.67	37.67	38.72	38.11	18.23
PS/5-75	93.00	35.17	35.42	28.77	18.57
K Ashoka	90.07	38.00	32.54	27.43	17.90
K Khyati	90.17	44.33	27.26	23.62	17.57
K Pukhraj	92.67	34.50	38.66	33.93	17.40
K Lalima	92.33	32.00	32.32	28.86	18.40
K Lalit	91.43	37.67	32.93	30.55	18.73
K Jyoti	92.07	42.00	39.37	31.96	18.30

**Table 41:** Total weight loss after 3 months storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rotting		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90 days)		Number basis	Weight basis	
PS/06-88	< 6 weeks	4.62	0.00	0.00	32.36	37.48	42.99
MS/6-1947	< 6 weeks	7.26	5.13	0.12	32.57	40.18	46.79
PS/5-75	< 6 weeks	6.46	0.00	0.00	47.43	48.36	53.82
K Ashoka	< 6 weeks	2.40	0.00	0.00	51.80	45.02	52.62
K Khyati	< 6 weeks	13.22	0.00	0.00	53.71	52.53	59.11
K Pukhraj	< 6 weeks	18.17	8.77	0.19	54.79	55.33	64.14
K Lalima	> 6 weeks	0.00	0.00	0.00	45.83	40.13	45.73
K Lalit	< 6 weeks	0.94	0.00	0.00	45.41	47.24	53.85
K Jyoti	> 6 weeks	0.00	0.00	0.00	45.33	47.20	53.77

## PUNE

**Table 42:** Plant emergence (%), seed wt. (t/ha), total and marketable tuber yield (t/ha) and average weight (t/ha) of rotten tubers in 60 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	91.00	2.28	11.31	10.88	0.40	18.20
MS/6-1947	96.00	2.34	11.68	11.34	0.33	18.12
K Jyoti	92.00	2.67	11.02	10.33	0.70	16.15
K Pukhraj	91.00	1.78	11.52	10.42	1.10	15.90
K Surya	94.00	2.67	11.44	10.56	0.88	16.20
K Himalini	93.00	2.45	10.68	10.12	0.56	15.85
K Lalit	90.00	2.25	10.72	9.84	0.88	16.10

**Table 43:** Plant emergence (%), seed wt. (t/ha), total and marketable tuber yield (t/ha) and average weight (t/ha) of rotten tubers in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	92.00	2.29	11.69	11.27	0.42	18.65
MS/6-1947	95.00	2.38	12.70	12.27	0.43	18.25
K Jyoti	90.00	2.64	11.47	10.68	0.79	16.4
K Pukhraj	91.00	1.85	11.83	10.72	1.11	16.12
K Surya	95.00	2.54	11.70	10.84	0.86	17.12
K Himalini	94.00	2.45	10.93	10.33	0.60	16.5
K Lalit	89.00	2.22	11.11	10.15	0.96	16.55

**Table 44:** Plant emergence (%), seed wt. (t/ha), total and marketable tuber yield (t/ha) and average weight (t/ha) of rotten tubers in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	93.00	2.31	75.00	12.27	11.72	0.56	18.95
MS/6-1947	95.00	2.35	77.00	13.39	12.91	0.47	19.12
K Jyoti	90.00	2.67	85.00	12.03	11.15	0.88	18.14
K Pukhraj	92.00	1.98	84.00	12.23	11.08	1.15	18.12
K Surya	94.00	2.53	86.00	11.94	10.95	0.99	18.8
K Himalini	95.00	2.43	85.00	12.00	11.12	0.88	17.8
K Lalit	88.00	2.27	89.00	12.33	11.25	1.08	18.2

#### RAIPUR

**Table 45:** Plant emergence (%), seed wt. (t/ha), foliage Senescence (%), total and marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 60 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	72.34	4.50	0.00	13.82	5.74	0.11	17.44
MS/6-1947	70.50	4.23	0.00	21.43	10.93	0.02	17.43
K Bahar	90.55	4.74	0.00	12.46	9.50	0.24	17.13
K Khyati	90.90	4.42	0.00	11.87	8.02	0.35	18.04
K Pukhraj	92.09	4.77	0.00	15.54	9.83	1.49	16.12
K Laukar	92.51	4.60	0.00	22.57	16.06	0.64	18.81
K Garima	91.67	4.42	0.00	15.00	8.10	1.26	17.97
K Lalit	92.86	4.65	0.00	13.12	7.60	1.27	18.89

**Table 46:** Plant emergence (%), seed wt. (t/ha), foliage Senescence (%), total and marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	72.34	4.50	17.15	13.82	9.35	0.35	18.46
MS/6-1947	70.50	4.23	20.75	21.43	14.75	0.52	19.18
K Bahar	90.55	4.74	25.45	20.39	12.28	0.16	21.13
K Khyati	90.90	4.42	20.65	15.20	8.36	0.60	20.92
K Pukhraj	92.09	4.77	19.50	22.41	13.59	0.08	18.17
K Laukar	92.51	4.60	23.35	24.00	18.05	0.09	19.71
K Garima	91.67	4.42	16.15	20.78	13.51	0.21	18.13
K Lalit	92.86	4.65	16.75	21.77	13.63	0.64	19.16

**Table 47:** Plant emergence (%), seed wt. (t/ha), foliage Senescence (%), total and marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
PS/06-88	72.34	4.50	81.75	19.78	11.85	0.47	19.55
MS/6-1947	70.50	4.23	81.79	23.95	14.26	0.76	20.92
K Bahar	90.55	4.74	81.05	33.30	20.59	1.93	21.51
K Khyati	90.90	4.42	77.61	28.74	18.20	0.71	21.11
K Pukhraj	92.09	4.77	82.72	25.87	12.70	1.49	21.10
K Laukar	92.51	4.60	79.25	28.06	22.84	0.69	20.05
K Garima	91.67	4.42	76.34	26.14	18.15	1.27	18.90
K Lalit	92.86	4.65	76.81	26.73	21.09	1.10	20.24



**Table 48:** Disease reaction

Hybrids	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
PS/06-88	Did not appear	Did not appear	Did not appear	8	15	Did not appear	13	18	
MS/6-1947				16	11		21	26	
K Bahar				13	16		17	21	
K Khyati				12	12		18	24	
K Pukhraj				6	9		9	19	
K Laukar				9	14		14	22	
K Garima				18	20		24	29	
K Lalit				15	18		23	18	

**Table 49:** Total weight loss after 75 days storage at ambient temperature

Hybrid/cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt. Loss due to sprouting (At the end of storage of 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
PS/06-88	> 6 weeks	Nil	Nil	0	30	29.48	31.19
MS/6-1947	> 6 weeks	Nil	Nil	0	40	35.57	37.16
K Bahar	> 6 weeks	Nil	Nil	0	50	42.91	44.16
K Khyati	> 6 weeks	Nil	Nil	0	40	52.51	54.65
K Pukhraj	> 6 weeks	Nil	Nil	0	50	46.99	48.30
K Laukar	> 6 weeks	Nil	Nil	0	40	34.61	36.23
K Garima	> 6 weeks	Nil	Nil	0	30	29.82	31.84
K Lalit	> 6 weeks	Nil	Nil	0	50	43.97	46.05

**POOLED OVER THE LOCATIONS (2016-17)****Table 50.1:** Pooled yield performance and dry matter under northern plains at HIS, MDP & PNT in 60, 75 & 90 days crop duration

Treatment	Total yield (t/ha)	Marketable yield (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
	60 days		75 days		90 days		
MS/6-1947	22.94	20.22	35.16	32.23	42.67	40.35	16.26
PS/06-88	18.28	15.57	29.41	26.56	34.05	31.76	16.52
K Bahar	20.99	18.41	31.85	29.41	36.77	34.78	16.43
K Khyati	23.17	20.85	32.35	30.18	36.39	33.93	14.78
K Pukhraj	22.97	19.92	34.90	32.37	39.63	36.91	16.60
K Sadabahar	17.46	14.72	26.35	24.12	31.86	30.20	15.19
K Gaurav	17.86	14.90	28.41	25.76	37.19	34.44	14.62
K Mohan	22.54	21.62	34.87	32.07	40.88	38.98	14.87
K Lalit	20.09	18.12	30.61	28.12	38.53	35.10	16.40
K Garima	19.19	17.15	33.17	30.67	37.86	35.45	16.28
CD (0.05%)	4.34	4.01	5.43	5.25	5.96	NS	NS
CV (%)	12.21	12.78	9.91	10.41	9.18	9.92	7.71

**Table 50.2:** Pooled yield performance and dry matter under central plains at CHN, DES, GWL, KAN & RPR in 60 days and at CHN, DES, GWL, KAN, RPR & KTT in 75 & 90 days crop duration

Treatment	Total yield (t/ha)	Marketable yield (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
	60 days		75 days		90 days		
MS/6-1947	22.48	18.71	32.23	29.14	38.48	33.80	19.29
K Bahar	16.50	14.00	22.39	19.10	28.05	23.62	20.58
K Khyati	20.46	17.37	27.78	24.73	32.32	29.19	19.70
K Pukhraj	20.22	16.65	27.00	23.63	30.59	25.42	19.18
K Garima	17.35	14.49	24.88	21.54	28.40	24.51	20.23
K Mohan	18.43	15.98	23.40	20.44	27.41	24.10	18.82
SE(d)	2.08	1.78	2.87	2.74	3.38	3.19	0.68
CD (0.05%)	NS	NS	5.95	5.67	7.01	6.60	NS
CV (%)	17.06	17.41	18.93	20.54	18.98	20.60	6.02

**Table 50.3:** Pooled yield performance and dry matter under eastern plains at FZB, KAL, PAT & PAS in 60 & 90 days and at FZB, KAL, PAT, PAS & BHN in 75 days crop duration

Treatment	Total yield (t/ha)	Marketable yield (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
	60 days		75 days		90 days		
MS/6-1947	23.52	21.77	26.86	24.17	33.44	31.93	19.01
PS/06-88	23.23	21.10	25.11	22.53	31.48	29.06	19.23
K Ashoka	23.15	21.24	26.14	24.07	32.26	29.67	18.95
K Khyati	24.50	22.42	26.99	24.28	31.35	29.25	19.27
K Pukhraj	24.69	22.99	27.57	26.03	35.25	33.02	18.95
K Lalima	22.99	20.50	26.66	24.42	31.91	30.01	19.66
K Lalit	24.27	22.55	27.89	25.73	33.20	31.40	19.88
K Jyoti	23.63	21.96	26.69	24.05	34.35	31.22	20.19
SE(d)	1.38	1.25	1.62	1.62	2.55	2.57	0.53
CD (0.05%)	NS	NS	NS	NS	NS	NS	NS
CV (%)	8.21	8.09	9.59	10.47	10.96	11.83	3.86

**POOLED OVER THE YEAR (2015-16 & 2016-17):**

**Table 50.4:** Performance under northern plains (HIS, JAL, MDP) at 60 days

Hybrid/Control	Year-1 (2015-16)	Year-2 (2016-17)	Mean	Year-1 (2015-16)	Year-2 (2016-17)	Mean
	Total yield (t/ha)			Marketable yield (t/ha)		
MS/6-1947	20.78	21.77	21.28	18.95	18.79	18.87
PS/06-88	15.74	15.61	15.68	14.65	12.83	13.74
K Khyati	19.79	22.57	21.18	17.65	19.99	18.82
K Pukhraj	21.34	22.40	21.87	18.26	18.96	18.61
MEAN	19.42	20.59		17.38	17.64	
CD (5%)	Year = NS; Genotype = 2.23; Year x Genotype = NS			Year = NS; Genotype = 2.30; Year x Genotype = NS		

**Table 50.5:** Performance under northern plains (HIS, JAL, MDP) at 75 days

Hybrid/Control	Year-1 (2015-16)	Year-2 (2016-17)	Mean	Year-1 (2015-16)	Year-2 (2016-17)	Mean
	Total yield (t/ha)			Marketable yield (t/ha)		
MS/6-1947	33.81	35.31	34.56	31.51	31.81	31.66
PS/06-88	25.85	27.04	26.45	23.47	23.81	23.64
K Khyati	30.77	33.19	31.98	28.64	30.39	29.52
K Pukhraj	31.94	35.48	33.71	28.71	32.31	30.51
MEAN	30.59	32.76		28.08	29.58	
CD (5%)	Year= NS; Genotype = 2.23; Year x Genotype = NS			Year= NS; Genotype = 3.58; Year x Genotype = NS		

**Table 50.6:** Performance under northern plains (HIS, JAL, MDP) at 90 days

Hybrid/ Control	Year-1 (2015-16)	Year-2 (2016-17)	Mean	Year-1 (2015-16)	Year-2 (2016-17)	Mean	Year-1 (2015-16)	Year-2 (2016-17)	Mean
	Total yield (t/ha)			Marketable yield (t/ha)			Dry matter (%)		
MS/6-1947	42.29	45.25	43.77	39.14	42.47	40.81	14.20	16.80	15.50
PS/06-88	33.41	33.78	33.59	30.88	31.00	30.94	16.40	16.80	16.60
K Khyati	37.96	40.48	39.22	35.00	37.45	36.23	16.50	15.30	15.90
K Pukhraj	43.03	43.41	43.22	39.92	40.12	40.02	16.20	17.90	17.00
MEAN	39.17	40.73		36.24	37.76		15.80	16.70	
CD (5%)	Year= NS; Genotype = 4.86 Year x Genotype = NS			Year= NS; Genotype = 5.29 Year x Genotype = NS			Year= NS; Genotype = NS Year x Genotype = NS		

**Table 50.7:** Performance under central plains (CHN, DES, RPR) at 60 days

Hybrid/ Control	Year-1 (2015-16)	Year-2 (2016-17)	Mean	Year-1 (2015-16)	Year-2 (2016-17)	Mean
	Total yield (t/ha)			Marketable yield (t/ha)		
MS/6-1947	20.63	25.58	23.11	18.25	25.68	21.96
K Bahar	14.47	18.08	16.27	13.55	17.15	15.35
K Khyati	19.24	21.65	20.45	18.74	24.43	21.58
K Pukhraj	18.13	21.75	19.94	16.46	22.40	19.43
Mean A	18.12	21.77		16.75	22.41	
CD (5%)	Year= 2.12; Genotype = 3.00; Year x Genotype = NS			Year= 3.47; Genotype = 4.91; Year x Genotype = NS		

**Table 50.8:** Performance under central plains (CHN, DES, RPR) at 75 days

Hybrid/ Control	Year-1 (2015-16)	Year-2 (2016-17)	Mean	Year-1 (2015-16)	Year-2 (2016-17)	Mean
	Total yield (t/ha)			Marketable yield (t/ha)		
MS/6-1947	30.48	31.83	31.15	34.63	35.24	34.93
K Bahar	22.34	22.75	22.55	26.82	21.52	24.17
K Khyati	28.73	27.47	28.10	34.06	31.78	32.92
K Pukhraj	26.81	29.40	28.10	31.00	31.04	31.02
Mean A	27.09	27.86		31.62	29.89	
CD (5%)	Year= NS; Genotype = NS; Year x Genotype = NS			Year= NS; Genotype = NS; Year x Genotype = NS		

**Table 50.9:** Performance under central plains (CHN, DES, RPR) at 90 days

Hybrid/ Control	Year-1 (2015-16)	Year-2 (2016-17)	Mean	Year-1 (2015-16)	Year-2 (2016-17)	Mean	Year-1 (2015-16)	Year-2 (2016-17)	Mean
	Total yield (t/ha)			Marketable yield (t/ha)			Dry matter (%)		
MS/6-1947	42.41	34.86	38.63	44.71	38.42	41.56	17.40	18.40	17.90
K Bahar	28.73	29.29	29.01	33.29	25.14	29.21	18.20	19.10	18.60
K Khyati	39.73	33.41	36.57	43.14	34.21	38.67	17.90	18.10	18.00
K Pukhraj	40.26	31.82	36.04	42.95	32.96	37.96	17.70	17.90	17.80
Mean A	37.78	32.35		41.02	32.68		17.80	18.30	
CD (5%)	Year= NS; Genotype = NS Year x Genotype = NS			Year= NS; Genotype = NS Year x Genotype = NS			Year= NS; Genotype = NS Year x Genotype = NS		

**Table 50.10:** Performance under eastern plains (FZB, KAL, PAT) at 60 days

Hybrid/ Control	Year-1 (2015-16)	Year-2 (2016-17)	Mean	Year-1 (2015-16)	Year-2 (2016-17)	Mean
	Total yield (t/ha)			Marketable yield (t/ha)		
MS/6-1947	16.70	20.39	18.54	14.61	18.32	16.47
PS/06-88	14.33	19.96	17.14	12.29	17.73	15.01
K Khyati	15.00	23.29	19.15	12.79	20.76	16.77
K Pukhraj	17.54	21.20	19.37	15.42	19.23	17.33
Mean A	15.89	21.21		13.78	19.01	
CD (5%)	Year= NS; Genotype = NS; Year x Genotype = NS			Year= 4.47; Genotype = NS; Year x Genotype = NS		

**Table 50.11:** Performance under eastern plains (FZB, KAL, PAT) at 75 days

Hybrid/ Control	Year-1 (2015-16)	Year-2 (2016-17)	Mean	Year-1 (2015-16)	Year-2 (2016-17)	Mean
	Total yield (t/ha)			Marketable yield (t/ha)		
MS/6-1947	24.81	27.89	26.35	21.80	24.36	23.08
PS/06-88	22.59	27.00	24.79	19.53	23.63	21.58
K Khyati	23.34	27.76	25.55	21.11	24.15	22.63
K Pukhraj	23.22	29.70	26.46	20.16	27.91	24.03
Mean A	23.49	28.08		20.65	25.01	
CD (5%)	Year= 3.68; Genotype = NS; Year x Genotype = NS			Year= 2.97; Genotype = NS; Year x Genotype = NS		

**Table 50.12:** Performance under eastern plains (FZB, KAL, PAT) at 90 days

Hybrid/ Control	Year-1 (2015-16)	Year-2 (2016-17)	Mean	Year-1 (2015-16)	Year-2 (2016-17)	Mean	Year-1 (2015-16)	Year-2 (2016-17)	Mean
	Total yield (t/ha)			Marketable yield (t/ha)			Dry matter (%)		
MS/6-1947	32.98	34.46	33.72	30.11	32.69	31.40	17.86	18.85	18.36
PS/06-88	31.58	33.20	32.39	27.74	30.19	28.97	17.89	19.43	18.66
K Khyati	30.77	31.22	30.99	28.10	28.63	28.37	17.28	19.30	18.29
K Pukhraj	32.91	36.33	34.62	29.78	33.52	31.65	17.72	19.36	18.54
Mean A	32.06	33.80		28.93	31.26		17.69	19.24	
CD (5%)	Year= NS; Genotype = NS Year x Genotype = NS			Year= NS; Genotype = NS Year x Genotype = NS			Year= NS; Genotype = NS Year x Genotype = NS		

## **GENET. 5: TRIAL WITH TABLE POTATO HYBRIDS (1<sup>st</sup> & 2<sup>nd</sup> years)**

Nine hybrids viz., J/6-182, MS/8-1148 and MS/9-723 (2<sup>nd</sup> year) MS/9-2196, J/7-5, J/7-15, J/7-37, PS/8-31 and MC IP/9-11 (1<sup>st</sup> year) with the controls were evaluated at 60, 75 and 90 days duration at 16 AICRP Centers during Rabi season. Evaluation at Patna and Pune was done only at 75 and 90 days crop duration, while at Kota, evaluation was done only at 90 days crop duration. The controls used were Kufri Ashoka, Kufri Khyati, Kufri Pukhraj, Kufri Lalima, Kufri Lalit, Kufri Mohan, Kufri Jyoti and Kufri Garima. Hybrids evaluations varied at different Centers viz., MS/8-1148 (16 Centres), MS/9-2196 (12 Centres), J/6-182 and J/7-37 (10 Centres), MS/9-723 (9 Centres), J/7-5, J/7-15 and MCIP 9-11(7 Centres) and PS/8-31 (3 Centres).

Plant emergence was normal at all the Centres except in some hybrids and controls at Kanpur, Raipur, Gwalior and Pasighat. Late blight appeared at Faizabad and the incidence was moderate in hybrids and at par with controls. At Jorhat, Pune, Pasighat, Kanpur and Kalyani, the late blight incidence was low in hybrids and at par with controls. At Faizabad, Kalyani, Jorhat and Raipur, moderate virus incidence was recorded in hybrids, which were almost at par with controls. At other Centres, viral diseases either did not appear or had low incidence.

For tuber yield, Kufri Pukhraj was the best control at 5 locations viz., Chhindwara, Deesa, Hisar, Kanpur, Raipur for 60 days, 7 locations viz., Deesa, Gwalior, Hisar, Kanpur, Patna, Pune and Raipur for 75 days and 7 locations viz., Chhindwara, Jalandhar, Kanpur, Kota, Pune and Raipur for 90 days crop durations. Kufri Khyati was best control for tuber yield at 6 locations viz., Gwalior, Jalandhar, Jorhat, Kalyani, Modipuram and Pasighat for 60 days, 3 locations viz., Jalandhar, Jorhat and Pasighat for 75 days and 3 locations viz., Deesa, Jorhat and Pasighat for 90 days crop durations. Kufri Lalit was best control for tuber yield at 3 locations viz., Bhubaneshwar, Faizabad and Kalyani for 75 days and at Bhubaneshwar, and Faizabad for 90 days crop durations. Kufri Garima was best control for tuber yield at 1 location each at 75 and 90 days crop duration. Kufri Jyoti was best control for tuber yield at 1 location for 60 days crop duration. Kufri Lalima was best control for tuber yield at 1 location for 90 days crop duration. Hybrid J/7-37 outyielded controls both for total and marketable yield at 60, 75 and 90 days crops durations at Raipur. The hybrid MS/8-1148 significantly outyielded controls for total tuber yield at 90 days crop duration at Hisar. MS/9-2196 significantly outyielded for total and marketable yield at 60, 75 and 90 days crop duration at Jalandhar. MS/9-723 significantly outyielded for both total and marketable yield at 60 and 75 days crop duration at Jorhat. At Jorhat, J/6-182 outyielded controls for both total and marketable yield at 75 and 90 days crop duration, while J/8-1148 outyielded controls for both total and marketable yield at 75 days crops duration. At Modipuram, J/7-15 outyielded controls for both total and marketable yield at 60 days crop duration. Hybrid MCIP/9-11 outyielded controls both for total and marketable yield at 90 days crop duration at Pune.

At most of the locations, no hybrid had significantly higher tuber dry matters than controls except J/6-182 which had high tuber dry matter at Chhindwara. Storage studies was conducted at Bhubaneshwar, Deesa, Faizabad, Modipuram, Pasighat, Pune and Raipur. At Pasighat, Pune and Faizabad, there was no significant difference for storage losses of hybrids as compared to the controls. At Bhubaneshwar, J/7-5, J/7-15, Kufri Ashoka, Kufri Khyati and Kufri Lalima at very low losses. MS/8-1148, Kufri Bahar and Kufri Lauvkar had low storage losses at Deesa. At Raipur, MS/8-1148 and Kufri Khyati had very low storage losses.

**Pooled data over locations and years in the northern plains** (Hisar, Jalandhar and Modipuram) including hybrids viz., MS/9-723, MS/9-2196, J/6-182 and MS/8-1148 along with three controls namely, Kufri Bahar, Kufri Pukhraj and Kufri Khyati showed significant differences for both total and marketable tuber yields for year and location factors. The hybrids under testing (MS/9-723, MS/9-2196, J/6-182 and MS/8-1148) observed significantly less total and marketable tuber yields than the best check Kufri Pukhraj at 75 and 90 days crop durations except for the hybrid MS/8-1148, which showed at par yield to best check Kufri Pukhraj at 90 days crop duration for total tuber yield. The interaction effects for all the three factors were also significant.

**In the central plains** (Chhindwara, Gwalior and Raipur at 60 days crop duration, and Chhindwara, Deesa, Gwalior, Kanpur, Raipur at 75 and 90 days crop duration) two hybrids namely J/6-182 and MS/8-1148 along with four control varieties viz., Kufri Bahar, Kufri Khyati, Kufri Pukhraj and Kufri Gaurav were evaluated. Significant differences were observed for total tuber yield for all the three factors i.e. years, locations and genotypes. Both the hybrids, J/6-182 and MS/8-1148 observed significantly less total and marketable tuber

yields than the best check Kufri Pukhraj at 60 and 75 days crop duration and Kufri Khyati at 90 days crop duration. Significant differences were observed for dry matter content over the years, locations and genotypes.

**In the eastern plains**, Faizabad, Jorhat, Kalyani and Bhubneshwar at 60 days crop duration and at Faizabad, Jorhat, Kalyani, Bhubneshwar and Patna at 75 and 90 days crop durations, two hybrids namely J/6-182 and MS/8-1148 and two controls viz., Kufri Khyati and Kufri Pukhraj were evaluated. All the three factors i.e. years, locations and genotypes as well as their interaction effects showed significant differences. However, hybrids under testing observed significantly less total and marketable tuber yields than the best check Kufri Khyati and Kufri Pukhraj at 60 and 75 days crop duration, respectively, except MS/08-1148, which recorded at par yields at 60 days crop duration. At 90 days crop duration non-significant differences were observed for the factor years and genotypes while interaction effects were found significant for both total and marketable tuber yields.

**Table 51:** Experimental details

Experimental detail/Centre	BHN	CHN	DES	FZB	GWL	HIS
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD	RBD
Replication	4	4	3	3	3	3
Plot size (m <sup>2</sup> )	7.20	10.80	4.80	7.20	9.00	7.20
Spacing (cm)	60 X 20	50 X 20	60 X 20	60 X 20	60 X 20	60 X 20
Planting date	19.11.16	07.11.16	13.11.16	22.11.17	26.10.16	18.10.16
Dehauling date	60 DAP	11.01.17	07.01.17	12.01.17	21.01.17	26.12.16
	75 DAP	26.01.17	22.01.17	27.01.17	05.02.17	10.01.17
	90 DAP	10.02.17	06.02.17	11.02.17	25.02.17	16.01.17
Harvesting date	60 DAP	18.01.17	27.02.17	23.02.17	01.02.17	09.01.17
	75 DAP	03.02.17	27.02.17	23.02.17	15.02.17	23.01.17
	90 DAP	16.02.17	27.02.17	23.02.17	04.03.17	30.01.17
Duration of crop (days)	60, 75 & 90	60, 75 & 90	60, 75 & 90	60, 75 & 90	60, 75 & 90	60, 75 & 90
NPK dose (kg/ha)	150:80:100	120:100:100	275:138:275	150:100:120	180:80:120	150:50:100

Table contd.....

Experimental detail/Centre	JAL	JRH	KAL	KAN	KTT
Year	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD
Replication	3	3	3	4	4
Plot size (m <sup>2</sup> )	5.40	7.20	6.00	7.20	9.00
Spacing (cm)	60 X 20	60 X 20	60 X 20	60 X 20	60 X 20
Planting date	15.10.16	29.11.16	01.12.16	28.10.16	22.11.16
Dehauling date	60 DAP	14.12.16	29.01.17	01.02.17	28.12.16
	75 DAP	29.12.16	16.02.17	16.02.17	13.01.17
	90 DAP	13.01.17	03.03.17	04.03.17	28.01.17
Harvesting date	60 DAP	09.01.17	05.02.17	10.02.17	25.02.17
	75 DAP	21.01.17	23.02.17	26.02.17	25.02.17
	90 DAP	07.02.17	10.03.17	14.03.17	25.02.17
Duration of crop (days)	60, 75 & 90	60, 75 & 90	60, 75 & 90	75&90	90
NPK dose (kg/ha)	240:100:150	120:100:100	200:150:150	180:80:100	187.5:125:125

Table contd.....

Experimental detail/Centre	MDP	PAS	PAT	PUN	RPR
Year	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD
Replication	3	3	3	3	4
Plot size (m <sup>2</sup> )	7.20	7.20	7.20	9.00	7.20
Spacing (cm)	60 X 20	60 X 20	60 X 20	60 X 20	60 X 20
Planting date	29.10.16	26.10.16	20.11.16	07.11.16	13.11.16
Dehauling date	60 DAP	30.12.16	21.12.16	-	12.01.17
	75 DAP	14.01.16	06.01.17	03.02.17	13.01.17
	90 DAP	29.01.16	13.01.17	18.02.17	12.02.17
Harvesting date	60 DAP	24.02.16	27.12.16	-	19.01.17

75 DAP	24.02.16	12.01.17	06.03.17	22.01.17	03.02.17
90 DAP	24.02.16	27.01.17	06.03.17	15.02.17	18.02.17
Duration of crop (days)	60, 75 & 90	60, 75 & 90	75&90	75 & 90	60, 75 & 90
NPK dose (kg/ha)	180:80:100	150:120:100	150:80:100	150:60:120	150:100:100

## BHUBANESHWAR

**Table 52:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MS/8-1148	84.25	4.58	9.50	22.34	21.23	1.11	16.80
MS/9-2196	92.25	4.77	7.50	20.84	19.52	1.92	16.00
J/7-05	90.50	4.08	14.50	18.94	18.22	1.01	16.00
J/7-15	89.50	4.58	8.75	24.15	23.40	1.02	17.03
J/7-37	88.25	4.99	7.25	16.89	15.90	1.11	15.68
K Ashoka	88.25	3.33	10.50	18.27	17.84	2.80	16.15
K Khyati	93.25	4.38	6.25	21.14	19.96	1.33	15.00
K Pukhraj	98.00	4.70	12.00	18.71	17.50	3.20	15.90
K Lalima	92.75	4.53	2.75	22.29	21.65	1.84	17.93
K Lalit	91.75	4.89	3.50	19.48	17.85	0.63	15.95
K Mohan	92.00	4.20	5.25	24.05	23.09	1.38	16.20
K Jyoti	90.50	2.83	7.50	16.20	15.64	0.61	16.55
SEd	1.78	0.14	0.98	0.73	0.75	0.16	0.29
CD (0.05)	3.65	0.28	2.01	1.49	1.54	0.32	0.58
CV (%)	2.77	4.47	17.48	5.07	5.50	14.77	2.49

**Table 53:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MS/8-1148	86.75	4.60	74.50	26.22	24.15	2.95	16.83
MS/9-2196	91.25	4.83	71.50	21.84	20.54	1.60	16.48
J/7-05	90.25	4.14	72.50	23.02	21.42	2.88	16.08
J/7-15	90.00	4.46	73.50	25.25	24.51	1.08	17.03
J/7-37	87.00	4.96	71.50	19.20	18.49	1.60	15.50
K Ashoka	87.25	3.40	77.50	20.03	19.42	2.71	16.35
K Khyati	92.50	4.43	62.25	23.29	22.13	1.29	16.50
K Pukhraj	96.00	4.71	82.75	19.22	18.59	3.23	16.03
K Lalima	93.50	4.48	54.50	23.79	22.22	3.02	17.48
K Lalit	90.25	4.97	61.50	26.46	24.96	0.66	16.65
K Mohan	90.50	4.35	70.25	23.02	22.10	1.32	16.45
K Jyoti	90.25	2.91	64.50	18.45	17.34	0.59	17.00
SEd	2.26	0.12	1.09	0.75	0.76	0.22	0.28
CD (0.05)	4.61	0.24	2.23	1.54	1.55	0.44	0.57
CV (%)	3.53	3.84	2.21	4.74	5.03	16.06	2.38

**Table 54:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MS/8-1148	84.50	4.51	97.25	21.28	21.03	1.50	17.03
MS/9-2196	91.00	4.75	97.50	25.60	25.02	1.04	17.85
J/7-05	90.00	4.04	96.50	21.00	20.70	0.73	15.83

J/7-15	89.00	4.61	97.75	20.64	20.24	0.63	18.35
J/7-37	86.75	4.95	97.25	19.01	18.52	0.52	16.15
K Ashoka	86.25	3.36	97.50	20.93	20.44	0.80	17.85
K Khyati	92.00	4.48	97.75	20.43	19.96	1.32	16.03
K Pukhraj	96.25	4.73	97.25	17.78	17.12	1.39	15.93
K Lalima	93.00	4.48	89.50	24.28	23.45	1.11	21.10
K Lalit	91.50	4.89	91.50	24.95	24.14	0.52	16.75
K Mohan	90.25	4.22	91.75	20.40	19.14	1.15	16.60
K Jyoti	88.25	2.90	90.50	18.33	17.81	0.56	18.03
SEd	2.44	0.13	1.11	0.75	0.81	0.19	0.31
CD (0.05)	4.99	0.26	2.26	1.53	1.66	0.40	0.63
CV (%)	3.84	4.21	1.65	4.98	5.57	29.32	2.51

**Table 55:** Total weight loss after 3 months storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rotting		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90 days)		Number basis	Weight basis	
MS/8-1148	More	0.00	9.00	0.00	18.20	0.00	29.20
MS/9-2196	More	0.00	25.00	0.00	14.30	0.00	45.50
J/7-05	More	5.00	47.40	0.00	2.00	0.00	7.50
J/7-15	More	0.00	0.00	0.00	12.00	0.00	7.70
J/7-37	More	0.00	4.35	0.00	17.40	0.00	31.50
K Ashoka	More	0.00	0.00	0.00	0.00	0.00	4.50
K Khyati	More	0.00	0.00	0.00	0.00	0.00	4.20
K Pukhraj	More	0.00	28.50	0.00	5.00	0.00	31.20
K Lalima	More	0.00	0.00	0.00	0.00	0.00	5.20
K Lalit	More	0.00	0.00	0.00	17.90	0.00	33.20
K Mohan	More	0.00	20.00	0.00	3.00	0.00	28.30
K Jyoti	More	0.00	0.00	0.00	5.90	0.00	15.90

## CHHINDWARA

**Table 56:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	90.33	4.75	66.00	18.92	15.03	17.70
MS/8-1148	91.00	4.82	69.00	20.37	16.48	17.13
MS/9-723	92.67	4.85	71.00	19.91	16.02	16.67
MS/9-2196	91.67	3.89	70.33	19.54	15.65	17.20
J/7-37	91.33	4.82	70.00	21.30	17.41	16.53
K Bahar	91.00	4.08	71.00	18.52	14.63	14.73
K Khyati	92.33	4.85	67.33	21.72	17.83	16.47
K Pukhraj	93.00	4.72	67.67	23.74	19.85	17.37
K Laukar	91.33	4.88	67.67	20.88	17.00	17.33
K Garima	94.00	4.14	67.33	22.65	18.76	16.40
K Mohan	91.00	3.80	66.00	19.45	15.56	16.13
SEd	1.76	0.13	1.67	0.87	0.57	0.51
CD (0.05)	NS	0.28	3.50	1.82	1.19	1.07
CV (%)	2.35	3.60	2.98	5.14	4.15	3.73



**Table 57:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	92.33	4.82	75.33	25.19	22.22	17.90
MS/8-1148	91.33	4.72	77.33	26.02	23.06	18.50
MS/9-723	90.67	4.35	81.00	24.08	21.11	18.07
MS/9-2196	91.67	4.04	81.00	25.47	22.50	18.40
J/7-37	90.00	4.75	77.00	26.75	23.79	17.33
K Bahar	90.00	3.89	82.33	22.32	19.35	17.47
K Khyati	93.00	4.75	77.00	26.66	23.70	17.47
K Pukhraj	92.33	4.69	79.00	27.02	24.06	18.60
K Laukar	90.33	4.89	79.00	25.59	22.64	18.20
K Garima	92.33	3.84	77.67	27.17	24.21	17.10
K Mohan	87.33	3.73	78.33	24.81	21.85	17.37
SEd	1.88	0.18	1.63	0.45	0.38	0.17
CD (0.05)	NS	0.38	3.42	0.94	0.80	0.35
CV (%)	2.52	5.06	2.54	2.15	2.07	1.14

**Table 58:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	91.00	4.72	85.33	26.55	25.21	19.10
MS/8-1148	91.67	3.95	90.33	28.24	26.90	18.90
MS/9-723	91.67	3.92	92.00	25.93	24.58	18.97
MS/9-2196	91.33	3.98	91.67	27.67	26.33	19.07
J/7-37	91.33	4.72	89.33	29.17	27.82	18.20
K Bahar	90.33	3.80	89.00	25.46	24.12	18.37
K Khyati	92.67	4.71	89.00	28.70	27.36	18.80
K Pukhraj	91.67	4.77	90.67	30.99	29.64	18.37
K Laukar	91.33	4.82	89.33	27.96	26.63	18.37
K Garima	92.33	3.77	87.00	30.36	29.12	18.20
K Mohan	90.33	3.80	85.33	26.15	24.82	18.57
SEd	1.53	0.12	1.15	0.54	0.33	0.13
CD (0.05)	NS	0.24	2.42	1.13	0.69	0.27
CV (%)	2.05	3.31	1.58	2.37	1.52	0.84

**Table 59:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	60 days			75 days			90 days		
J/6-182	0.0	3.0	2.4	0.0	3.2	2.5	3.4	2.6	2.7
MS/8-1148	0.0	2.3	2.0	2.6	2.4	2.4	0.0	3.0	2.6
MS/9-723	0.0	3.1	2.0	0.0	3.2	3.0	0.0	3.4	3.0
MS/9-2196	0.0	3.0	2.1	0.0	3.2	3.0	0.0	3.2	3.0
J/7-37	0.0	3.1	2.2	0.0	3.0	3.2	0.0	3.3	3.1
K Bahar	0.0	2.1	2.1	0.0	2.6	2.1	0.0	3.0	2.5
K Khyati	0.0	3.2	3.0	0.0	3.2	2.7	0.0	3.6	3.0
K Pukhraj	0.0	2.3	2.0	0.0	2.6	2.3	0.0	3.3	2.8
K Laukar	0.0	3.0	2.5	0.0	2.7	2.5	0.0	3.3	3.0
K Garima	0.0	2.3	2.3	0.0	3.0	2.0	0.0	3.0	3.2
K Mohan	0.0	3.0	3.1	0.0	3.2	3.0	0.0	3.2	3.4

## DEESA

**Table 60:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	81.25	6.40	1.50	12.91	10.30	18.00
MS/8-1148	85.42	6.71	1.17	18.16	15.69	16.33
MS/9-2196	88.19	6.62	1.50	22.02	20.53	16.53
J/7-15	84.03	6.62	1.67	18.95	17.69	17.87
J/7-37	85.42	6.47	1.17	23.89	21.36	16.67
MCIP/9-11	83.06	6.48	1.50	21.94	20.90	17.47
K Bahar	82.64	6.82	2.17	12.89	11.06	18.50
K Khyati	80.56	6.78	1.50	24.72	22.37	15.07
K Pukhraj	88.19	6.92	1.50	25.82	23.66	17.67
K Laukar	89.58	6.79	2.17	20.87	19.33	18.60
K Garima	89.61	6.63	1.17	17.76	15.95	18.47
K Badshah	98.61	7.07	1.50	17.31	14.39	16.60
SEd	3.43	0.10	0.17	1.44	1.39	0.53
CD (0.05)	7.16	0.22	0.36	3.01	2.90	1.11
CV (%)	4.86	1.89	13.54	8.94	9.58	3.77

**Table 61:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	82.64	6.47	3.00	24.74	21.96	19.73
MS/8-1148	88.89	6.70	1.67	29.85	27.36	19.27
MS/9-2196	87.27	6.61	2.50	30.48	29.08	18.80
J/7-15	87.92	6.59	3.50	31.04	30.26	18.23
J/7-37	84.72	6.39	2.00	32.45	31.53	19.33
MCIP/9-11	85.33	6.47	2.00	28.39	27.14	19.50
K Bahar	84.72	6.84	3.67	19.49	18.13	18.93
K Khyati	85.42	6.80	2.25	40.15	38.00	17.60
K Pukhraj	93.52	6.98	2.83	40.32	38.39	19.23
K Laukar	92.58	6.84	4.00	32.87	31.03	19.73
K Garima	95.14	6.83	2.83	26.09	24.26	20.20
K Badshah	97.92	7.11	2.50	32.83	31.07	19.20
SEd	3.06	0.09	0.18	1.76	1.86	0.39
CD (0.05)	6.38	0.19	0.38	3.67	3.88	0.82
CV (%)	4.21	1.67	8.09	7.01	7.84	2.50

**Table 62:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	81.94	6.56	4.33	30.94	28.29	20.00
MS/8-1148	83.33	6.55	4.00	34.56	31.97	20.87
MS/9-2196	85.42	6.52	4.17	42.13	40.14	18.87
J/7-15	88.89	6.61	5.00	34.30	33.12	18.27
J/7-37	88.89	6.54	4.17	44.21	43.11	20.47
MCIP/9-11	89.58	6.53	4.00	40.19	39.33	20.20
K Bahar	83.33	7.05	5.00	26.07	24.34	19.17
K Khyati	87.50	6.88	4.17	52.23	49.75	18.27
K Pukhraj	93.75	7.01	4.17	51.00	47.78	19.33

K Laukar	92.36	6.89	4.83	36.92	34.71	21.13
K Garima	95.83	7.02	4.17	42.35	39.36	20.33
K Badshah	99.31	6.99	4.33	39.94	37.44	19.33
SEd	3.42	0.11	0.17	2.44	2.29	0.37
CD (0.05)	7.14	0.22	0.35	5.10	4.78	0.76
CV (%)	4.70	1.90	4.75	7.56	7.49	2.27

**Table 63:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	60 days			75 days			90 days		
J/6-182	Did not appear	0.00	7.85	Did not appear	6.66	6.66	Did not appear	8.82	8.12
MS/8-1148		0.00	2.94		5.56	2.77		9.61	0.88
MS/9-2196		0.00	1.22		9.24	0.00		7.38	1.64
J/7-15		9.57	7.46		14.11	6.24		3.49	0.00
J/7-37		1.64	1.64		0.83	2.50		3.90	0.00
MCIP/9-11		0.00	6.25		0.00	7.50		0.85	5.12
K Bahar		6.32	6.15		8.25	6.92		8.25	6.12
K Khyati		0.00	3.17		7.42	4.22		8.93	0.89
K Pukhraj		2.36	2.36		11.45	4.58		2.68	0.00
K Laukar		0.00	4.55		5.52	0.00		5.60	0.00
K Garima		0.00	3.20		7.30	8.03		9.97	5.02
K Badshah		4.92	0.00		5.67	1.41		4.19	2.09

**Table 64:** Total weight loss after 75 days storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
J/6-182	> 6 weeks	0.00	7.95	0.00	5.69	4.54	16.46
MS/8-1148	> 6 weeks	0.00	6.19	0.02	2.97	1.87	10.91
MS/9-2196	> 6 weeks	0.00	0.78	0.00	13.39	13.43	23.75
J/7-15	> 6 weeks	0.00	0.00	0.00	12.29	13.61	22.45
J/7-37	> 6 weeks	0.00	0.00	0.00	13.13	13.00	23.09
MCIP/9-11	> 6 weeks	0.00	0.00	0.00	7.65	6.94	16.81
K Bahar	> 6 weeks	0.00	31.82	0.40	0.62	0.91	9.70
K Khyati	> 6 weeks	0.00	0.00	0.00	7.60	7.18	16.89
K Pukhraj	> 6 weeks	0.00	0.33	0.00	3.03	2.79	12.19
K Laukar	> 6 weeks	0.00	2.56	0.01	2.56	2.44	9.14
K Garima	> 6 weeks	0.00	0.00	0.00	9.44	6.12	19.91
K Badshah	> 6 weeks	0.00	0.00	0.00	1.41	1.57	12.01

## FAIZABAD

**Table 65:** Plant emergence (%), seed wt.(t/ha), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	91.67	3.40	18.75	16.14	14.23
MS/8-1148	91.11	3.47	19.45	16.71	13.90
MS/9-723	92.78	3.38	17.53	15.07	13.83
MS/9-2196	92.22	3.38	16.83	14.49	14.00
J/7-05	91.67	3.47	17.67	15.19	13.77
J/7-15	90.00	3.42	16.55	14.24	14.07
J/7-37	91.67	3.47	18.06	15.53	13.87

PS/8-31	92.78	3.42	17.71	15.23	14.43
MCIP/9-11	92.22	3.33	17.36	14.96	14.30
K Ashoka	92.22	3.47	18.06	15.53	14.30
K Khyati	91.11	3.42	17.50	15.05	14.20
K Pukhraj	91.11	3.38	16.94	14.58	13.97
K Lalima	90.56	3.33	15.69	13.50	14.00
K Lalit	91.67	3.61	18.34	15.74	14.23
K Mohan	90.56	3.47	17.78	15.28	14.03
K Jyoti	92.22	3.40	18.64	16.02	14.43
SEd	1.90	0.09	0.96	0.83	0.14
CD (0.05)	NS	NS	NS	NS	0.28
CV (%)	2.53	3.31	6.68	6.66	1.19

**Table 66:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
J/6-182	92.22	3.47	18.33	27.64	24.61	1.30	17.47
MS/8-1148	90.56	3.42	18.33	28.89	25.72	1.33	17.27
MS/9-723	91.11	3.33	18.33	22.08	19.68	1.06	17.27
MS/9-2196	91.67	3.47	16.67	22.20	19.77	1.11	17.33
J/7-05	92.78	3.42	16.67	21.37	19.06	1.00	17.50
J/7-15	91.11	3.38	16.67	26.67	23.73	1.23	17.70
J/7-37	90.00	3.33	17.00	25.35	22.55	1.16	17.17
PS/8-31	91.11	3.61	15.00	24.15	21.51	1.11	17.63
MCIP/9-11	92.22	3.47	16.67	26.32	23.43	1.20	17.23
K Ashoka	91.11	3.40	18.33	23.96	21.32	1.11	17.33
K Khyati	91.67	3.52	15.00	23.47	20.88	1.08	17.43
K Pukhraj	93.33	3.40	11.67	21.42	19.03	0.97	17.47
K Lalima	90.00	3.42	8.33	27.23	24.19	1.25	17.62
K Lalit	92.22	3.42	11.67	27.78	24.73	1.25	17.42
K Mohan	90.00	3.47	10.00	27.36	24.36	1.26	17.37
K Jyoti	92.78	3.49	13.33	26.76	23.87	1.23	17.80
SEd	1.42	0.09	2.13	1.60	1.41	0.08	0.12
CD (0.05)	NS	NS	4.37	3.27	2.90	0.16	0.24
CV (%)	1.90	3.29	17.26	7.76	7.73	8.42	0.81

**Table 67:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
J/6-182	91.67	3.38	78.33	30.93	28.15	1.41	18.53
MS/8-1148	92.78	3.38	81.67	32.23	29.35	1.48	18.23
MS/9-723	92.22	3.47	83.33	26.25	23.91	1.18	18.10
MS/9-2196	92.22	3.42	78.33	24.59	22.36	1.13	18.23
J/7-05	91.11	3.47	76.67	23.91	21.76	1.08	18.37
J/7-15	91.11	3.42	81.67	29.61	26.94	1.37	18.50
J/7-37	90.56	3.33	78.33	27.92	25.42	1.29	18.27
PS/8-31	91.67	3.47	76.67	26.69	24.29	1.20	18.45
MCIP/9-11	90.56	3.42	83.33	28.99	26.39	1.33	18.27
K Ashoka	92.22	3.38	83.33	26.41	24.03	1.12	18.43
K Khyati	92.22	3.33	78.33	25.79	23.47	1.13	18.13
K Pukhraj	90.56	3.61	83.33	23.59	21.46	1.03	18.57
K Lalima	91.11	3.47	78.33	30.67	27.92	1.41	18.37
K Lalit	91.67	3.40	76.67	33.61	30.60	1.46	18.53
K Mohan	92.78	3.45	86.67	30.41	27.64	1.41	18.68

K Jyoti	91.11	3.47	83.33	29.17	26.55	1.32	18.78
SEd	1.65	0.09	2.37	1.49	1.35	0.07	0.08
CD (0.05)	NS	NS	4.87	3.05	2.78	0.14	0.16
CV (%)	2.20	3.29	3.61	6.46	6.46	6.41	0.51

**Table 68:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	60 days			75 days			90 days		
J/6-182	0	0	5	0	15	10	35	12	15
MS/8-1148	0	0	0	0	5	15	30	10	18
MS/9-723	0	0	5	0	15	20	40	8	25
MS/9-2196	0	0	0	0	10	5	30	15	10
J/7-05	0	0	2	0	10	10	25	12	12
J/7-15	0	0	5	0	20	0	30	18	5
J/7-37	0	0	0	0	10	20	25	12	15
PS/8-31	0	0	0	0	18	15	35	20	12
MCIP/9-11	0	0	0	0	20	10	40	25	15
K Ashoka	0	0	0	0	0	5	55	5	10
K Khyati	0	0	0	0	10	14	50	8	15
K Pukhraj	0	0	5	0	20	15	45	10	20
K Lalima	0	0	0	0	10	20	40	12	22
K Lalit	0	0	2	0	15	5	40	15	10
K Mohan	0	0	0	0	5	0	15	10	5
K Jyoti	0	0	0	0	10	0	30	12	10

**Table 69:** Total weight loss after 75 days Storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
J/6-182	> 6 weeks	0.0	20.0	2.2	12.4	11.1	13.3
MS/8-1148	> 6 weeks	0.0	15.6	1.6	10.5	9.4	11.0
MS/9-723	> 6 weeks	0.0	16.0	1.7	11.0	9.9	11.6
MS/9-2196	> 6 weeks	0.0	10.0	0.9	9.6	8.6	9.5
J/7-05	> 6 weeks	0.0	14.5	1.1	10.5	9.5	10.6
J/7-15	> 6 weeks	0.0	10.0	1.1	11.2	10.0	11.1
J/7-37	> 6 weeks	0.0	15.0	1.6	15.7	14.1	15.7
PS/8-31	> 6 weeks	0.0	12.5	1.1	12.4	11.2	12.3
MCIP/9-11	> 6 weeks	0.0	11.5	1.2	13.1	11.8	13.0
K Ashoka	> 6 weeks	0.0	22.2	2.8	15.7	14.1	16.9
K Khyati	> 6 weeks	0.0	11.6	1.1	11.4	10.3	11.4
K Pukhraj	> 6 weeks	0.0	12.8	1.2	12.3	11.1	12.3
K Lalima	> 6 weeks	0.0	15.0	1.5	14.2	12.8	14.3
K Lalit	> 6 weeks	0.0	28.0	3.0	16.5	14.8	17.8
K Mohan	> 6 weeks	0.0	25.0	2.5	12.8	11.5	14.0
K Jyoti	> 6 weeks	0.0	18.0	1.8	11.2	10.1	11.9

## GWALIOR

**Table 70:** Plant emergence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	78.52	14.19	11.87	16.04
MS/8-1148	80.00	11.02	9.52	14.82
MS/9-723	80.00	11.22	9.56	14.23
MS/9-2196	83.70	17.78	15.57	14.77
J/7-37	80.74	20.00	19.07	15.34
MS/7-645	77.78	17.54	15.37	13.31
J/2-14	86.30	15.46	13.45	14.22
K Mohan	78.89	17.11	15.09	13.78
K Bahar	90.00	12.68	11.21	16.29
K Khyati	80.37	20.72	17.43	14.65
K Pukhraj	84.81	15.81	14.50	15.91
K Laukar	80.37	17.74	17.06	16.79
K Garima	89.26	18.15	16.04	16.09
K Lalit	78.89	13.93	11.96	15.92
SEd	3.47	1.68	1.72	1.61
CD (0.05)	7.17	3.47	3.56	NS
CV (%)	5.18	12.90	14.95	13.00

**Table 71:** Emergence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 & 90 days crop.

Hybrid/variety	Emergence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Dry matter (%)	75 days		90 days	
					Emergence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Dry matter (%)
J/6-182	78.52	18.76	14.54	17.00	78.52	26.24	21.59	19.12
MS/8-1148	80.00	19.93	15.65	17.58	80.00	27.82	23.45	18.96
MS/9-723	80.00	20.00	14.04	17.18	80.00	26.13	18.63	19.75
MS/9-2196	83.70	25.39	21.22	16.14	83.70	29.28	25.72	17.97
J/7-37	80.74	25.70	22.61	16.94	80.74	27.43	24.08	17.80
MS/7-645	77.78	21.18	16.18	15.49	77.78	26.83	21.74	17.02
J/2-14	86.30	22.74	17.19	16.76	86.30	31.13	26.43	17.54
K Mohan	78.89	21.71	18.11	15.88	78.89	27.07	23.89	16.40
K Bahar	90.00	21.46	18.96	18.89	90.00	32.24	28.87	20.14
K Khyati	80.37	25.54	20.35	17.61	80.37	27.67	22.48	18.52
K Pukhraj	84.81	28.92	24.85	16.26	84.81	31.06	25.67	18.72
K Laukar	80.37	24.42	22.44	17.31	80.37	27.32	23.96	19.22
K Garima	89.26	24.11	19.28	17.11	89.26	32.29	28.22	18.15
K Lalit	78.89	19.24	14.56	16.21	78.89	26.02	21.48	18.43
SEd	3.47	2.19	1.90	0.89	3.47	2.78	2.69	0.67
CD (0.05)	7.17	4.53	3.92	NS	7.17	NS	5.55	1.39
CV (%)	5.18	11.77	12.52	6.46	5.18	11.98	13.70	4.47

## HISAR

**Table 72:** Plant emergence (%), Seed Wt.(t/ha), total and marketable tuber yield (t/ha) in 60 & 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	60 days		75 days	
					Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)
J/6-182	95.94	4.03	26.72	18.53	97.72	3.87	29.12	20.24
MS/8-1148	96.96	3.58	20.11	11.42	96.47	3.27	24.64	17.04
MS/9-723	97.14	3.34	9.99	7.98	97.59	3.23	22.01	17.98
MS/9-2196	94.72	3.59	23.59	16.93	96.85	3.48	22.78	18.87
J/7-05	93.89	4.22	20.01	16.40	94.07	3.58	21.84	18.88

J/7-15	95.64	4.42	17.25	15.97	95.47	3.35	22.64	19.05
J/7-37	97.29	4.03	21.53	12.64	96.62	3.40	25.39	20.63
MCIP/9-11	94.73	3.87	14.33	12.24	94.23	3.37	22.11	20.62
K Bahar	97.72	3.56	18.80	16.18	98.32	3.49	25.94	23.01
K Khyati	96.47	4.12	25.70	22.28	94.69	4.03	28.68	26.36
K Pukhraj	97.59	3.60	25.73	21.64	97.55	3.58	33.86	30.60
K Sadabahar	96.85	3.41	15.15	11.10	96.07	3.34	20.56	17.22
K Gaurav	94.07	3.69	12.88	9.50	95.55	3.59	18.86	16.01
K Mohan	95.47	4.15	24.96	22.13	95.64	4.22	29.70	26.27
K Lalit	96.62	4.31	21.44	18.23	95.70	4.42	27.31	23.91
K Lalima	94.70	4.03	13.36	10.30	94.27	4.03	22.85	20.16
K Garima	94.23	3.80	18.04	15.02	96.67	3.87	29.37	25.57
SEd	1.63	0.10	1.76	1.77	1.81	0.13	2.39	2.52
CD (0.05)	NS	0.21	3.60	3.63	NS	0.26	4.89	5.16
CV (%)	2.08	3.26	11.12	14.29	2.31	4.22	11.64	14.49

**Table 73:** Plant emergence (%), Seed Wt.(t/ha), total & marketable tuber yield (t/ha) in 90 days and dry matter (%) in 60, 75 & 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)		
					60 days	75 days	90 days
J/6-182	98.32	4.12	31.34	29.26	14.50	15.30	15.70
MS/8-1148	94.69	3.60	50.19	36.72	12.20	13.60	17.20
MS/9-723	97.55	3.41	41.04	36.54	11.70	13.80	16.90
MS/9-2196	96.07	3.69	42.80	38.23	12.00	13.00	16.00
J/7-05	95.55	4.15	42.49	36.08	12.40	14.00	14.80
J/7-15	95.64	4.31	41.51	38.26	15.10	15.30	15.60
J/7-37	95.70	4.03	42.76	38.37	13.00	14.60	14.80
MCIP/9-11	96.67	3.80	37.20	35.19	14.10	15.10	15.70
K Bahar	95.94	3.70	33.22	30.50	15.10	15.60	16.00
K Khyati	96.96	3.92	30.29	25.95	11.90	14.50	14.60
K Pukhraj	97.14	3.99	34.79	31.43	13.90	15.80	18.60
K Sadabahar	94.72	4.07	23.40	22.22	13.00	15.30	15.60
K Gaurav	93.89	3.70	30.31	27.85	12.70	13.00	14.90
K Mohan	95.64	3.66	35.07	34.52	10.90	14.70	15.90
K Lalit	97.29	3.28	36.10	30.80	14.50	16.30	18.70
K Lalima	94.93	3.70	37.98	33.18	15.00	15.70	16.30
K Garima	94.73	3.94	36.95	35.57	13.00	16.00	17.60
SEd	1.72	0.21	2.75	2.59			
CD (0.05)	NS	0.42	5.63	5.30			
CV (%)	2.19	6.57	9.14	9.62			

**Table 74:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	60 days			75 days			90 days		
J/6-182	Did not appear		0.9	Did not appear		1.8	Did not appear		2.9
MS/8-1148			1.5			1.9			4.1
MS/9-723			1.0			1.8			3.4
MS/9-2196			0.0			0.9			1.4
J/7-05			1.2			2.9			4.5
J/7-15			0.8			1.2			3.4
J/7-37			1.4			2.6			3.5
MCIP/9-11			1.2			1.4			2.0
K Bahar			0.0			0.0			0.0
K Khyati			1.2			2.0			4.0
K Pukhraj			0.5			1.5			2.0

K Sadabahar		1.5		2.5		3.0
K Gaurav		1.0		1.5		2.0
K Mohan		0.5		1.5		2.0
K Lalit		0.8		1.5		2.0
K Lalima		0.0		0.5		1.0
K Garima		0.0		1.0		2.0

## JALANDHAR

**Table 75:** Plant emergence (%), seed wt.(t/ha), total and marketable tuber yield (t/ha) in 60 & 75 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)
MS/8-1148	91.00	5.68	19.45	17.90	93.33	5.74	33.96	31.85
MS/9-2196	89.67	5.80	25.00	23.46	93.33	5.74	41.42	38.33
MCIP/9-11	93.33	6.05	23.09	21.60	95.00	6.17	36.67	33.71
K Bahar	94.00	5.93	16.73	15.50	93.33	6.48	27.97	26.48
K Khyati	93.33	6.36	22.29	20.99	92.33	6.48	37.10	35.99
K Pukhraj	94.00	5.74	21.67	20.56	92.33	5.87	36.67	33.83
SEd	2.08	0.30	0.53	0.58	2.13	0.26	0.65	0.72
CD (0.05)	NS	NS	1.20	1.32	NS	0.58	1.46	1.62
CV (%)	2.75	6.25	3.04	3.57	2.79	5.18	2.22	2.64

**Table 76:** Plant emergence (%), seed wt.(t/ha), total and marketable tuber yield (t/ha) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)
MS/8-1148	95.00	5.25	43.96	40.13
MS/9-2196	92.33	5.93	53.15	50.19
MCIP/9-11	92.67	5.99	48.71	45.25
K Bahar	93.33	6.17	37.78	35.99
K Khyati	91.67	6.36	48.77	46.98
K Pukhraj	92.00	5.93	49.08	46.61
SEd	2.25	0.21	1.02	1.16
CD (0.05)	NS	0.48	2.30	2.62
CV (%)	2.96	4.40	2.66	3.22

**Table 77:** Disease reraction

Hybrids	Late blight (%)	Leaf spot (%)	Viral Disease (%)	Late blight (%)	Leaf spot (%)	Viral Disease (%)	Late blight (%)	Leaf spot (%)	Viral Disease (%)
MS/8-1148	0	0	12	0	0	15	0	0	10
MS/9-2196	0	0	20	0	0	15	0	0	15
MCIP/9-11	0	0	11	0	0	10	0	0	10
K Bahar	0	0	13	0	0	15	0	0	15
K Khyati	0	0	10	0	0	10	0	0	10
K Pukhraj	0	0	10	0	0	10	0	0	10



## JORHAT

**Table 78:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	86.67	3.92	42.67	19.91	17.90	17.10
MS/8-1148	89.43	2.80	32.67	19.79	16.84	13.17
MS/9-723	88.33	3.91	32.67	22.31	20.24	17.97
MS/9-2196	86.67	3.06	24.00	18.33	15.94	16.13
J/7-05	90.00	2.74	32.67	19.61	14.64	12.90
J/7-15	93.33	3.99	29.00	19.93	15.81	18.43
J/7-37	91.67	3.96	32.67	20.29	16.84	14.80
PS/8-31	91.67	1.88	15.00	14.78	12.14	14.90
MCIP/9-11	86.67	1.88	25.00	19.90	18.46	15.90
K Khyati	95.00	1.36	24.00	19.40	17.26	16.20
K Pukhraj	95.00	4.55	15.00	18.47	17.66	18.37
SEd	3.89	0.31	1.47	0.44	0.76	0.49
CD (0.05)	NS	0.65	3.09	0.92	1.60	1.03
CV (%)	5.27	12.19	6.48	2.76	5.58	3.76

**Table 79:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	98.33	4.10	25.67	21.58	20.13	18.57
MS/8-1148	92.23	2.54	31.67	20.91	18.86	15.43
MS/9-723	100.00	4.20	24.00	23.37	21.53	16.17
MS/9-2196	95.57	3.78	20.00	18.60	17.32	13.90
J/7-05	93.33	2.61	10.00	22.32	15.39	16.43
J/7-15	90.57	3.51	29.00	21.32	17.74	15.93
J/7-37	93.33	4.17	27.00	22.83	15.54	17.10
PS/8-31	93.33	1.70	19.00	16.49	13.17	16.67
MCIP/9-11	95.00	2.22	29.00	20.88	17.92	17.30
K Khyati	91.67	1.48	10.00	19.74	16.05	52.27
K Pukhraj	96.67	4.55	35.00	19.28	17.95	16.17
SEd	4.52	0.44	0.99	0.36	0.80	14.05
CD (0.05)	NS	0.93	2.07	0.76	1.68	NS
CV (%)	5.85	17.03	5.10	2.15	5.62	87.68

**Table 80:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	95.00	3.19	39.00	23.87	18.78	20.17
MS/8-1148	88.33	2.60	34.00	22.03	18.89	17.80
MS/9-723	90.00	3.51	24.00	23.94	15.63	16.37
MS/9-2196	94.00	3.58	27.00	19.45	15.93	14.67
J/7-05	87.67	3.25	29.00	23.69	14.61	17.60
J/7-15	90.00	3.68	35.00	21.62	13.12	16.43
J/7-37	94.00	4.00	34.00	23.67	13.48	18.10
PS/8-31	91.33	1.84	24.00	16.68	12.21	18.87
MCIP/9-11	87.67	1.82	34.00	21.88	14.26	18.50
K Khyati	95.67	1.15	26.33	21.14	12.72	19.33
K Pukhraj	88.33	3.75	34.00	19.83	15.32	18.93
SEd	2.75	0.26	0.86	0.25	0.95	0.46

CD (0.05)	5.78	0.54	1.81	0.52	1.99	0.97
CV (%)	3.70	10.75	3.41	1.41	7.72	3.16

**Table 81:** Disease reaction

Hybrids/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
	J/6-182	3.0	0.0	9.0	5.0	0.0	11.0	7.0	0.0
MS/8-1148	2.0	0.0	11.0	4.0	0.0	12.5	6.0	0.0	13.5
MS/9-723	1.5	0.0	10.5	2.0	0.0	12.0	3.0	0.0	13.0
MS/9-2196	6.0	0.0	12.0	7.5	0.0	13.5	9.0	0.0	14.5
J/7-05	3.5	0.0	7.5	4.0	0.0	9.0	4.5	0.0	11.0
J/7-15	4.0	0.0	8.0	5.5	0.0	9.5	6.0	0.0	11.0
J/7-37	3.0	0.0	6.5	4.5	0.0	7.5	5.5	0.0	9.0
PS/8-31	4.0	0.0	8.0	5.0	0.0	9.0	6.0	0.0	10.0
MCIP/9-11	5.3	0.0	9.0	6.0	0.0	10.0	7.0	0.0	11.0
K Khyati	4.0	0.0	11.0	5.0	0.0	12.5	6.5	0.0	14.0
K Pukhraj	3.0	0.0	12.5	4.0	0.0	14.0	5.0	0.0	14.5

#### KALYANI

**Table 82:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	100.00	2.25	21.48	20.44	18.33
MS/8-1148	97.33	2.17	24.54	23.50	19.66
MS/9-723	89.33	2.39	8.92	8.05	16.49
MS/9-2196	91.33	2.39	14.39	13.48	16.29
K Ashoka	96.67	2.63	23.67	22.28	16.25
K Khyati	98.67	3.17	30.90	29.90	19.62
K Pukhraj	96.67	3.27	23.17	22.07	14.41
K Lalima	98.67	2.79	24.56	23.21	16.19
K Lalit	99.33	2.47	22.95	21.87	18.86
K Jyoti	95.33	3.12	14.12	12.91	17.23
SEd	1.21	0.08	1.98	1.99	0.37
CD (0.05)	2.57	0.16	4.19	4.22	0.79
CV (%)	1.54	3.56	11.62	12.34	2.64

**Table 83:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	99.33	2.23	49.33	28.62	27.66	19.95
MS/8-1148	97.33	2.11	5.43	35.17	34.25	20.11
MS/9-723	90.00	2.33	0.00	20.45	19.10	17.26
MS/9-2196	94.67	2.41	66.67	20.45	19.90	17.07
K Ashoka	97.67	2.59	51.67	27.78	26.89	17.36
K Khyati	96.00	3.17	61.67	33.01	32.05	19.96
K Pukhraj	97.33	3.07	53.33	28.06	27.51	16.31
K Lalima	98.67	2.75	0.00	32.56	31.97	18.51
K Lalit	99.67	2.50	80.00	35.84	34.50	20.61
K Jyoti	97.67	2.98	18.33	20.45	19.58	18.48
SEd	0.85	0.09	2.03	1.73	1.77	0.46
CD (0.05)	1.79	0.19	4.29	3.65	3.75	0.97
CV (%)	1.07	4.11	6.42	7.49	7.94	3.01

**Table 84:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
J/6-182	97.33	2.25	63.33	31.67	30.67	21.02
MS/8-1148	99.33	2.17	81.67	40.40	39.55	21.14
MS/9-723	92.67	2.39	18.33	24.11	23.47	18.86
MS/9-2196	96.67	2.39	71.67	22.84	22.14	18.40
K Ashoka	97.67	2.63	81.67	32.34	31.48	18.71
K Khyati	98.67	3.17	73.33	35.39	34.37	21.09
K Pukhraj	97.33	3.27	70.00	37.01	36.17	16.56
K Lalima	99.00	2.79	21.67	32.06	31.32	19.85
K Lalit	98.67	2.47	88.33	38.62	37.34	20.96
K Jyoti	91.33	3.06	71.67	22.73	21.68	20.04
SEd	0.72	0.08	2.68	2.08	2.19	0.38
CD (0.05)	1.53	0.18	5.67	4.40	4.64	0.81
CV (%)	0.92	3.85	5.11	8.03	8.72	2.39

**Table 85:** Disease rereaction

Hybrids	Late blight (%)	Leaf spot (%)	Viral Disease (%)	Late blight (%)	Leaf spot (%)	Viral Disease (%)	Late blight (%)	Leaf spot (%)	Viral Disease (%)	
	60 days			75 days			90 days			
J/6-182	Did not Appear	4	6	DNA	5.25	7.05	9.45	7.55	11	
MS/8-1148		Did not Appear	Did not Appear	DNA	10.5	Did not Appear	8.25	12.75	Did not Appear	10.25
MS/9-723				5.5	DNA	7	8.6	9.3		
MS/9-2196				6.45	9.2	5.75	8.25	11.85	6.4	11.55
K Ashoka				8.25	DNA	Did not Appear	11	11	DNA	12.25
K Khyati				5.65	8	7035	9.75	6.5	9	
K Pukhraj				7.5	DNA	5.25	10	10.5	6	11.2
K Lalima				DNA	10	Did not Appear	9.4	13.2	7.5	10.65
K Lalit				7.25	DNA	8.6	9.5	DNA	10.75	
K Jyoti				8	7045	6.85	12	10.5	8.25	13.35

DNA= Did not Appear

#### KANPUR

**Table 86:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
MS/8-1148	55.00	3.30	7.68	10.66	7.47	9.53
MS/9-723	34.50	3.06	5.00	6.95	6.08	10.38
MS/9-2196	58.50	3.20	7.78	10.80	9.31	9.48
J/7-05	10.75	2.89	1.40	1.95	1.60	10.45
J/7-37	54.75	3.37	8.28	11.50	10.11	9.40
K Bahar	95.00	2.50	6.83	9.48	7.88	10.98
K Khyati	87.50	3.61	10.48	14.55	11.67	9.50
K Pukhraj	92.00	3.89	15.73	21.84	20.25	10.30
K Garima	80.50	3.06	10.18	14.13	11.18	9.40
K Mohan	72.75	2.78	7.83	10.87	9.86	8.53
K Lalit	81.50	2.92	10.83	15.04	12.67	7.40
K Lalima	87.25	3.02	8.58	11.91	9.03	8.30
SEd	6.01	0.27	1.68	2.33	2.25	0.23
CD (0.05)	12.29	0.55	3.42	4.75	4.59	0.46
CV (%)	12.60	12.13	28.26	28.27	32.58	3.39

**Table 87:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
MS/8-1148	54.75	3.89	10.88	15.11	10.91	13.20
MS/9-723	35.00	3.65	7.88	10.94	7.92	14.33
MS/9-2196	60.00	3.33	15.38	21.36	17.19	13.53
J/7-05	9.00	3.47	2.55	3.54	3.02	15.33
J/7-37	54.00	3.54	14.70	20.42	16.15	14.43
K Bahar	96.00	2.67	16.00	17.82	14.90	15.30
K Khyati	91.00	3.61	18.10	22.23	17.78	12.03
K Pukhraj	93.75	3.89	12.83	25.14	21.29	12.18
K Garima	81.75	3.30	15.00	20.84	17.61	12.93
K Mohan	75.00	2.95	14.93	20.73	17.16	13.58
K Lalit	84.00	3.26	12.00	16.67	13.72	12.65
K Lalima	88.75	3.33	16.53	22.95	18.72	12.08
SEd	5.50	0.26	1.73	2.40	2.30	0.22
CD (0.05)	11.25	0.52	3.53	4.91	4.71	0.46
CV (%)	11.35	10.57	18.72	18.73	22.17	2.35

**Table 88:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	weight (t/ha) of rotten tubers	Dry matter (%)
MS/8-1148	51.75	3.96	12.88	17.89	13.20	0.59	20.05
MS/9-723	36.25	3.54	9.75	13.54	11.04	0.39	20.90
MS/9-2196	61.25	3.68	23.48	32.61	28.89	0.66	18.95
J/7-05	11.50	3.68	3.15	4.38	1.67	0.87	19.50
J/7-37	55.50	3.68	21.93	30.46	26.88	0.97	21.65
K Bahar	92.50	3.13	14.50	20.14	16.98	0.49	21.63
K Khyati	89.50	3.54	21.60	30.00	26.26	0.83	19.58
K Pukhraj	94.25	3.79	26.08	36.22	31.60	0.73	18.60
K Garima	83.75	3.30	22.65	31.46	26.22	0.56	22.55
K Mohan	75.50	3.02	19.25	26.74	21.11	0.63	19.60
K Lalit	82.50	3.13	15.90	22.09	17.85	2.98	15.58
K Lalima	88.00	3.27	20.60	28.62	22.99	0.63	21.85
SEd	5.49	0.19	1.77	2.46	2.33	0.92	2.04
CD (0.05)	11.21	0.38	3.62	5.03	4.77	NS	NS
CV (%)	11.32	7.52	14.22	14.21	16.18	152.16	14.38

**Table 89:** Disease reaction

Hybrids/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
MS/8-1148	0	0	0	0	0	0	15	10	8
MS/9-723	0	0	0	0	0	0	14	12	6
MS/9-2196	0	0	0	0	0	0	14	10	7
J/7-05	0	0	0	0	0	0	12	8	6
J/7-37	0	0	0	0	0	0	12	10	9
K Bahar	0	0	0	0	0	0	15	12	9
K Khyati	0	0	0	0	0	0	12	8	6
K Pukhraj	0	0	0	0	0	0	13	11	7
K Garima	0	0	0	0	0	0	13	10	6
K Mohan	0	0	0	0	0	0	12	9	7
K Lalit	0	0	0	0	0	0	15	13	10
K Lalima	0	0	0	0	0	0	12	9	8

## KOTA

**Table 90:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber Dry matter (%)
MS/8-1148	93.25	5.21	85.00	16.61	15.42	0.86	19.88
K Bahar	94.58	4.25	87.50	16.25	15.00	1.17	20.30
K Khyati	91.83	5.10	87.50	19.00	17.08	1.00	20.18
K Pukhraj	92.62	4.39	90.00	15.64	14.31	1.00	19.28
K Garima	92.08	4.08	87.50	14.22	12.92	1.61	19.45
SEd	1.99	0.41	2.14	0.46	0.39	0.17	0.24
CD (0.05)	NS	NS	NS	1.02	0.86	0.37	0.52
CV (%)	3.04	12.50	3.46	3.99	3.70	21.06	1.68

**Table 91:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	90 days		
MS/8-1148	0	0.00	6.00
K Bahar	0	2.00	9.00
K Khyati	0	0.00	2.00
K Pukhraj	0	0.00	13.00
K Garima	0	4.50	10.00

## MODIPURAM

**Table 92:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber Dry matter (%)
J/6-182	88.89	5.39	2.50	19.83	17.45	15.06
MS/8-1148	92.22	6.11	2.17	14.57	10.13	13.37
MS/9-723	90.00	6.76	2.00	13.36	10.11	13.47
MS/9-2196	92.78	6.81	2.33	19.35	16.11	13.26
J/7-05	85.00	5.56	2.33	17.06	14.49	14.44
J/7-15	90.00	5.93	2.17	22.72	20.49	14.50
J/7-37	90.00	5.88	2.50	16.81	15.02	13.39
MCIP/9-11	89.45	3.12	2.50	10.12	8.04	13.87
K Bahar	92.78	4.79	2.50	17.15	14.34	14.90
K Khyati	92.78	5.32	2.00	18.62	15.35	12.50
K Pukhraj	91.67	5.09	2.33	15.39	12.58	13.39
K Sadabahar	91.11	5.60	2.33	16.47	14.76	13.86
K Gaurav	83.89	4.29	2.00	12.73	9.05	13.60
K Mohan	91.11	4.91	2.00	18.16	15.02	12.92
K Lalit	89.44	4.67	2.50	14.65	12.15	15.01
K Garima	90.00	5.83	2.00	15.28	12.43	14.09
SEd	2.18	0.66	0.14	0.91	0.87	0.31
CD (0.05)	4.47	1.35	0.30	1.86	1.78	0.64
CV (%)	2.96	14.95	7.78	6.77	7.83	2.77

**Table 93:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber Dry matter (%)
J/6-182	90.56	7.25	3.00	38.51	34.86	16.23
MS/8-1148	92.22	5.84	2.83	32.56	26.38	14.57
MS/9-723	93.89	6.02	2.50	30.11	26.56	13.64
MS/9-2196	95.00	6.02	3.07	42.57	37.92	14.67
J/7-05	82.78	6.34	3.00	30.45	26.69	14.71
J/7-15	89.44	5.83	2.67	32.73	28.77	15.14
J/7-37	90.56	5.93	3.00	37.42	35.07	14.51
MCIP/9-11	92.78	2.78	3.33	25.43	23.44	15.27
K Bahar	93.33	4.75	3.17	35.44	32.12	17.81
K Khyati	92.78	6.02	3.00	40.94	36.40	13.73
K Pukhraj	90.56	4.91	3.00	39.09	35.04	14.61
K Sadabahar	90.00	5.53	3.00	30.04	27.18	15.93
K Gaurav	82.78	2.98	2.50	28.30	23.37	14.25
K Mohan	92.78	4.58	2.50	41.64	36.77	13.13
K Lalit	90.55	4.35	3.00	31.62	27.77	15.54
K Garima	90.00	5.43	2.77	37.10	33.67	15.60
SEd	2.98	0.47	0.13	0.92	1.02	0.31
CD (0.05)	6.11	0.96	0.27	1.89	2.10	0.63
CV (%)	4.02	10.87	5.48	3.25	4.07	2.53

**Table 94:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber Dry matter (%)
J/6-182	92.22	6.39	3.33	41.98	37.80	18.97
MS/8-1148	93.89	6.25	3.23	51.38	43.94	15.54
MS/9-723	90.56	6.53	3.17	53.08	47.74	16.11
MS/9-2196	98.89	6.44	3.23	53.78	47.36	15.67
J/7-05	81.67	6.07	3.33	45.52	42.28	17.00
J/7-15	90.00	5.74	3.40	44.30	42.43	18.31
J/7-37	87.22	5.46	3.13	47.37	45.11	15.27
MCIP/9-11	97.22	3.50	3.53	34.44	32.78	17.31
K Bahar	97.22	4.90	3.63	44.54	41.18	18.20
K Khyati	95.56	6.39	3.27	53.30	48.67	15.64
K Pukhraj	90.00	4.77	3.53	49.38	45.89	16.32
K Sadabahar	90.00	5.10	3.17	35.92	32.21	16.17
K Gaurav	87.78	2.98	3.00	42.80	37.11	15.67
K Mohan	90.55	4.26	3.00	53.53	48.53	13.66
K Lalit	88.89	4.91	3.17	45.53	40.64	16.09
K Garima	95.56	5.09	3.00	42.55	36.77	16.79
SEd	4.03	0.50	0.16	1.16	1.28	0.32
CD (0.05)	8.27	1.02	0.34	2.38	2.63	0.65
CV (%)	5.38	11.53	6.18	3.08	3.75	2.35

**Table 95:** Total weight loss after 3 months storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage Weight basis	Total wt. Losses (%)
		At 6 weeks	End of storage ( 75days)			
J/6-182	> 6 weeks	30.41	54.54	0.31	4.64	24.61
MS/8-1148	> 6 weeks	5.75	27.74	0.06	1.18	9.18
MS/9-723	> 6 weeks	0.00	41.66	0.02	4.59	11.76
MS/9-2196	> 6 weeks	29.11	51.90	0.08	7.46	16.14

J/7-05	> 6 weeks	28.13	43.09	0.34	9.90	24.70
J/7-15	> 6 weeks	20.92	20.92	0.06	6.44	13.95
J/7-37	> 6 weeks	0.00	14.23	0.02	6.49	13.89
MCIP/9-11	> 6 weeks	0.00	0.00	0.00	6.52	15.51
K Bahar	> 6 weeks	87.81	87.81	0.11	0.44	12.74
K Khyati	> 6 weeks	0.00	3.38	0.01	8.30	14.23
K Pukhraj	> 6 weeks	12.36	46.12	0.10	0.52	9.52
K Sadabahar	> 6 weeks	70.46	70.46	0.41	1.55	12.32
K Gaurav	> 6 weeks	0.00	57.63	0.10	9.79	16.92
K Mohan	> 6 weeks	0.00	49.00	0.04	0.61	15.32
K Lalit	> 6 weeks	7.48	12.08	0.02	4.34	11.41
K Garima	> 6 weeks	12.43	23.91	0.03	1.01	17.95

## PASIGHAT

**Table 96:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
MS/8-1148	75.93	2.45	72.00	30.56	28.71	1.85	20.34
K Ashoka	81.47	2.41	69.00	31.02	29.35	1.62	21.84
K Khyati	84.47	2.45	74.33	35.65	34.49	1.16	19.81
K Pukhraj	87.07	2.22	79.00	31.49	29.86	1.62	22.61
K Lalima	95.57	2.50	68.00	35.19	32.41	2.78	19.82
K Jyoti	94.80	2.36	71.00	29.17	28.01	1.16	19.88
SEd	1.83	0.27	3.43	2.16	1.85	0.64	0.69
CD (0.05)	4.12	NS	NS	NS	4.17	NS	1.55
CV (%)	2.59	13.68	5.82	8.23	7.43	45.85	4.05

**Table 97:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
MS/8-1148	76.13	2.36	76.67	34.73	32.64	2.08	20.45
K Ashoka	82.33	2.36	84.33	28.71	27.32	1.39	20.23
K Khyati	86.70	2.50	88.67	34.73	33.57	1.16	19.74
K Pukhraj	88.33	2.18	85.67	32.41	30.79	2.08	21.33
K Lalima	95.57	2.27	85.33	32.87	30.79	2.08	19.76
K Jyoti	93.13	2.45	85.67	30.56	28.94	1.62	20.02
SEd	1.44	0.28	4.96	3.07	1.90	0.62	0.71
CD (0.05)	3.25	NS	NS	NS	NS	NS	NS
CV (%)	2.03	14.67	7.20	11.62	7.58	43.90	4.30

**Table 98:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
MS/8-1148	76.03	2.31	84.33	37.04	35.42	1.62	20.41
K Ashoka	82.47	2.36	92.00	31.02	29.40	1.62	20.77
K Khyati	83.73	2.50	93.33	34.73	33.57	1.16	20.21
K Pukhraj	86.70	2.27	86.67	31.95	32.41	2.31	22.77
K Lalima	95.20	2.55	92.33	33.80	31.72	1.85	21.18
K Jyoti	94.80	2.31	94.67	32.41	30.79	1.62	20.08

SEd	1.63	0.29	3.00	3.26	3.64	0.41	0.72
CD (0.05)	3.69	NS	6.78	NS	NS	NS	1.62
CV (%)	2.31	14.67	4.06	11.91	13.85	29.62	4.20

**Table 99:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	60 days			75 days			90 days		
MS/8-1148	4.2	5.5	4	5.3	4.8	4.2	4.8	5.2	3.5
K Ashoka	5.1	4.6	5.2	4.7	5.1	6.1	5.3	4.9	5.2
K Khyati	3.2	3.5	4.1	5	4	4	4.8	4.3	4.3
K Pukhraj	4.5	5.1	4.9	4.3	4.5	4.6	4.4	4.1	5.2
K Lalima	4.8	4.9	4.3	5.7	6.2	5.1	5.3	5.5	4.7
K Jyoti	5	5.3	4.2	4.5	4.8	4.9	5	5	5.2

**Table 100:** Total weight loss after 3 months storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (90 days)		Number basis	Weight basis	
MS/8-1148	> 6 weeks	0.0	5.1	2.2	11.5	7.2	9.2
K Ashoka	> 6 weeks	0.0	6.9	2.8	12.0	7.8	9.6
K Khyati	> 6 weeks	0.0	5.3	1.7	9.2	6.7	7.4
K Pukhraj	> 6 weeks	0.0	6.6	2.6	10.5	7.5	8.7
K Lalima	> 6 weeks	0.0	5.9	1.9	11.0	7.3	10.2
K Jyoti	> 6 weeks	0.0	6.8	2.7	11.2	7.5	11.5

## PATNA

**Table 101:** Plant emergence (%), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
MS/8-1148	90.03	23.07	25.82	26.14	16.50
PS/8-31	89.17	22.33	26.29	25.52	17.27
K Ashoka	86.00	28.33	26.23	22.26	15.07
K Khyati	82.33	17.67	25.75	23.09	16.83
K Pukhraj	85.00	17.33	33.99	27.09	16.30
K Lalima	84.67	17.00	26.16	22.17	17.17
K Lalit	85.33	18.33	25.75	25.34	17.50
K Mohan	83.00	17.67	21.46	19.45	16.40
K Jyoti	85.33	32.33	26.27	25.75	16.93
SEd	1.38	1.47	0.55	0.61	0.30
CD (0.05)	2.94	3.14	1.19	1.31	0.64
CV (%)	1.97	8.34	2.57	3.11	2.19

**Table 102:** Plant emergence (%), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
MS/8-1148	93.43	52.67	31.69	28.40	17.20
PS/8-31	93.00	32.33	29.03	26.64	17.70
K Ashoka	89.67	37.33	27.09	25.13	16.50



K Khyati	88.67	26.67	26.78	25.03	17.07
K Pukhraj	90.00	29.67	35.84	31.21	17.43
K Lalima	88.00	25.67	28.33	25.85	18.23
K Lalit	90.00	28.67	28.74	26.27	19.17
K Mohan	90.33	25.33	27.89	24.59	18.07
K Jyoti	92.00	38.67	28.84	25.75	17.77
SEd	1.41	10.14	0.81	0.74	0.41
CD (0.05)	3.01	NS	1.73	1.58	0.87
CV (%)	1.90	37.62	3.37	3.42	2.83

**Table 103:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)		
	75 days			90 days				
MS/8-1148	Did not appear	Did not appear	2	Did not appear	Did not appear	3		
PS/8-31			3			4		
K Ashoka			Did not appear			Did not appear	Did not appear	Did not appear
K Khyati								
K Pukhraj								
K Lalima								
K Lalit			3			4		
K Mohan			Did not appear			Did not appear	Did not appear	Did not appear
K Jyoti								

**Table 104:** Total weight loss after 3 months storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (90 days)		Number basis	Weight basis	
MS/8-1148	< 6 weeks	4.75	0.00	0.00	44.29	46.79	53.27
PS/8-31	> 6 weeks	0.00	0.00	0.00	43.78	45.51	53.03
K Ashoka	< 6 weeks	2.40	0.00	0.00	46.22	47.56	54.21
K Khyati	< 6 weeks	13.22	0.00	0.00	47.54	49.88	56.50
K Lalima	> 6 weeks	0.00	0.00	0.00	45.70	50.54	57.10
K Pukhraj	< 6 weeks	18.17	8.77	0.15	55.06	59.49	70.26
K Mohan	< 6 weeks	2.40	0.00	0.00	51.79	55.98	65.62
K Jyoti	> 6 weeks	0.00	0.00	0.00	45.49	47.50	55.10
K Lalit	< 6 weeks	0.94	0.00	0.00	45.41	47.24	53.85

**PUNE**

**Table 105:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
J/6-182	95.33	3.69	65.67	10.82	9.89	0.93	16.27
MS/8-1148	94.11	3.39	67.00	12.28	11.13	1.15	17.11
MS/9-723	94.00	3.52	67.00	10.89	9.41	1.48	17.25
MS/9-2196	93.00	3.44	71.67	10.61	9.27	1.33	16.82
J/7-15	94.00	3.61	65.00	10.76	9.15	1.61	17.62
MCIP/9-11	94.67	4.19	65.00	13.46	11.89	1.58	18.15
K Pukhraj	94.89	3.50	67.00	12.37	11.20	1.17	16.12
SEd	1.42	0.19	1.35	0.72	0.70	0.07	0.14
CD (0.05)	NS	0.41	2.98	1.58	1.55	0.15	0.31
CV (%)	1.84	6.28	2.48	7.58	8.36	6.21	1.02

**Table 106:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
J/6-182	94.22	3.55	72.93	12.63	11.48	1.15	16.70
MS/8-1148	94.22	3.37	70.67	14.39	13.07	1.31	17.58
MS/9-723	92.11	3.52	79.33	11.87	10.22	1.65	17.75
MS/9-2196	90.67	3.56	73.67	11.93	10.39	1.54	17.65
J/7-15	93.33	3.33	72.33	12.04	10.28	1.76	18.52
MCIP/9-11	93.00	3.81	74.67	15.18	13.48	1.70	18.85
K Pukhraj	95.10	3.41	75.50	14.15	12.76	1.39	16.67
SEd	1.29	0.20	1.02	0.48	0.49	0.06	0.11
CD (0.05)	NS	NS	2.25	1.05	1.07	0.14	0.24
CV (%)	1.70	7.01	1.69	4.45	5.10	5.02	0.75

**Table 107:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
J/6-182	8.0	28.0	6.7	8.0	29.3	6.7
MS/8-1148	10.7	32.0	9.3	14.7	32.0	10.7
MS/9-723	12.0	25.3	5.3	13.3	22.7	5.3
MS/9-2196	16.0	34.7	5.3	17.3	38.7	6.7
J/7-15	9.3	29.3	2.7	12.0	29.3	5.3
MCIP/9-11	8.0	25.3	4.0	9.3	30.7	4.0
K Pukhraj	8.0	29.3	4.0	9.3	36.0	6.7

**Table 108:** Total weight loss after 3 months storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (90 days)		Number basis	Weight basis	
J/6-182	> 6 weeks	0.0	0.0	0.0	3.6	2.6	12.4
MS/8-1148	> 6 weeks	0.0	0.0	0.0	1.8	1.2	9.9
MS/9-723	> 6 weeks	0.0	0.0	0.0	5.2	4.1	14.3
MS/9-2196	> 6 weeks	0.0	0.0	0.0	7.2	6.3	15.2
J/7-15	> 6 weeks	0.0	0.0	0.0	7.1	6.2	15.1
MCIP/9-11	> 6 weeks	0.0	0.0	0.0	2.1	1.5	10.1
K Pukhraj	> 6 weeks	0.0	0.0	0.0	7.3	6.5	16.1

## RAIPUR

**Table 109:** Plant emergence (%), seed wt.(t/ha), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
J/6-182	89.59	5.14	23.34	14.21	0.28	19.18
MS/8-1148	74.58	5.72	13.19	7.79	0.10	19.08
J/7-05	70.83	5.12	10.15	5.82	0.05	18.70
J/7-37	90.00	6.53	28.57	24.29	0.05	19.16
K Bahar	90.00	5.72	11.16	8.46	0.14	17.10
K Khyati	90.42	4.93	20.99	13.47	0.22	18.13
K Pukhraj	90.00	6.22	27.64	17.36	1.25	18.90
K Laukar	89.58	4.95	19.17	13.59	1.87	18.16

K Garima	91.25	5.33	12.58	8.45	0.54	18.62
SEd	2.24	0.47	0.45	0.30	0.15	0.06
CD (0.05)	4.64	0.97	0.92	0.61	0.31	0.12
CV (%)	3.67	11.98	3.40	3.31	42.26	0.43

**Table 110:** Foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/ variety	Foliage senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Wt of rotten tubers (t/ha)	Dry matter (%)					
						Foliage senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Wt of rotten tubers (t/ha)	Dry matter (%)
	75 days					90 days				
J/6-182	19.50	26.91	19.15	0.44	20.17	75.50	27.10	18.79	0.38	21.17
MS/8-1148	17.00	16.90	11.65	0.19	19.74	79.00	18.12	12.96	0.20	20.07
J/7-05	20.50	12.18	8.92	0.80	19.06	80.50	17.99	13.03	0.52	20.64
J/7-37	17.50	34.45	29.37	0.51	20.24	84.25	35.35	31.71	0.66	21.03
K Bahar	18.50	18.27	12.87	0.57	19.55	82.00	29.42	21.77	0.18	20.63
K Khyati	21.25	25.96	19.81	0.43	19.83	85.25	27.59	22.33	0.46	20.66
K Pukhraj	21.50	29.44	20.05	1.58	19.11	75.00	31.11	24.41	0.69	20.10
K Laukar	21.25	22.64	17.06	1.14	19.04	82.75	25.96	20.22	0.34	20.16
K Garima	19.25	27.19	22.69	0.45	19.55	78.25	29.49	23.80	0.74	20.87
SEd	2.95	1.16	1.11	0.11	0.11	3.24	0.85	0.83	0.19	0.13
CD (0.05)	NS	2.41	2.30	0.23	0.23	6.73	1.77	1.72	0.39	0.27
CV (%)	21.31	6.89	8.74	23.42	0.81	5.71	4.47	5.59	56.81	0.89

**Table 111:** Disease reaction

Hybrid/ variety	Late blight (%)	Viral disease (%)	Wilt (%)	Late blight (%)	Viral disease (%)	Wilt (%)			
							Late blight (%)	Viral disease (%)	Wilt (%)
	60 days			75 days			90 days		
J/6-182	0	0	0	0	21	18	0	28	32
MS/8-1148	0	0	0	0	23	28	0	30	35
J/7-05	0	0	0	0	25	22	0	29	30
J/7-37	0	0	0	0	18	15	0	24	25
K Bahar	0	0	0	0	19	24	0	21	30
K Khyati	0	0	0	0	12	20	0	20	28
K Pukhraj	0	0	0	0	20	24	0	26	31
K Laukar	0	0	0	0	16	13	0	22	19
K Garima	0	0	0	0	13	17	0	27	24

**Table 112:** Total weight loss after 75 days storage at ambient temperature

Hybrid/ variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
J/6-182	> 6 weeks	Nil	Nil	0.0	0.0	35.1	36.7
MS/8-1148	> 6 weeks	Nil	Nil	0.0	0.0	20.6	22.2
J/7-05	> 6 weeks	Nil	Nil	0.0	0.0	44.9	46.6
J/7-37	> 6 weeks	Nil	Nil	0.0	0.0	43.8	45.4
K Bahar	> 6 weeks	Nil	Nil	0.0	0.0	49.8	51.4
K Khyati	> 6 weeks	Nil	Nil	0.0	0.0	23.7	25.8
K Pukhraj	> 6 weeks	Nil	Nil	0.0	0.0	48.0	49.2
K Laukar	> 6 weeks	Nil	Nil	0.0	0.0	36.0	37.2
K Garima	> 6 weeks	Nil	Nil	0.0	0.0	38.9	40.1

**POOLED OVER THE YEAR (2015-16 & 2016-17)**

**Table 112.1:** Yield (t/ha) performance under northern plains (HIS, JAL, MDP) at 75 days

Hybrid/ Control	HIS	JAL*	MDP	Mean C	HIS	JAL*	MDP	Mean C
	Total yield (t/ha)				Marketable yield (t/ha)			
J/6-182	30.46	40.20	33.65	34.77	24.23	37.97	30.58	30.93
MS/8-1148	23.10	39.02	34.79	32.30	18.45	36.90	29.05	28.13
K Bahar	26.89	36.90	34.80	32.86	24.81	35.61	31.20	30.54
K Khyati	28.83	43.56	37.97	36.78	26.85	42.12	33.97	34.31
K Pukhraj	30.08	43.20	38.78	37.35	27.69	41.16	34.74	34.53
Mean B	27.87	40.58	36.00		24.41	38.75	31.91	
CD	Location(B)=1.29; Genotype (C)=1.67; B X C=2.89				Location(B)=1.16; Genotype (C)=1.50; B X C=2.60			

\* MS/9-723 (2015-16) and MS/9-2196 (2016-17) in place of J/6-182

**Table 112.2:** Yield (t/ha) performance under northern plains (HIS, JAL, MDP) at 90 days

Hybrid/ Control	HIS	JAL*	MDP	Mean C	HIS	JAL*	MDP	Mean C
	Total yield (t/ha)				Marketable yield (t/ha)			
J/6-182	31.68	49.54	43.70	41.64	29.84	47.09	38.27	38.40
MS/8-1148	43.28	44.85	52.03	46.72	35.26	41.94	44.35	40.52
K Bahar	37.67	44.08	45.92	42.56	35.69	42.26	41.27	39.74
K Khyati	34.80	54.92	54.25	47.99	31.87	53.24	48.84	44.65
K Pukhraj	36.27	54.84	53.24	48.12	33.78	52.61	47.69	44.69
Mean B	36.74	49.65	49.83		33.29	47.43	44.08	
CD	Location (B)=1.85; Genotype (C)=2.39; B X C=4.13				Location (B)=1.74; Genotype (C)=2.24; B X C=3.88			

\* MS/9-723 (2015-16) and MS/9-2196 (2016-17) in place of J/6-182

**Table 112.3:** Yield (t/ha) performance under central plains (CHN, GWL, RPR) at 60 days

Hybrid/ Control	CHN	GWL	RPR	Mean C	CHN	GWL	RPR	Mean C
	Total yield (t/ha)				Marketable yield (t/ha)			
J/6-182	19.37	12.31	16.18	15.95	15.44	10.44	11.64	12.51
MS/8-1148	20.63	10.16	16.49	15.76	16.60	8.53	13.84	12.99
K Bahar	18.85	10.43	8.91	12.73	14.98	9.08	7.54	10.53
K Khayti	22.10	19.89	16.43	19.47	18.07	16.87	12.68	15.87
K Pukhraj	23.86	17.24	21.30	20.80	19.52	15.44	16.16	17.04
K Gaurav	23.94	16.00	14.09	18.01	19.48	14.10	12.02	15.20
Mean B	21.46	14.34	15.56		17.35	12.41	12.31	
CD	Location (B)=0.84; Genotype (C) = 1.19; B X C=2.06				Location (B) = 0.77; Genotype (C) = 1.09; B X C=1.88			

**Table 112.4:** Yield (t/ha) performance under central plains (CHN, DES, GWL, KAN\*, RPR) at 75 days

Hybrid/ Control	CHN	DES	GWL	KAN*	RPR	Mean C	CHN	DES	GWL	KAN*	RPR	Mean C
	Total yield (t/ha)						Marketable yield (t/ha)					
J/6-182	24.30	30.11	17.81	10.88	21.98	21.01	21.41	27.47	14.05	7.43	17.80	17.63
MS/8-1148	25.51	35.02	22.50	19.79	22.60	25.08	22.45	32.89	17.02	13.94	19.01	21.06
K Bahar	22.55	23.25	22.24	23.78	18.00	21.96	19.70	21.58	19.83	20.28	15.27	19.33
K Khyati	28.21	43.79	24.02	27.64	22.69	29.27	24.55	41.71	19.31	22.18	19.63	25.47
K Pukhraj	26.08	41.72	28.35	27.50	23.53	29.44	23.09	39.97	24.48	23.50	18.76	25.96
K Gaurav	28.45	32.53	23.19	23.48	20.89	25.70	25.18	30.28	19.25	19.75	18.49	22.59
Mean B	25.85	34.40	23.02	22.18	21.61		22.73	32.32	18.99	17.85	18.16	
CD	Location (B) = 1.44; Genotype (C) = 1.58; B X C=3.53						Location (B) = 1.37; Genotype (C) = 1.50; B X C=3.36					

\* PS/5-75 (2015-16) and MS/9-723 (2016-17) in place of J/6-182

**Table 112.5:** Yield (t/ha) performance under central plains (CHN, DES, GWL, KAN\*, RPR) at 90 days

Hybrid/ Control	CHN	DES	GWL	KAN*	RPR	Mean C	CHN	DES	GWL	KAN*	RPR	Mean C
	Total yield (t/ha)						Marketable yield (t/ha)					
J/6-182	25.85	40.32	26.25	12.96	23.04	25.69	24.52	38.01	22.28	10.00	18.75	22.71
MS/8-1148	28.08	41.30	26.18	22.85	24.60	28.60	26.71	39.33	21.27	17.83	21.97	25.42
K Bahar	25.69	30.71	28.19	24.63	26.30	27.11	24.38	29.15	24.86	20.86	22.34	24.32
K Khyati	31.91	56.10	27.59	32.13	30.33	35.61	30.36	54.08	23.72	26.30	27.67	32.43
K Pukhraj	31.01	52.35	29.04	36.88	27.94	35.44	29.56	50.05	24.63	27.37	24.64	31.25
K Gaurav	31.01	46.75	27.71	30.00	27.89	32.67	29.60	44.19	24.50	25.10	24.72	29.62
Mean B	28.92	44.59	27.49	26.58	26.69		27.52	42.47	23.54	21.24	23.35	
CD	Location (B) = 1.96; Genotype (C) = 2.15; B X C=4.80						Location (B) = 1.24; Genotype (C) = 2.15; B X C=4.81					

\* PS/5-75 (2015-16) and MS/9-723 (2016-17) in place of J/6-182

**Table 112.6:** Dry matter (%) performance in central plains (CHN, DES, GWL & KAN\*) at 90 days

Hybrid/ Control	CHN	DES	GWL	KAN*	Mean C
J/6-182	18.97	19.50	20.54	17.75	19.19
MS/8-1148	19.00	20.06	19.46	16.90	18.86
K Bahar	18.52	18.50	20.13	18.07	18.80
K Khyati	18.73	17.47	19.63	16.83	18.17
K Pukhraj	18.47	18.38	18.97	16.23	18.01
K Gaurav	18.45	19.26	20.48	18.33	19.13
Mean B	18.69	18.86	19.87	17.35	
CD	Location (B) = 0.38; Genotype (C) = 0.46; B X C=0.92				

\* PS/5-75 (2015-16) and MS/9-723 (2016-17) in place of J/6-182

**Table 112.7:** Yield (t/ha) performance under eastern plains (FZB, JRH, KAL, BHN\*) at 60 days

Hybrid/ Control	FZB	JRH	KAL	BHN*	Mean C	FZB	JRH	KAL	BHN*	Mean C
J/6-182	16.72	17.58	20.18	15.26	17.44	13.96	14.88	19.42	13.47	15.43
MS/8-1148	16.88	13.23	21.58	20.47	18.04	14.09	11.28	20.89	18.51	16.19
K Khyati	16.31	18.06	25.51	18.81	19.67	13.58	15.90	24.90	17.25	17.91
K Pukhraj	15.93	19.84	21.34	16.48	18.39	13.24	17.38	20.51	15.03	16.54
Mean B	16.46	17.18	22.15	17.75		13.72	14.86	21.43	16.06	
CD	Location (B) = 1.08; Genotype (C) = 1.08; B X C=2.15					Location (B) = 1.05; Genotype (C) = 1.05; B X C=2.09				

\* PS/5-75 (2015-16) and MS/9-2196 (2016-17) in place of J/6-182

**Table 112.8:** Yield (t/ha) performance under eastern plains (FZB, JRH, KAL, BHN\*, PAT\*\*) at 75 days

Hybrid/ Control	FZB	JRH	KAL	BHN*	PAT**	Mean C	FZB	JRH	KAL	BHN*	PAT**	Mean C
	Total yield (t/ha)						Marketable yield (t/ha)					
J/6-182	26.83	18.46	27.78	16.17	30.61	23.97	23.75	16.87	27.20	14.37	27.41	21.92
MS/8-1148	27.22	13.49	31.70	22.14	24.69	23.85	24.11	10.80	31.04	20.21	22.83	21.80
K Khyati	25.23	17.93	29.54	21.26	30.55	24.90	22.33	15.18	28.78	19.69	27.77	22.75
K Pukhraj	24.00	21.70	27.98	17.87	36.74	25.66	21.20	19.80	27.56	16.86	31.67	23.42
Mean B	25.82	17.90	29.25	19.36	30.65		22.85	15.66	28.65	17.78	27.42	
CD	Location (B) = 1.20; Genotype (C) = 1.07; B X C=2.39						Location (B) = 0.98; Genotype (C) = 0.88; B X C=1.96					

\* PS/5-75 (2015-16) and MS/9-2196 (2016-17) in place of J/6-182

\*\* PS/5-75 (2015-16) and PS/8-31 (2016-17) in place of J/6-182

**Table 112.9:** Yield (t/ha) performance under eastern plains (FZB, JRH, KAL, BHN\*, PAT\*\*) at 90 days

Hybrid/ Control	FZB	JRH	KAL	BHN*	PAT**	Mean C	FZB	JRH	KAL	BHN*	PAT**	Mean C
	Total yield (t/ha)						Marketable yield (t/ha)					
J/6-182	31.08	17.70	31.12	17.43	35.27	26.52	28.42	14.56	30.45	16.32	30.30	24.01
MS/8-1148	31.43	12.90	35.98	21.25	34.92	27.29	28.75	11.04	35.31	20.17	29.67	24.99
K Khyati	29.11	18.96	32.76	19.04	36.50	27.27	26.63	14.10	31.91	17.78	33.14	24.71
K Pukhraj	27.68	19.25	34.65	17.73	41.70	28.20	25.34	16.04	33.89	16.68	37.22	25.83
Mean B	29.82	17.20	33.62	18.86	37.10		27.29	13.93	32.89	17.74	32.58	
CD	Location (B) = 1.69; Genotype (C) = NS; B X C=3.39						Location (B) = 1.62; Genotype (C) = NS; B X C=3.23					

\* PS/5-75 (2015-16) and MS/9-2196 (2016-17) in place of J/6-182

\*\* PS/5-75 (2015-16) and PS/8-31 (2016-17) in place of J/6-182

**Table 112.10:** Dry matter (%) performance in eastern plains (FZB, JRH, KAL, BHN\*, PAT\*\*) at 90 days

Hybrid/ Control	FZB	JRH	KAL	BHN*	PAT**	Mean C
J/6-182	18.42	18.53	21.41	18.29	18.23	18.98
MS/8-1148	18.37	17.08	19.22	17.79	17.78	18.05
K Khyati	18.11	18.28	18.45	15.07	17.55	17.49
K Pukhraj	18.62	18.15	16.40	15.04	17.73	17.19
Mean B	18.38	18.01	18.87	16.55	17.82	
CD	Location (B) = 0.28; Genotype (C) = 0.25; B X C=0.56					

\* PS/5-75 (2015-16) and MS/9-2196 (2016-17) in place of J/6-182

\*\* PS/5-75 (2015-16) and PS/8-31 (2016-17) in place of J/6-182

## GENET. 7: TRIAL WITH PROCESSING HYBRIDS

Four processing hybrids (chip), viz. MP/04-816, MP/09-901, MP/08-1900 and MP/01-916 with controls, Kufri Chipsona-1, Kufri Chipsona-3, Kufri Surya and Atlantic were evaluated at 17 AICRP centres during the *rabi* season. Hybrids were evaluated during 90 days duration at Kota, 75 and 90 days crop durations at Pasighat, Bhubaneswar and Pune, during 75, 90 and 110 days crop durations at Chhindwara, Deesa, Dholi, Gwalior, Hisar, Jalandhar, Jorhat, Kalyani, Modipuram, Pantnagar and Raipur while at Faizabad and Patna the hybrids were evaluated for 90 and 110 days crop durations. Plant emergence was normal at all centres except in hybrid, MP/01-916 (75.05%) at Dholi. Late blight disease did not appear in most of the locations, low at Jorhat (5.0-11.0%), Pantnagar (4.0-6.0%), Pasighat (2.7-5.5%) and Pune (5.33-13.33%) while it was moderate at Faizabad (5-30%) and Dholi (18-28%). Viral disease incidence was low at all centres except Deesa, Jalandhar, Jorhat, Kalyani, (upto 10.00%), high in Kota (upto 20%), Raipur (upto 25%) Dholi (upto 71%). Leaf spot appeared at Chhindwara, Deesa, Dholi, Faizabad, Kalyani, Kota, Pasighat, Pune and Raipur in low to moderate intensity.

Kufri Chipsona-3 at Dholi, Gwalior, Hisar, Modipuram, Pasighat; Atlantic at Deesa, Faizabad, Jalandhar, Pantnagar, Patna; Kufri Surya at Bhubaneswar (75 & 90 days crop duration), Chhindwara (90 days duration) Jorhat; Kufri Chipsona-1 at Chhindwara (75 days crop duration) Kalyani, Kota, Pune were the best controls. At Deesa, Kufri Chipsona-3 for total yield and Atlantic for processing grade yield at 75 days crop duration and Kufri Chipsona-3 for both the yields at 90 and 110 days crop duration were the best controls. Similarly, at Raipur, Kufri Chipsona-3 for total yield whereas, Kufri Surya for processing grade yield at 90 and 110 days duration were the best controls.

Hybrid, MP/04-816, significantly out-yielded the best control for both total and processing grade tuber yields at Dholi, Faizabad, Pantnagar, Jorhat (75 days crop duration), Pune (90 days crop duration) Modipuram (110 days crop duration). Another hybrid, MP/01-916 significantly out-yielded the best control for both total and processing grade tuber yields at Dholi, Faizabad, Kota, Pantnagar, Patna, Pasighat (at 90 days crop duration) Modipuram (at 110 days crop duration).

Storage studies were conducted at Bhubaneswar, Deesa, Faizabad, Modipuram, Pune and Raipur. All the hybrids and controls recorded at par total weight loss after 3 months of storage at ambient temperature at Faizabad, Raipur and Pasighat but hybrid, MP/04-816 recorded less total weight loss in comparison to controls at Pune.

The data obtained over locations was pooled across zones. In northern zone the data over 2 locations viz., Hissar and Modipuram with common two hybrids viz., MP/04-816, MP/09-901 and four controls viz., Kufri Chipsona-4, Atlantic, Kufri Chipsona-1 and Kufri Chipsona-3 was pooled. Both the tuber yield differences among hybrids and controls were significant across locations, genotypes and location  $\times$  genotype with few exceptions. At both 75 and 90 days crop durations, Kufri Chipsona-3 and at 110 days crop duration Kufri Chipsona-4 were the best controls. Hybrid, MP/04-816 statistically out-yielded the best control for both total and marketable tuber yields at 110 days crop duration, while MP/09-901 out-yielded the best control for marketable tuber yield while it showed at par total tuber yield at 90 days crop duration.

In the central zone the data over 3 locations viz., Chhindwara, Deesa, Gwalior, Kota and Raipur with one common hybrid viz., MP/04-816 and three controls viz., Kufri Chipsona-4, Kufri Chipsona-1 and Kufri Chipsona-3 was pooled. Both the tuber yield differences among hybrids and controls were significant across locations, genotypes and location  $\times$  genotype. At both 75 days crop duration Kufri Chipsona-4 and at 90 and 110 days crop durations, Kufri Chipsona-3 was the best control. The hybrid could not out-yield the best control at any crop duration for both total and marketable tuber yields. In dry matter content, Kufri Chipsona-4 was the best control for all crop durations and none of the hybrid recorded high dry matter than the best control.

In the eastern zone the data over 3 locations viz., Bhubaneswar, Jorhat and Kalyani with two hybrids viz., MP/04-816 and MP/9-901 and four controls viz., Atlantic, Kufri Chipsona-4, Kufri Chipsona-1 and Kufri Chipsona-3 was pooled. Both the tuber yield differences among hybrids and controls were significant across locations, genotypes and location  $\times$  genotype. At 75 days crop durations, Kufri Chipsona-1 was the best control for both tuber and marketable yields. At 90 days crop durations, Kufri Chipsona-4 was the best control for evaluation trial of hybrid MP/04-816 at Bhubaneswar, Dholi, Faizabad and Kalyani and hybrid, MP/04-816

showed at par yield to the best control. Kufri Chipsona-1 was the best control for both tuber yields for evaluation trial of hybrid MP/09-901 at Jorhat and Kalyani. Also at 110 days crop durations, hybrid, MP/04-816 was common across 2 locations viz., Faizabad and Kalyani. Kufri Chipsona-1 was the best control for both tuber yields and hybrid, MP/04-816 yielded at par to the best control. At Kalyani centre, pooling of data for two years for two common hybrids, MP/04-816 and MP/09-901, Kufri Chipsona-4 for total tuber yield and Kufri Chipsona-1 for the marketable tuber yield were the best controls and the hybrid, MP/04-816 recorded at par yield to the best control.

**Table 113:** Experimental details

Experimental detail/Centre	BHN	CHN	DES	DHL	FZB	GWL
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD	RBD
Replication	4	4	3	4	4	3
Plot size (gross) m <sup>2</sup>	9.90	10.80	6.00	9.90	9.00	13.50
Spacing (cm)	60x20	60X20	50X20	66x25	60x20	60x20
Planting date	22.11.16	08.11.16	13.11.16	08.11.16	15.11.16	27.10.16
Dehauling	75 DAP	01.02.17	23.01.17	27.01.17	23.01.17	-
	90 DAP	14.02.17	08.02.17	11.02.17	08.02.17	13.02.17
	110 DAP	-	28.02.17	31.02.17	28.02.17	03.03.17
Harvesting	75 DAP	06.02.17	04.03.17	07.03.17	02.02.17	-
	90 DAP	20.02.17	04.03.17	07.03.17	18.02.17	22.02.17
	110 DAP	-	04.03.17	07.03.17	10.03.17	11.03.17
N:P:K dose (kg/ha)	225:80:150	180:120:100	412.5:138:412.5	150:90:100	-	270:80:150
Duration of crop (days)	75 & 90	75,90 & 110	75,90 & 110	75, 90 & 110	90& 110	75, 90 & 110

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Experimental detail/Centre	HIS	JAL	JRH	KAL	KTT
Year	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD
Replication	4	3	3	3	3
Plot size (gross) m <sup>2</sup>	9.00	5.40	9.90	6.00	7.20
Spacing (cm)	60x20	60x20	66x25	60X20	60x20
Planting date	19.10.16	15.10.16	18.11.16	29.11.16	22.11.16
Dehauling	75 DAP	05.01.17	29.12.16	02.02.17	14.02.17
	90 DAP	20.01.17	13.01.17	17.02.17	01.03.17
	110 DAP	09.02.17	02.02.17	09.03.17	21.03.17
Harvesting	75 DAP	01.03.17	21.01.17	09.02.17	24.02.17
	90 DAP	01.03.17	07.02.17	24.02.17	11.03.17
	110 DAP	01.03.17	08.03.17	16.03.17	01.04.17
N:P:K dose (kg/ha)	200:75:150	240:100:150	120:100:100	200:150:150	187.5:125:125
Duration of crop (days)	75,90 & 110	75,90 & 110	75,90 & 110	75,90 & 110	75&90

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Experimental detail/Centre	MDP	PNT	PAT	PUN	PAS	RPR
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD	RBD
Replication	3	3	3	3	3	4
Plot size (gross) m <sup>2</sup>	9.90	9.00	10.80	9.00	9.00	9.00
Spacing (cm)	60x20	60x20	60x20	60x20	60x20	60x20
Planting date	26.10.16	22.10.16	19.11.16	07.11.16	29.10.16	15.11.16
Dehauling	75 DAP	12.01.17	06.01.17	02.02.17	13.01.17	07.01.17
	90 DAP	27.01.17	22.01.17	17.02.17	08.02.17	16.01.17
	110 DAP	15.02.17	12.02.17	09.03.17	-	-
Harvesting	75 DAP	24.02.17	17.01.17	15.02.17	22.01.17	13.01.17
	90 DAP	24.02.17	02.02.17	27.02.17	15.02.17	29.01.17
	110 DAP	24.02.17	22.02.17	16.03.17	-	-
N:P:K dose (kg/ha)	270:80:150	160:100: 100	-	150:60:120	150: 120:100	150:100:100
Duration of crop (days)	75,90 & 110	75,90 & 110	75,90 & 110	75,90 & 110	60,75 & 90	75,90 & 110



## BHUBANESHWAR

**Table 114:** Plant emergence (%), seed wt (t/ha), foliage senescence (%), total & mkt. tuber yield (t/ha) , weight of rotten tubers (t/ha) and dry matter (%) in 75 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Mkt. tuber yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MP/4-816	90.00	2.15	43.02	16.90	16.14	0.36	19.30
MP/9-901	89.25	2.46	51.51	19.26	18.88	1.22	19.51
MP/8-1900	93.25	2.53	46.93	22.39	20.02	1.07	19.14
MP/01-916	96.00	2.02	49.23	20.41	19.41	1.11	18.35
Atlantic	97.50	2.12	39.58	21.27	20.16	1.05	17.20
K Chipsona-1	97.00	2.10	62.10	23.88	22.46	0.84	17.85
K Chipsona-3	94.00	2.61	37.63	22.37	21.22	0.73	20.95
K Surya	90.75	2.86	37.10	23.26	22.47	0.99	19.60
SEd	2.04	0.09	1.08	0.98	1.14	0.16	0.37
CD (0.05)	4.28	0.18	2.25	2.05	2.39	0.34	0.77
CV (%)	3.09	5.18	3.32	6.52	8.04	24.77	2.74

**Table 115:** Plant emergence (%), seed wt (t/ha), foliage senescence (%), total & mkt. tuber yield (t/ha) , weight of rotten tubers (t/ha) and dry matter (%) in 90 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Mkt. tuber yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MP/4-816	89.25	2.11	93.18	16.69	16.00	0.37	20.03
MP/9-901	94.25	2.33	91.98	19.97	20.15	0.68	22.00
MP/8-1900	97.00	2.60	89.95	21.02	20.06	1.73	19.15
MP/01-916	97.75	1.87	90.93	21.16	20.55	1.09	19.98
Atlantic	98.00	2.16	87.05	16.76	16.37	1.30	19.53
K Chipsona-1	98.75	2.22	91.98	22.20	21.25	1.30	20.05
K Chipsona-3	89.25	2.96	86.00	20.36	19.28	1.18	20.83
K Surya	94.50	2.76	82.98	23.25	22.45	0.75	20.18
SEd	2.90	0.09	0.66	0.95	0.91	0.16	0.32
CD (0.05)	6.08	0.19	1.38	2.00	1.90	0.33	0.68
CV (%)	4.33	5.53	1.05	6.69	6.56	20.96	2.27

**Table 116:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 75 days)		Number basis	Weight basis	
MP/4-816	> 6 weeks	64.0	100.0	-	6.2	-	16.8
MP/9-901	> 6 weeks	-	-	-	-	-	-
MP/6-39	> 6 weeks	-	-	-	-	-	-
MP/01-916	> 6 weeks	-	-	-	-	-	-
Atlantic	> 6 weeks	0.0	0.0	-	9.1	-	18.9
K Chipsona-1	> 6 weeks	0.0	0.0	-	0.0	-	9.5
K Chipsona-3	> 6 weeks	0.0	49.0	-	7.7	-	11.7

## CHHINDWARA

**Table 117:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), dry matter (%) and chip colour (1-5 scale) in 75 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)	Chip colour (1-5 scale)
MP/4-816	94.33	4.14	73.00	27.83	18.08	16.77	3.27
MP/01-916	93.67	4.29	73.07	26.14	16.99	17.20	3.20
Atlantic	94.33	4.97	71.83	24.51	15.93	16.60	4.27
K Chipsona-1	94.00	4.63	71.20	28.49	19.31	17.23	2.13
K Chipsona-3	93.33	4.78	72.73	26.91	17.49	16.70	4.93
K Surya	94.33	4.82	71.80	27.41	17.81	17.13	4.10
SEd	1.37	0.20	0.99	1.06	0.72	0.13	0.13
CD (0.05)	NS	0.45	NS	2.39	1.63	0.30	0.29
CV (%)	1.78	5.36	1.68	4.83	5.03	0.96	4.27

**Table 118:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), dry matter (%) and chip colour (1-5 scale) in 90 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)	Chip colour (1-5 scale)
MP/4-816	95.00	4.04	83.00	33.34	24.00	18.20	3.73
MP/01-916	93.33	4.26	85.80	32.38	23.29	18.20	3.10
Atlantic	94.00	4.91	89.07	25.60	18.42	17.73	4.37
K Chipsona-1	94.33	4.66	88.17	33.65	23.79	18.70	2.17
K Chipsona-3	93.67	4.72	87.77	28.43	20.44	18.43	5.00
K Surya	96.00	4.82	87.30	34.92	25.14	18.13	4.10
SEd	1.43	0.18	0.93	1.73	1.33	0.15	0.10
CD (0.05)	NS	0.40	2.09	3.91	3.00	0.33	0.22
CV (%)	1.85	4.69	1.31	6.76	7.24	0.98	3.22

**Table 119:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), dry matter (%) and chip colour (1-5 scale) in 110 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)	Chip colour (1-5 scale)
MP/4-816	96.00	4.20	96.33	36.53	28.85	19.10	3.47
MP/01-916	92.00	4.23	98.40	33.68	26.60	19.10	3.30
Atlantic	94.33	5.03	98.03	28.37	22.38	18.77	4.23
K Chipsona-1	94.33	4.60	97.60	34.82	27.50	19.03	2.23
K Chipsona-3	93.67	4.63	96.67	32.29	25.50	18.87	5.00
K Surya	94.33	4.88	96.60	36.33	28.70	19.13	4.13
SEd	1.36	0.17	0.73	0.85	0.68	0.09	0.15
CD (0.05)	NS	0.38	NS	1.92	1.52	0.21	0.34
CV (%)	1.77	4.44	0.92	3.10	3.11	0.61	4.91

**Table 120:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days			110 days		
MP/4-816				0.0	3.3	2.2	0.0	4.9	2.4
MP/01-916				0.0	4.1	2.6	0.0	5.0	3.2

Atlantic	Did not appear	0.0	4.3	3.1	0.0	5.1	3.0
K Chipsona-1		0.0	2.3	1.6	0.0	3.3	3.1
K Chipsona-3		0.0	3.7	2.3	0.0	4.0	3.2
K Surya		0.0	2.0	2.0	0.0	3.0	3.0

## DEESA

**Table 121:** Plant emergence (%), seed wt.(t/ha), foliage senescence (1-5 scale), total & processing grade tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (1-5 scale)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	85.00	4.43	1.67	19.82	11.97	20.67
MP/9-901	98.33	4.25	2.17	22.14	18.28	20.47
MP/01-916	91.67	4.57	2.17	23.98	14.81	22.57
Atlantic	87.50	4.58	2.57	25.47	19.44	19.00
K Chipsona-1	94.17	4.38	2.33	29.25	14.73	19.00
K Chipsona-3	100.00	4.24	2.00	33.29	19.35	19.53
K Surya	85.00	4.46	2.33	19.98	13.20	17.20
SEd	4.84	0.03	0.24	1.40	2.07	0.46
CD (0.05)	10.65	0.06	NS	3.08	4.56	1.01
CV (%)	6.46	0.78	13.22	6.88	15.86	2.85

**Table 122:** Plant emergence (%), seed wt.(t/ha), foliage senescence (1-5 scale), total & processing grade tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (1-5 scale)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	93.33	4.42	3.50	32.87	17.58	21.07
MP/9-901	98.33	4.27	4.00	29.58	23.33	21.07
MP/01-916	82.50	4.59	3.67	26.84	18.30	23.47
Atlantic	85.83	4.60	3.33	27.45	20.01	20.80
K Chipsona-1	92.50	4.46	4.00	37.55	22.76	19.07
K Chipsona-3	99.17	4.26	3.50	45.98	35.75	20.87
K Surya	93.33	4.45	4.17	26.84	17.52	19.07
SEd	3.30	0.06	0.21	2.76	2.10	0.47
CD (0.05)	7.27	0.12	0.45	6.07	4.62	1.03
CV (%)	4.38	1.52	6.74	10.41	11.59	2.77

**Table 123:** Plant emergence (%), seed wt.(t/ha), foliage senescence (1-5 scale), total & processing grade tuber yield (t/ha) and dry matter (%) in 110 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (1-5 scale)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	86.67	4.44	5.00	34.87	23.04	21.60
MP/9-901	98.33	4.32	5.00	31.43	24.23	21.20
MP/01-916	86.67	4.60	5.00	31.78	19.28	23.60
Atlantic	90.00	4.66	5.00	31.21	21.29	21.73
K Chipsona-1	95.83	4.50	5.00	38.55	25.67	19.47
K Chipsona-3	99.17	4.32	5.00	47.78	38.08	21.00
K Surya	93.33	4.58	5.00	31.01	22.46	20.07
SEd	4.16	0.06	0.00	1.36	1.74	0.60
CD (0.05)	9.15	0.14	NS	3.00	3.84	1.33
CV (%)	5.48	1.69	0.08	4.73	8.59	3.47

**Table 124:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days			110 days		
MP/4-816	Did not appear	1.05	4.63	Did not appear	7.37	4.46	Did not appear	9.22	5.83
MP/9-901		3.55	4.25		8.00	4.23		10.36	6.22
MP/01-916		4.54	4.53		9.09	4.04		9.86	5.93
Atlantic		4.37	7.49		8.51	8.51		10.11	8.13
K Chip-1		7.07	2.07		8.52	0.90		9.74	1.82
K Chip-3		0.83	2.50		2.52	0.00		4.59	2.03
K Surya		0.98	8.52		1.78	8.92		2.32	9.29

**Table 125:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
MP/4-816	> 6 weeks	0.0	2.5	0.0	11.3	10.4	21.5
MP/9-901	> 6 weeks	0.0	0.0	0.0	9.8	6.5	18.5
MP/01-916	> 6 weeks	0.0	0.0	0.0	10.0	11.0	20.1
Atlantic	> 6 weeks	0.0	0.0	0.0	8.7	8.5	18.9
K Chipsona-1	> 6 weeks	0.0	0.0	0.0	4.0	3.1	10.9
K Chipsona-3	> 6 weeks	0.0	10.9	0.1	4.6	4.8	14.3
K Surya	> 6 weeks	0.0	2.0	0.0	2.4	2.3	10.6

**DHOLI****Table 126:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), weight of rotten tubers (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MP/4-816	97.00	4.09	23.00	7.50	5.43	0.05	18.94
MP/01-916	75.05	4.80	18.25	9.60	7.73	0.02	18.25
Atlantic	96.65	2.53	24.25	6.77	5.08	0.06	19.85
K Chipsona-1	97.40	4.25	30.25	6.52	4.52	0.03	17.59
K Chipsona-3	96.30	3.41	26.75	7.33	5.81	0.02	19.50
SEd	13.78	0.39	1.69	0.57	0.53	0.02	0.19
CD (0.05)	NS	0.87	3.72	1.25	1.18	NS	0.41
CV (%)	21.08	14.56	9.75	10.61	13.21	56.76	1.41

**Table 127:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), weight of rotten tubers (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MP/4-816	97.90	3.92	42.00	8.28	6.72	0.06	20.06
MP/01-916	96.65	4.52	38.25	10.08	8.84	0.06	19.14
Atlantic	97.00	2.78	44.00	6.92	5.56	0.07	21.20
K Chipsona-1	96.00	4.32	51.50	7.71	6.31	0.05	19.19
K Chipsona-3	97.95	3.59	47.75	7.73	6.62	0.03	19.86
SEd	0.54	0.39	1.83	0.39	0.51	0.02	0.43
CD (0.05)	1.18	0.86	4.03	0.85	1.12	NS	0.95
CV (%)	0.78	14.37	5.79	6.68	10.57	61.59	3.05

**Table 128:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), weight of rotten tubers (t/ha) and dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MP/4-816	97.65	4.02	52.75	10.43	8.51	0.44	21.09
MP/01-916	96.00	4.75	50.75	12.70	10.91	0.08	19.66
Atlantic	97.15	2.53	61.00	9.42	8.28	0.04	21.14
K Chipsona-1	96.25	4.37	74.00	10.18	8.81	0.07	23.08
K Chipsona-3	97.50	3.49	56.00	11.11	9.14	0.07	20.76
SEd	0.89	0.33	2.21	0.41	0.48	0.22	1.21
CD (0.05)	NS	0.72	4.86	0.91	1.05	NS	NS
CV (%)	1.29	12.08	5.30	5.43	7.37	228.82	8.11

**Table 129:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days			110 days		
MP/4-816	25	5	10	27	8	10	28	8	8
MP/01-916	20	0	71	22	2	5	25	0	0
Atlantic	25	8	12	25	5	8	28	7	9
K Chip-1	18	5	10	20	8	12	18	8	6
K Chip-3	20	10	18	21	10	8	22	5	15

#### FAIZABAD

**Table 130:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), weight of rotten tubers (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MP/4-816	92.67	3.85	76.25	31.11	27.37	1.02	19.88
MP/01-916	91.67	3.78	72.50	30.00	26.40	0.94	19.64
Atlantic	94.00	3.82	76.25	27.78	24.44	0.94	19.70
K Chipsona-1	93.00	3.83	74.00	26.66	23.49	0.97	19.53
K Chipsona-3	92.67	3.78	76.00	27.22	23.96	0.86	19.93
K Surya	92.33	3.79	78.00	25.56	22.53	0.86	19.93
SEd	1.52	0.05	1.38	1.36	1.20	0.04	0.11
CD (0.05)	NS	NS	2.96	2.92	2.58	0.09	0.23
CV (%)	2.32	1.91	2.58	6.83	6.86	6.25	0.76

**Table 131:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), weight of rotten tubers (t/ha) and dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MP/4-816	93.34	3.78	92.67	37.22	33.50	1.13	20.28
MP/01-916	93.00	3.79	91.25	35.33	31.80	1.07	20.03
Atlantic	92.00	3.78	93.00	32.89	29.60	1.00	20.11
K Chipsona-1	93.00	3.81	89.75	31.55	29.23	1.10	19.95
K Chipsona-3	92.34	3.81	93.00	32.22	26.22	0.89	20.35
K Surya	92.33	3.78	93.75	29.89	26.90	0.96	20.30
SEd	1.24	0.03	1.89	1.32	1.77	0.04	0.10
CD (0.05)	NS	NS	NS	2.84	3.80	0.08	0.22
CV (%)	1.89	0.94	2.91	5.63	8.46	5.29	0.71

**Table 132:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	90 days			110 days		
MP/4-816	5	5	0	5	25	0
MP/01-916	15	0	0	25	40	0
Atlantic	15	10	0	20	45	5
K Chipsona-1	20	5	0	25	50	0
K Chipsona-3	20	0	0	25	45	0
K Surya	25	10	0	30	55	5

**Table 133:** Total weight loss after 3 months storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
MP/4-816	> 6 weeks	0.00	85.00	1.20	22.00	30.00	31.20
MP/01-916	> 6 weeks	0.00	90.00	1.02	30.00	26.00	27.02
Atlantic	> 6 weeks	0.00	80.00	1.50	32.00	23.00	24.50
K Chipsona-1	> 6 weeks	0.00	85.00	1.70	28.00	29.00	30.70
K Chipsona-3	> 6 weeks	0.00	80.00	1.75	33.00	32.00	33.75
K Surya	> 6 weeks	0.00	90.00	1.88	35.00	35.00	36.88

**GWALIOR****Table 134:** Plant emergence (%), total & processing grade tuber yield (t/ha) and dry matter (%) in 75 & 90 days crop.

Hybrid/variety	Emergence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)	75 days		90 days	
					Emergence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	90.97	24.79	12.55	20.75	90.97	30.09	13.47	24.19
MP/01-916	89.58	28.96	14.98	20.69	89.58	35.13	15.62	23.75
Atlantic	82.99	28.23	12.07	21.21	82.99	34.45	17.10	23.22
K Chipsona-1	83.33	24.42	12.52	20.09	83.33	34.92	17.45	22.81
K Chipsona-3	86.11	28.19	16.06	19.39	86.11	37.05	16.85	23.12
SEd	5.63	3.26	1.88	1.71	5.63	5.26	3.21	0.60
CD (0.05)	NS	NS	NS	NS	NS	NS	NS	NS
CV (%)	9.20	17.14	19.51	11.84	9.20	21.67	28.23	3.61

**Table 135:** Plant emergence (%), total & processing grade tuber yield (t/ha) and dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	90.97	35.29	16.34	22.47
MP/01-916	89.58	41.48	17.19	21.78
Atlantic	82.99	40.66	17.21	20.67
K Chipsona-1	83.33	40.73	17.56	19.88
K Chipsona-3	86.11	41.83	17.86	21.71
SEd	5.63	4.08	1.87	1.11
CD (0.05)	NS	NS	NS	NS
CV (%)	9.20	14.43	15.36	7.34

## HISAR

**Table 136:** Plant emergence (%), seed wt.(t/ha), total & processing grade tuber yield (t/ha) in 75 & 90 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Processing grade yield (t/ha)	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Processing grade yield (t/ha)
MP/4-816	94.23	3.71	31.83	26.62	94.27	3.86	41.50	34.94
MP/9-901	98.32	3.52	30.59	29.77	96.67	3.79	41.17	40.25
MP/01-916	97.55	3.04	22.70	21.07	94.69	3.24	31.83	29.08
Atlantic	96.07	4.07	19.29	18.64	97.55	4.01	29.96	28.83
K Chipsona-1	95.55	2.63	20.98	14.28	96.07	2.86	36.50	31.57
K Chipsona-3	95.64	2.99	34.46	31.27	95.55	2.95	39.18	35.16
K Surya	95.70	2.84	31.05	25.79	95.64	2.77	33.18	29.82
SEd	1.26	0.19	2.06	1.70	1.41	0.19	2.42	2.58
CD (0.05)	NS	0.41	4.35	3.61	NS	0.39	5.12	5.47
CV (%)	1.86	8.43	10.66	10.07	2.07	7.82	9.44	11.14

**Table 137:** Plant emergence (%), seed wt.(t/ha), total & processing grade tuber yield (t/ha) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Processing grade yield (t/ha)
MP/4-816	95.70	3.80	48.36	45.63
MP/9-901	94.27	3.77	48.13	46.48
MP/01-916	98.32	3.28	45.33	42.62
Atlantic	94.72	4.08	35.59	33.76
K Chipsona-1	93.89	2.74	43.32	38.55
K Chipsona-3	95.64	3.30	43.62	36.35
K Surya	97.29	2.78	42.18	37.73
SEd	0.78	0.18	2.01	1.45
CD (0.05)	1.66	0.37	4.25	3.07
CV (%)	1.16	7.28	6.48	5.11

**Table 138:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days			110 days		
MP/4-816	Did not appear	Did not appear	0.0	Did not appear	Did not appear	0.4	Did not appear	Did not appear	0.9
MP/9-901			0.0			0.0			
MP/01-916			0.0			0.0			
Atlantic			0.0			0.0			
K Chip-1			0.0			0.0			
K Chip-3			0.3			0.5			
K Surya			0.0			0.3			0.8

## JALANDHAR

**Table 139:** Plant emergence (%), seed wt.(t/ha), total & processing grade tuber yield (t/ha), dry matter (%), chip colour (1-5 scale) and reducing sugar (%/100 FW) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)	Chip colour (1-5 scale)	Reducing sugar (% /100 FW)
MP/4-816	95.00	5.93	24.32	20.13	19.35	4.33	223.75

MP/9-901	97.33	5.06	26.73	22.96	22.27	4.08	197.94
MP/01-916	91.00	5.74	26.73	22.28	24.03	6.33	238.32
Atlantic	91.67	6.42	27.35	23.52	20.02	4.67	228.91
K Chipsona-1	85.67	4.94	25.68	21.17	21.46	6.33	285.68
K Chipsona-3	86.67	4.26	25.93	21.48	20.09	3.83	252.89
K Surya	88.00	4.69	26.61	22.90	21.15	4.17	223.44
SEd	3.23	0.57	NS	1.96	0.20	1.16	10.22
CD (0.05)	1.46	0.26	0.98	0.89	0.09	0.53	4.64
CV (%)	1.98	5.93	4.59	4.95	0.52	13.37	2.41

**Table 140:** Plant emergence (%), seed wt.(t/ha), total & processing grade tuber yield (t/ha), dry matter (%), chip colour (1-5 scale) and reducing sugar (%/100 FW) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)	Chip colour (1-5 scale)	Reducing sugar (% /100 FW)
MP/4-816	94.33	5.74	30.00	27.10	21.27	4.00	188.22
MP/9-901	95.00	5.37	33.15	29.63	23.44	4.00	166.06
MP/01-916	90.33	5.93	29.63	26.79	23.88	5.67	190.96
Atlantic	92.33	6.30	35.50	29.88	23.44	2.67	74.68
K Chipsona-1	88.33	5.06	33.21	27.41	23.73	2.33	121.44
K Chipsona-3	83.67	4.38	31.30	27.78	21.83	4.33	127.81
K Surya	82.00	4.63	30.74	27.66	20.01	4.83	201.89
SEd	4.13	0.72	1.18	1.08	0.53	0.74	44.15
CD (0.05)	1.88	0.33	0.53	0.49	0.24	0.34	20.04
CV (%)	2.57	7.51	2.05	2.15	1.30	10.33	16.04

**Table 141:** Plant emergence (%), seed wt.(t/ha), total & processing grade tuber yield (t/ha), dry matter (%), chip colour (1-5 scale) and reducing sugar (%/100 FW) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)	Chip colour (1-5 scale)	Reducing sugar (% /100 FW)
MP/4-816	92.33	5.56	35.06	29.26	23.69	3.83	123.86
MP/9-901	93.33	5.31	38.64	31.36	24.36	4.17	123.56
MP/01-916	91.00	5.87	31.42	26.11	26.85	4.00	169.10
Atlantic	90.33	5.87	35.80	30.62	25.59	2.17	51.30
K Chipsona-1	87.33	5.00	35.62	28.40	24.46	1.83	65.57
K Chipsona-3	84.33	4.51	32.84	28.95	23.43	3.17	60.72
K Surya	88.00	4.75	32.10	28.83	23.84	2.83	106.86
SEd	4.30	0.86	1.70	1.38	0.91	0.89	7.15
CD (0.05)	1.95	0.39	0.77	0.63	0.41	0.40	3.25
CV (%)	2.67	9.05	2.73	2.63	2.05	15.72	3.97

**Table 142:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days			110 days		
MP/4-816	0	0	10	0	0	10	0	0	10
MP/9-901	0	0	15	0	0	15	0	0	15
MP/01-916	0	0	15	0	0	15	0	0	15
Atlantic	0	0	5	0	0	5	0	0	5
K Chipsona-1	0	0	10	0	0	10	0	0	10
K Chipsona-3	0	0	5	0	0	5	0	0	5
K Surya	0	0	5	0	0	5	0	0	5



**JORHAT**

**Table 143:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	94.00	1.09	47.00	13.04	9.85	18.30
MP/9-901	95.33	1.80	3.00	13.96	10.75	15.00
MP/8-1900	94.00	1.12	7.67	14.24	11.41	15.00
MP/01-916	91.00	1.64	6.00	9.00	6.08	18.00
Atlantic	92.67	1.27	27.00	11.74	8.55	15.67
K Chipsona-1	91.33	2.36	8.00	10.50	7.39	17.80
K Chipsona-3	91.33	1.78	5.00	10.96	7.88	15.07
K Surya	91.00	1.32	7.33	12.70	9.69	18.20
SEd	1.97	0.18	0.58	0.31	0.33	0.44
CD (0.05)	NS	0.38	1.26	0.66	0.71	0.95
CV (%)	2.61	13.82	5.13	3.12	4.50	3.22

**Table 144:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	93.00	0.82	36.00	16.20	11.60	20.50
MP/9-901	93.00	1.20	7.33	16.53	12.98	15.20
MP/8-1900	93.33	1.03	4.67	19.38	14.55	15.10
MP/01-916	91.00	1.48	9.00	12.40	7.90	18.83
Atlantic	91.67	1.27	20.00	16.18	10.48	16.50
K Chipsona-1	93.67	2.53	3.00	13.62	9.16	18.17
K Chipsona-3	94.67	1.79	4.67	15.01	10.49	19.00
K Surya	95.33	1.22	0.00	23.07	16.40	15.27
SEd	1.81	0.20	0.51	0.36	0.36	0.46
CD (0.05)	NS	0.43	1.10	0.77	0.78	1.00
CV (%)	2.38	17.10	5.88	2.63	3.79	3.26

**Table 145:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha) and dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	98.33	0.82	46.00	20.06	14.13	18.67
MP/9-901	94.67	0.99	10.00	18.90	16.05	16.80
MP/8-1900	96.00	0.99	7.00	19.71	13.60	17.77
MP/01-916	94.33	1.26	5.00	16.43	11.07	17.90
Atlantic	94.33	1.66	14.00	13.86	9.04	16.70
K Chipsona-1	93.67	2.16	8.00	14.38	8.51	17.07
K Chipsona-3	94.33	1.75	9.00	15.58	9.85	17.67
K Surya	93.67	1.27	17.00	21.21	15.04	19.37
SEd	2.19	0.14	0.68	0.59	0.56	0.43
CD (0.05)	NS	0.30	1.48	1.29	1.20	0.93
CV (%)	2.82	12.34	5.76	4.15	5.60	2.95

**Table 146:** Disease reaction

Hybrids/variety	Late blight (%)	Viral diseases (%)	Late blight (%)	Viral diseases (%)	Late blight (%)	Viral diseases (%)
	60 days		75 days		90 days	
MP/4-816	7	0	5	11	0	7

MP/9-901	9	0	9	12	0	11
MP/8-1900	11	0	11	13	0	13
MP/01-916	9	0	8	11	0	11
Atlantic	7	0	8	10	0	12
K Chipsona-1	8	0	9	9	0	11
K Chipsona-3	6	0	7	8	0	10
K Surya	11	0	8	13	0	10

#### KALYANI

**Table 147:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	98.00	2.21	10.67	27.67	25.57	19.67
MP/9-901	98.33	2.09	14.33	23.34	22.34	19.05
MP/01-916	99.33	2.34	8.67	28.56	27.12	18.27
Atlantic	97.33	3.08	20.67	25.34	24.28	20.28
K Chipsona-1	98.67	2.20	12.67	29.95	28.84	20.09
K Chipsona-3	98.33	3.24	18.67	24.84	22.62	19.39
K Surya	99.33	2.52	9.00	22.00	20.23	19.14
SEd	1.03	0.07	1.21	2.24	2.16	0.69
CD (0.05)	NS	0.16	2.66	4.94	4.76	NS
CV (%)	1.28	3.45	10.92	10.58	10.82	4.33

**Table 148:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	98.00	2.21	47.33	29.84	29.06	20.51
MP/9-901	97.67	2.09	48.33	27.12	26.28	20.43
MP/01-916	100.00	2.34	48.33	32.12	31.67	20.49
Atlantic	96.67	3.08	66.67	28.73	28.06	21.00
K Chipsona-1	99.33	2.20	63.00	32.17	31.23	19.97
K Chipsona-3	98.33	3.24	50.00	26.45	24.78	20.17
K Surya	98.00	2.52	55.33	26.23	26.12	19.93
SEd	1.06	0.07	2.92	1.95	2.00	0.65
CD (0.05)	NS	0.16	6.44	4.29	4.40	NS
CV (%)	1.33	3.45	6.61	8.25	8.67	3.94

**Table 149:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha) and dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	98.00	2.21	80.33	32.51	31.06	22.40
MP/9-901	97.67	2.09	80.00	31.35	30.32	22.92
MP/01-916	100.00	2.34	84.33	35.42	34.18	20.64
Atlantic	96.67	3.08	93.33	32.68	32.41	23.02
K Chipsona-1	99.33	2.20	94.33	36.04	35.18	22.20
K Chipsona-3	98.33	3.24	85.00	29.56	28.31	22.95
K Surya	98.00	2.52	90.33	30.92	29.93	20.88
SEd	1.06	0.07	2.85	1.47	1.15	0.27
CD (0.05)	NS	0.16	6.29	3.24	2.53	0.59
CV (%)	1.33	3.45	4.03	5.52	4.44	1.48

**Table 150:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days			110 days		
MP/4-816	Did not appear	4.5	7.3	6.5	6.8	9.3	10.5	7.3	10.4
MP/9-901		6.4	9.3	DNA	7.8	7.3	5.0	8.0	10.8
MP/01-916		4.9	7.7	9.3	6.6	8.3	12.0	8.5	9.8
Atlantic		7.8	8.4	10.0	8.5	10.0	12.4	9.3	11.2
K Chipsona-1		8.3	7.5	DNA	8.8	9.5	DNA	9.5	11.0
K Chipsona-3		5.7	8.8	DNA	7.8	9.0	8.0	9.3	10.5
K Surya		6.2	6.7	7.0	8.0	8.0	9.5	8.7	9.4

**KOTA****Table 151:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), weight of rotten tubers (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MP/4-816	91.50	3.22	76.25	11.06	9.53	0.19	20.40
MP/01-916	93.83	3.67	74.50	12.86	11.89	0.42	20.08
K Chipsona-1	91.50	2.81	78.75	11.61	9.75	0.22	20.13
K Surya	91.75	3.47	76.25	10.44	9.69	0.19	19.58
SEd	0.75	0.18	2.57	0.65	0.34	0.13	0.21
CD (0.05)	1.73	0.42	NS	1.49	0.78	NS	0.48
CV (%)	1.16	7.81	4.75	7.97	4.72	69.28	1.48

**Table 152:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
MP/4-816	0	23.50	15.00
MP/01-916	0	14.00	19.50
K Chipsona-1	0	4.50	8.00
K Surya	0	0.00	11.00

**MODIPURAM****Table 153:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	4.34	98.33	2.00	18.97	12.07	17.87
MP/9-901	3.13	98.33	2.83	21.60	17.12	16.76
MP/8-1900	3.84	95.00	2.50	25.91	16.10	19.72
MP/01-916	5.28	97.22	2.00	22.63	15.81	18.03
Atlantic	4.27	86.11	3.00	22.37	17.14	18.02
K Chipsona-1	3.97	97.22	2.50	22.72	15.26	17.08
K Chipsona-3	3.80	97.78	2.33	22.18	15.70	17.07
K Surya	3.16	94.45	2.67	22.40	15.53	15.76
SEd	0.37	3.37	0.14	0.64	0.91	0.21
CD (0.05)	0.80	7.29	0.31	1.39	1.98	0.45
CV (%)	11.34	4.32	6.96	3.52	7.16	1.46

**Table 154:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	4.61	94.44	3.00	31.49	22.84	18.03
MP/9-901	3.84	93.89	3.50	33.71	27.90	20.13
MP/8-1900	4.88	88.89	3.13	35.50	29.29	20.57
MP/01-916	4.24	96.11	3.00	35.81	29.89	18.09
Atlantic	4.24	88.89	3.50	33.75	29.03	19.57
K Chipsona-1	4.34	94.44	3.00	37.60	28.36	19.19
K Chipsona-3	3.60	97.78	3.00	36.78	30.60	17.96
K Surya	3.10	88.34	3.50	32.68	26.13	17.17
SEd	0.54	2.71	0.07	0.78	0.82	0.32
CD (0.05)	NS	5.87	0.14	1.69	1.78	0.70
CV (%)	16.22	3.58	2.55	2.76	3.59	2.11

**Table 155:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha) and dry matter (%) in 110 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	4.95	90.56	3.50	49.71	42.87	19.91
MP/9-901	3.77	95.00	4.33	41.46	36.96	20.17
MP/8-1900	3.87	90.56	3.67	46.49	38.56	22.56
MP/01-916	5.15	90.00	3.33	45.58	40.26	20.43
Atlantic	4.72	90.56	4.33	38.75	34.89	20.10
K Chipsona-1	4.28	88.34	3.50	44.34	36.70	19.91
K Chipsona-3	3.67	91.11	3.33	45.69	39.66	20.51
K Surya	3.20	98.33	4.00	41.61	36.19	18.45
SEd	0.50	3.38	0.19	1.11	1.48	0.47
CD (0.05)	1.09	NS	0.42	2.41	3.21	1.02
CV (%)	14.62	4.52	6.26	3.09	4.74	2.85

**Table 156:** Total weight loss after 3 months storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage Weight basis	Total wt. Losses (%)
		At 6 weeks	End of storage ( 75days)			
MP/4-816	> 6 weeks	11.52	14.55	0.025	0.87	12.6
MP/9-901	> 6 weeks	0	37.35	0.04	1.65	13.8
MP/8-1900	> 6 weeks	41.78	41.78	0.09	1.08	9.41
MP/01-916	> 6 weeks	11.26	22.14	0.02	0.68	10.43
Atlantic	> 6 weeks	9.65	15.28	0.03	7.07	14.32
K Chipsona-1	> 6 weeks	5.236	10.519	0.019	3.478	11.06
K Chipsona-3	> 6 weeks	67.99	89.15	0.42	1.65	12.07
K Surya	> 6 weeks	30.53	30.53	0.02	1.33	7.69

## PANTNAGAR

**Table 157:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), weight of rotten tubers (t/ha), tuber dry matter (%) and chip colour (1-5 scale) in 75 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)	Chip colour (1-5 scale)
MP/4-816	97.00	3.85	75.33	30.37	23.29	0.67	16.83	3.00

MP/01-916	97.33	4.08	75.33	29.11	21.92	0.75	16.73	2.67
Atlantic	97.00	3.89	75.67	27.15	20.52	0.72	14.73	2.67
K Chipsona-1	97.00	3.63	76.00	26.30	17.92	0.76	14.40	2.00
K Chipsona-3	97.33	3.74	75.67	24.82	16.41	0.78	15.43	2.67
K Surya	96.67	3.78	76.67	23.66	16.04	0.75	14.47	2.33
SEd	0.89	0.33	0.68	1.21	1.06	0.15	0.40	0.53
CD (0.05)	NS	NS	NS	2.74	2.39	NS	0.91	NS
CV (%)	1.12	10.40	1.10	5.52	6.70	25.02	3.19	25.43

**Table 158:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), weight of rotten tubers (t/ha), tuber dry matter (%) and chip colour (1-5 scale) in 90 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)	Chip colour (1-5 scale)
MP/4-816	97.00	3.74	96.00	31.74	25.55	0.65	17.97	2.67
MP/01-916	97.67	4.04	95.33	30.03	25.15	0.69	18.73	2.00
Atlantic	97.00	4.04	96.00	28.26	22.63	0.62	16.27	2.33
K Chipsona-1	97.00	3.96	94.00	27.55	21.70	0.65	16.07	2.00
K Chipsona-3	97.00	3.89	96.00	26.37	19.81	0.65	16.87	2.33
K Surya	97.00	4.30	94.00	24.92	18.30	0.44	15.90	2.00
SEd	0.83	0.37	1.41	1.34	1.18	0.12	0.43	0.36
CD (0.05)	NS	NS	NS	3.03	2.66	NS	0.97	NS
CV (%)	1.04	11.28	1.82	5.85	6.50	23.67	3.10	19.56

**Table 159:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), weight of rotten tubers (t/ha), tuber dry matter (%) and chip colour (1-5 scale) in 110 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)	Chip colour (1-5 scale)
MP/4-816	97.00	3.89	97.67	33.66	28.59	0.52	18.67	3.00
MP/01-916	97.00	3.89	97.67	32.25	27.81	0.57	19.47	2.33
Atlantic	97.00	3.85	98.00	29.44	24.81	0.48	17.07	2.00
K Chipsona-1	96.67	4.04	98.33	28.66	24.00	0.59	16.57	2.33
K Chipsona-3	97.33	3.74	98.00	27.59	22.26	0.78	17.97	2.00
K Surya	96.67	3.74	97.67	27.96	22.59	0.63	17.27	1.67
SEd	1.07	0.11	0.66	1.05	0.76	0.13	0.34	0.36
CD (0.05)	NS	NS	NS	2.37	1.71	NS	0.78	NS
CV (%)	1.35	3.52	0.83	4.31	3.70	26.85	2.36	19.56

**Table 160:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days			110 days		
MP/4-816	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0
MP/01-916	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0
Atlantic	4.0	0.0	0.0	4.0	0.0	0.0	6.0	0.0	0.0
K Chipsona-1	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0
K Chipsona-3	5.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0
K Surya	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0

**PATNA**

**Table 161:** Plant emergence (%), foliage senescence (%), total & processing grade tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-816	88.67	65.83	23.85	21.83	18.83
MP/9-901	84.67	64.00	24.97	22.09	18.67
MP/01-916	81.83	64.00	26.74	24.38	22.17
Atlantic	84.33	63.58	31.21	22.69	20.50
K Chipsona-1	82.47	63.67	28.09	23.30	22.00
K Chipsona-3	82.33	64.00	28.55	22.13	22.10
SEd	1.55	1.81	2.70	4.10	0.45
CD (0.05)	3.51	NS	NS	NS	1.03
CV (%)	2.26	3.46	12.15	22.07	2.69

**Table 162:** Plant emergence (%), foliage senescence (%), total & processing grade tuber yield (t/ha) dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Tuber Dry matter (%)
MP/4-816	94.68	70.30	25.47	23.30	20.11
MP/9-901	90.41	68.34	26.67	23.59	19.93
MP/01-916	87.38	68.34	28.56	26.03	23.67
Atlantic	90.05	67.89	33.32	24.22	21.89
K Chipsona-1	88.06	67.98	29.99	24.88	23.49
K Chipsona-3	87.91	68.34	30.49	23.63	23.60
SEd	1.66	1.93	2.89	4.37	0.49
CD (0.05)	3.75	NS	NS	NS	1.10
CV (%)	2.27	3.46	12.15	22.06	2.69

**Table 163:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
MP/4-816	Did not appear		2	Did not appear		2
MP/9-901			3			2
MP/01-916			0			0
Atlantic			1			1
K Chipsona-1			1			2
K Chipsona-3			1			3

**Table 164:** Total weight loss after 3 months storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (90 days)		Number basis	Weight basis	
MP/4-816	< 6 weeks	22.70	0.00	0.00	49.42	48.79	55.30
MP/9-901	< 6 weeks	4.62	0.00	0.00	56.02	57.82	68.26
MP/01-916	> 6 weeks	0.00	0.98	0.03	47.40	52.60	62.10
Atlantic	> 6 weeks	0.00	0.00	0.00	49.22	50.94	57.50
K Chipsona-1	> 6 weeks	0.00	2.18	0.15	43.84	42.02	48.78
K Chipsona-3	< 6 weeks	2.24	1.07	0.06	45.21	48.93	55.58

## PASIGHAT

**Table 165:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), weight of rotten tubers (t/ha), tuber dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MP/4-816	91.11	2.04	77.33	29.26	11.85	1.93	20.48
MP/01-916	92.59	2.11	79.00	31.11	14.44	1.63	23.11
Atlantic	90.74	1.82	79.33	25.92	12.96	1.56	21.24
K Chipsona-1	90.74	1.82	82.67	27.40	13.33	1.55	22.06
K Chipsona-3	92.96	2.07	83.00	29.26	17.04	1.37	21.66
SEd	2.08	0.18	4.12	2.48	1.81	0.30	1.45
CD (0.05)	NS	NS	NS	NS	NS	NS	NS
CV (%)	2.78	11.26	6.29	10.63	15.93	23.16	8.20

**Table 166:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha), weight of rotten tubers (t/ha), tuber dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MP/4-816	90.37	1.81	85.33	33.70	14.07	2.22	20.82
MP/01-916	92.96	1.85	88.00	36.29	16.67	2.04	24.84
Atlantic	90.00	1.81	85.33	27.40	13.70	1.85	20.69
K Chipsona-1	90.74	1.85	88.33	31.48	15.55	1.85	21.33
K Chipsona-3	90.74	1.93	82.67	33.70	16.67	1.59	22.29
SEd	2.83	0.25	5.90	3.60	2.09	0.39	1.31
CD (0.05)	NS	NS	NS	NS	NS	NS	NS
CV (%)	3.81	16.80	8.41	13.54	16.72	24.85	7.30

**Table 167:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	75 days			90 days		
MP/4-816	4.1	3.5	3.1	5.5	3.8	4.1
MP/01-916	3.8	3.7	1.8	4.2	4.6	3.7
Atlantic	2.7	3.2	2.9	3.5	4.3	3.9
K Chipsona-1	4.0	3.9	3.7	4.4	4.1	5.2
K Chipsona-3	1.8	0.0	2.2	2.7	0.0	3.4

**Table 168:** Total weight loss after 3 months storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (90days)		Number basis	Weight basis	
MP/4-816	> 6 weeks	0	6.4	3.1	8.6	7.5	9.1
MP/01-916	> 6 weeks	0	4.5	2.4	6.3	7.8	8.7
Atlantic	> 6 weeks	0	5.3	2.7	6.9	8	9.6
K Chipsona-1	> 6 weeks	0	5.7	2.9	7.3	8.4	8.2
K Chipsona-3	> 6 weeks	0	4.1	2.2	6.8	6.3	7.9

**PUNE**

**Table 169:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Mkt. tuber yield (t/ha)	Weight of rotten tubers (t/ha)
MP/4-816	94.22	3.64	73.50	12.00	11.30	0.70
MP/9-901	93.22	3.54	69.17	11.61	10.55	1.05
MP/01-916	94.00	3.31	73.00	11.82	10.85	0.96
Atlantic	93.00	3.78	67.83	11.39	10.37	1.02
K Chipsona-1	93.33	4.20	72.83	13.11	12.19	0.93
K Chipsona-3	93.67	4.05	71.00	12.06	10.92	1.13
K Surya	92.67	3.87	71.83	11.93	10.89	1.04
SEd	1.58	0.08	2.71	0.52	0.55	0.12
CD (0.05)	NS	0.18	NS	NS	NS	NS
CV (%)	2.07	2.68	4.66	5.28	6.07	15.07

**Table 170:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Mkt. tuber yield (t/ha)	Weight of rotten tubers (t/ha)
MP/4-816	93.67	3.72	80.67	14.54	13.55	0.98
MP/9-901	92.33	3.67	78.67	13.05	11.96	1.09
MP/01-916	93.44	3.26	80.77	12.31	11.11	1.20
Atlantic	91.89	3.84	81.44	11.98	10.78	1.20
K Chipsona-1	93.00	3.58	78.67	13.77	12.54	1.24
K Chipsona-3	92.67	3.54	79.00	12.80	11.48	1.31
K Surya	93.67	3.43	82.00	13.13	11.67	1.46
SEd	1.59	0.18	2.63	0.52	0.51	0.10
CD (0.05)	NS	NS	NS	1.13	1.12	0.23
CV (%)	2.10	6.27	4.01	4.82	5.23	10.37

**Table 171:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
MP/4-816	9.33	32.00	1.00	12.00	38.67	5.33
MP/9-901	5.33	17.33	2.67	8.00	20.00	2.67
MP/01-916	8.00	20.00	5.33	8.00	20.00	1.33
Atlantic	6.67	22.67	5.33	6.67	25.33	5.33
K Chipsona-1	8.00	22.67	0.00	13.33	29.33	6.67
K Chipsona-3	4.00	26.67	6.67	12.00	32.00	4.00
K Surya	5.33	24.00	6.67	9.33	36.00	8.00

**Table 172:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (90days)		Number basis	Weight basis	
MP/4-816	>6weeks	0.00	0.00	0.00	1.90	1.28	9.95
MP/9-901	>6weeks	0.00	0.00	0.00	3.43	2.32	11.10
MP/01-916	>6weeks	0.00	0.00	0.00	5.60	4.12	14.12
Atlantic	>6weeks	0.00	0.00	0.00	10.90	10.00	17.30
K Chipsona-1	>6weeks	0.00	0.00	0.00	7.25	6.30	15.20
K Chipsona-3	>6weeks	0.00	0.00	0.00	5.10	3.90	14.10
K Surya	>6weeks	0.00	0.00	0.00	9.85	10.45	17.00



## RAIPUR

**Table 173:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade tuber yield (t/ha) and weight of rotten tubers (t/ha) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)
MP/4-816	83.98	3.73	26.44	14.50	2.23	0.27
MP/01-916	91.68	3.76	24.18	26.85	1.78	0.32
Atlantic	94.33	3.86	22.05	21.12	1.86	0.75
K Chipsona-1	92.00	3.79	25.17	24.36	0.94	0.77
K Chipsona-3	89.65	3.97	21.13	28.84	3.10	0.43
K Surya	95.68	3.88	22.60	24.45	3.21	0.24
SEd	2.53	0.13	2.67	0.48	0.22	0.11
CD (0.05)	5.44	NS	NS	1.03	0.46	0.23
CV (%)	3.92	4.86	16.00	2.90	13.94	32.36

**Table 174:** Foliage senescence (%), total & processing grade tuber yield (t/ha) and weight of rotten tubers (t/ha) in 90 & 110 days crop.

Hybrid/variety	Foliage senescence (%)	Total yield (t/ha)	Processing grade tuber yield (t/ha)	Weight of rotten tubers (t/ha)	90 days		110 days	
					Foliage senescence (%)	Total yield (t/ha)	Processing grade tuber yield (t/ha)	Weight of rotten tubers (t/ha)
MP/4-816	92.75	21.37	3.34	0.14	99.98	23.67	7.50	0.70
MP/01-916	97.75	22.09	4.01	0.22	100.00	26.86	3.85	0.56
Atlantic	95.75	17.18	1.21	0.72	99.98	21.12	2.27	1.14
K Chip-1	86.25	21.80	2.33	1.43	100.00	24.36	6.12	1.45
K Chip-3	87.75	26.70	2.39	1.18	99.98	28.84	4.82	2.17
K Surya	87.75	23.22	2.47	0.22	100.00	24.45	6.14	0.67
SEd	2.18	0.50	0.16	0.11	0.04	0.55	0.15	0.32
CD (0.05)	4.69	1.07	0.35	0.23	NS	1.19	0.31	0.68
CV (%)	3.38	3.18	8.64	22.80	0.06	3.13	4.00	40.32

**Table 175:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days			110 days		
MP/4-816	0.0	0.0	0.0	0.0	17.1	13.7	0.0	19.1	15.7
MP/01-916	0.0	0.0	0.0	0.0	8.1	15.7	0.0	10.1	17.7
Atlantic	0.0	0.0	0.0	0.0	19.1	23.7	0.0	21.1	25.7
K Chip-1	0.0	0.0	0.0	0.0	21.1	17.7	0.0	23.1	19.7
K Chip-3	0.0	0.0	0.0	0.0	14.1	10.7	0.0	16.1	12.7
K Surya	0.0	0.0	0.0	0.0	16.1	19.7	0.0	18.1	21.7

**Table 176:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90days)		Number basis	Weight basis	
MP/4-816	>6weeks	Nil	Nil	0	20.0	20.0	21.7
MP/01-916	>6weeks	Nil	Nil	0	20.0	20.4	22.4
Atlantic	>6weeks	Nil	Nil	0	30.0	29.2	30.6
K Chipsona-1	>6weeks	Nil	Nil	0	20.0	21.0	22.6
K Chipsona-3	>6weeks	Nil	Nil	0	30.0	30.5	32.1
K Surya	>6weeks	Nil	Nil	0	40.0	41.6	43.1

**POOLED OVER THE YEAR (2015-16 & 2016-17)**

**Table 176.1:** Yield (t/ha) performance under northern plains (HIS & MDP) at 75 days

Hybrid/variety	HIS	MDP	Mean	HIS	MDP	Mean
	Total yield (t/ha)			Marketable yield (t/ha)		
MP/4-816	23.39	23.66	23.52	18.63	17.17	17.90
MP/9-901	27.08	22.91	25.00	24.51	17.90	21.21
K Chip-4	19.86	23.96	21.91	17.99	18.18	18.09
Atlantic	17.36	21.85	19.61	16.25	17.62	16.94
K Chip-1	16.38	24.11	20.24	11.34	16.54	13.94
K Chip-3	27.45	24.64	26.04	24.05	17.41	20.73
Mean B	21.92	23.52		18.80	17.47	
CD (5%)	Location(B)=0.76; Genotype(C)=1.32; Interaction B X C=1.87			Location (B)=0.65; Genotype (C)=1.13; Interaction B X C=1.59		

**Table 176.2:** Yield (t/ha) performance under northern plains (HIS & MDP) at 90 days

Hybrid/variety	HIS	MDP	Mean	HIS	MDP	Mean
	Total yield (t/ha)			Marketable yield (t/ha)		
MP/4-816	32.43	33.32	32.87	25.80	25.08	25.44
MP/9-901	35.10	33.51	34.31	31.99	27.72	29.85
K Chip-4	28.75	33.93	31.34	25.79	27.80	26.79
Atlantic	24.72	29.31	27.02	23.16	25.01	24.08
K Chip-1	27.97	35.02	31.49	22.73	26.21	24.47
K Chip-3	32.32	34.48	33.40	28.11	27.43	27.77
Mean B	30.22	33.26		26.26	26.54	
CD (5%)	Location(B)=1.09; Genotype(C)=1.90; Interaction B X C=2.69			Location (B)=NS; Genotype (C)=1.83; Interaction B X C=2.59		

**Table 176.3:** Yield (t/ha) performance under northern plains (HIS, MDP & PNT) at 110 days

Hybrid/variety	HIS	MDP	PNT	Mean	HIS	MDP	PNT	Mean
	Total yield (t/ha)				Marketable yield (t/ha)			
MP/4-816	45.90	46.48	30.76	41.04	38.25	39.15	27.50	34.96
K Chip-4	40.95	41.32	28.90	37.06	37.32	35.07	26.15	32.85
Atlantic	31.32	36.14	26.48	31.31	29.04	32.31	21.40	27.58
K Chip-1	37.85	40.69	26.50	35.01	30.85	33.31	23.24	29.13
K Chip-3	39.20	42.96	25.63	35.93	32.47	36.35	22.28	30.37
Mean B	39.04	41.52	27.65		33.58	35.24	24.11	
CD (5%)	Location (B)=0.97; Genotype (C)=1.25; Interaction B X C=2.17				Location (B)=0.89; Genotype (C)=1.16; Interaction B X C=2.00			

**Table 176.4:** Yield (t/ha) performance under central plains (CHN, GWL, RPR) at 75 days

Hybrid/variety	CHN	GWL	RPR	Mean	CHN	GWL	RPR	Mean
	Total yield (t/ha)				Marketable yield (t/ha)			
MP/4-816	27.44	23.43	11.37	20.75	17.16	10.38	4.01	10.52
K Chip-4	27.33	29.49	19.29	25.37	17.05	12.95	5.25	11.75
K Chip-1	30.25	24.13	16.58	23.65	19.27	11.45	4.02	11.58
K Chip-3	27.93	26.12	16.53	23.53	17.43	11.82	3.21	10.82
Mean B	28.24	25.79	15.94		17.73	11.65	4.12	
CD (5%)	Location (B)=1.15; Genotype (C)=1.33; Interaction B X C=2.30				Location (B)=0.68; Genotype (C)=0.78; Interaction B X C=1.35			

**Table 176.5:** Yield (t/ha) performance under central plains (CHN, DES, GWL, KTT & RPR) at 90 days

Hybrid/variety	CHN	DES	GWL	KTT	RPR	Mean	CHN	DES	GWL	KTT	RPR	Mean
	Total yield (t/ha)						Marketable yield (t/ha)					
MP/4-816	33.29	29.20	29.00	12.98	18.27	24.55	23.50	16.95	11.10	11.48	7.54	14.11
K Chip-4	32.87	29.55	34.29	15.02	18.92	26.13	23.29	21.60	13.78	13.65	7.90	16.05
K Chip-1	34.04	34.54	32.17	11.96	17.43	26.03	24.07	24.03	13.75	10.20	6.32	15.67

K Chip-3	29.49	39.97	32.14	11.57	19.36	26.51	20.89	32.42	13.93	10.52	4.96	16.55
Mean B	32.42	33.32	31.90	12.88	18.50		22.94	23.75	13.14	11.46	6.68	
CD (5%)	Location (B)=1.41; Genotype (C)=1.26; Interaction B X C=2.81						Location (B)=1.04; Genotype (C)=0.93; Interaction B X C=2.09					

**Table 176.6:** Yield (t/ha) performance under central plains (CHN, DES, GWL & RPR) at 110 days

Hybrid/variety	CHN	DES	GWL	RPR	Mean	CHN	DES	GWL	RPR	Mean	
	MP/4-816	35.88	32.73	36.01	21.05	31.42	28.52	23.94	13.56	10.85	19.22
K Chip-4	34.74	35.57	39.86	22.40	33.14	27.62	26.73	14.88	8.64	19.47	
K Chip-1	35.61	39.62	35.36	23.37	33.49	28.31	31.07	14.78	12.83	21.75	
K Chip-3	32.55	47.63	38.68	23.43	35.57	25.87	41.09	14.96	10.38	23.08	
Mean B	34.70	38.89	37.48	22.56		27.58	30.71	14.54	10.67		
CD (5%)	Location (B)=1.69; Genotype (C)=1.69; Interaction B X C=3.38					Location (B)=1.06; Genotype (C)=1.06; Interaction B X C=2.12					

**Table 176.7:** Dry matter (%) performance in central plains (CHN, DES, GWL & KTT) at 90 days

Hybrid/variety	CHN	DES	GWL	KTT	Mean
MP/4-816	18.34	19.89	24.68	21.10	21.00
K Chip-4	18.38	22.57	24.36	21.02	21.58
K Chip-1	18.63	19.63	24.74	20.96	20.99
K Chip-3	18.58	20.85	23.28	20.29	20.75
Mean B	18.48	20.73	24.26	20.84	
CD (5%)	Location (B)=0.55; Genotype (C)=0.55; Interaction B X C=1.09				

**Table 176.8:** Yield (t/ha) performance under eastern plains (BHN & KAL) at 75 days

Hybrid/variety	BHN	KAL	Mean	BHN	KAL	Mean
	Total yield (t/ha)			Marketable yield (t/ha)		
MP/4-816	11.71	26.67	19.19	10.38	25.43	17.90
K Chip-4	13.64	26.62	20.13	12.83	25.67	19.25
Atlantic	16.34	23.31	19.82	15.37	22.61	18.99
K Chip-1	14.62	26.87	20.74	13.59	26.09	19.84
K Chip-3	14.03	23.98	19.00	12.80	22.76	17.78
Mean B	14.07	25.49		12.99	24.51	
CD (5%)	Location(B)=0.68; Genotype(C)=1.08; Interaction B X C=1.53			Location (B)=0.69; Genotype (C)=1.09; Interaction B X C=1.54		

**Table 176.9:** Yield (t/ha) performance under eastern plains (JRH & KAL) at 75 days

Hybrid/variety	JRH	KAL	Mean	JRH	KAL	Mean
	Total yield (t/ha)			Marketable yield (t/ha)		
MP/9-901	14.18	21.56	17.87	11.63	20.86	16.25
K Chip-4	10.30	26.62	18.46	7.91	25.67	16.79
Atlantic	11.51	23.31	17.41	8.98	22.61	15.80
K Chip-1	12.06	26.87	19.46	9.57	26.09	17.83
K Chip-3	11.60	23.98	17.79	9.12	22.76	15.94
Mean B	11.93	24.47		9.44	23.60	
CD (5%)	Location(B)=0.68; Genotype(C)=1.08; Interaction B X C=1.53			Location (B)=0.67; Genotype (C)=1.07; Interaction B X C=1.51		

**Table 176.10:** Yield (t/ha) performance under eastern plains (BHN, DHL, FZB & KAL) at 90 days

Hybrid/variety	BHN	DHL	FZB	KAL	Mean	BHN	DHL	FZB	KAL	Mean
	MP/4-816	12.50	8.82	28.25	29.40	19.74	11.10	7.36	23.85	28.79
K Chip-4	13.60	7.76	26.80	30.01	19.54	13.02	6.75	22.60	29.59	17.99

Atlantic	12.53	5.63	25.29	26.87	17.58	12.09	4.57	21.33	26.42	16.10
K Chip-1	13.54	6.62	26.73	29.92	19.20	12.59	5.52	22.44	29.26	17.45
K Chip-3	14.22	7.40	25.33	26.48	18.36	13.11	6.49	21.35	25.53	16.62
Mean B	13.28	7.25	26.48	28.53		12.38	6.14	22.31	27.92	
CD (5%)	Location (B)=0.56; Genotype (C)=0.63; Interaction B X C=1.26					Location (B)=0.53; Genotype (C)=0.59; Interaction B X C=1.19				

**Table 176.11:** Dry matter (%) performance in central plains (BHN, DHL, FZB & KAL) at 90 days

Hybrid/variety	BHN	DHL	FZB	KAL	Mean
MP/4-816	20.16	20.27	20.09	20.57	20.27
K Chip-4	21.25	18.71	20.07	19.86	19.97
Atlantic	19.06	21.18	19.93	20.15	20.08
K Chip-1	19.84	18.82	19.89	20.35	19.72
K Chip-3	18.63	19.96	20.13	19.97	19.67
Mean B	19.79	19.79	20.02	20.18	
CD (5%)	Location (B)=0.17; Genotype (C)=1.84; Interaction B X C=0.36				

**Table 176.12:** Yield (t/ha) and dry matter (%) performance under eastern plains (JRH & KAL) at 90 days

Hybrid/variety	JRH	KAL	Mean	JRH	KAL	Mean	JRH	KAL	Mean
	Total yield (t/ha)			Marketable yield (t/ha)			Dry matter (%)		
MP/9-901	17.55	25.37	21.46	14.84	24.81	19.82	18.15	18.43	18.29
K Chip-4	15.04	30.01	22.52	11.86	29.59	20.72	20.23	19.86	20.05
Atlantic	16.63	26.87	21.75	12.84	26.42	19.63	18.82	20.15	19.48
K Chip-1	16.10	29.92	23.01	12.94	29.26	21.10	20.02	20.35	20.19
K Chip-3	16.29	26.48	21.38	13.09	25.53	19.31	19.83	19.97	19.90
Mean B	16.32	27.73		13.11	27.12		19.41	19.75	
CD (5%)	Location(B)=0.58; Genotype(C)=0.92; Interaction B X C=1.30			Location (B)=0.55; Genotype (C)=0.87; Interaction B X C=1.24			Location (B)=0.24; Genotype (C)=0.37; Interaction B X C=0.53		

**Table 176.13:** Yield (t/ha) performance and dry matter (%) under eastern plains (FZB & KAL) at 110 days

Hybrid/variety	FZB	KAL	Mean	FZB	KAL	Mean	FZB	KAL	Mean
	Total yield (t/ha)			Marketable yield (t/ha)			Dry matter (%)		
MP/4-816	32.72	31.31	32.02	28.05	30.40	29.22	20.48	20.97	20.72
K Chip-4	30.68	32.71	31.69	26.30	31.96	29.13	20.46	19.47	19.97
Atlantic	29.06	30.18	29.62	24.92	29.93	27.42	20.34	21.24	20.79
K Chip-1	30.56	32.63	31.60	26.48	32.07	29.27	20.30	21.80	21.05
K Chip-3	29.00	29.42	29.21	23.45	28.38	25.92	20.54	20.73	20.63
Mean B	30.40	31.25		25.84	30.55		20.43	20.84	
CD (5%)	Location(B)=0.65; Genotype(C)=1.03; Interaction B X C=1.46			Location (B)=0.75; Genotype (C)=1.19; Interaction B X C=1.68			Location (B)=0.10; Genotype (C)=0.16; Interaction B X C=0.23		

**Table 176.14:** Yield (t/ha) performance and dry matter (%) under eastern plains at Kalyani in 110 days

Hybrid/variety	2015-16	2016-17	Mean	2015-16	2016-17	Mean	2015-16	2016-17	Mean
	Total yield (t/ha)			Marketable yield (t/ha)			Dry matter (%)		
MP/4-816	30.12	32.51	31.31	29.73	31.06	30.40	19.53	22.40	20.97
MP/9-901	26.95	31.36	29.15	26.62	30.32	28.47	15.93	22.92	19.43
K Chip-4	30.01	35.42	32.71	29.73	34.18	31.96	18.30	20.64	19.47
Atlantic	27.67	32.68	30.18	27.45	32.41	29.93	19.47	23.02	21.24
K Chip-1	29.23	36.04	32.63	28.95	35.18	32.07	21.40	22.20	21.80
K Chip-3	29.28	29.56	29.42	28.45	28.31	28.38	18.50	22.95	20.73
Mean B	28.88	32.93		28.49	31.91		18.86	22.36	
CD (5%)	Year(A)=0.76; Genotype(B)=1.32; Interaction A X B =1.86			Year(A)=0.67; Genotype(B)=1.15; Interaction A X B =1.63			Year(A)=0.16; Genotype(B)=0.26; Interaction A X B =0.37		

## GENET. 8: ON-FARM TRIAL WITH PROCESSING HYBRIDS

On-farm trials with two processing hybrid, MP/4-578 and MP/6-39 with controls viz., Kufri Chiosona-1, Kufri Chipsona-3, Kufri Frysona and Atlantic were conducted at 32 locations across 17 AICRP (P) centres viz., Bhubaneswar, Chhindwara, Deesa, Faizabad, Gwalior, Hisar, Jalandhar, Jorhat, Kalyani, Kanpur, Kota, Modipuram, Pantnagar, Pasighat, Patna, Pune and Raipur. The trial was conducted for only 90 days crop durations at 3 locations viz., Bhubaneshwar, Deesa and Pune while at all other locations it was evaluated at 110 days duration also, except at Gwalior where the crop was evaluated at 75 days crop duration too. At Patna, the evaluation was done for 110 days crop duration only. Plant emergence was normal at all locations except for hybrid MP/4-578 at Kalyani (12.50 & 13.20%) and Raipur (74%) during 90 and 110 days crop duration. The control varieties viz., Atlantic and Chipsona too observed less than 80 per cent emergence at Raipur.

Kufri Chipsona-1 was the best control for both total and process grade yields at Bhubaneswar, Chhindwara, Faizabad, Hisar, Kanpur; Kufri Chipsona-3 was the best control at Kota, Patna, Raipur and Modipuram; Kufri Frysona was the best control at Pasighat and Raipur; Atlantic at Jalandhar, Kalyani, Pune and Pantnagar at all crop durations. At Gwalior and Jorhat, different checks appeared to be the best controls at different crop durations. Hybrid, MP/4-578 yielded higher than the best control at Chhindwara, Deesa (90 days crop duration), Faizabad, Hisar, Kanpur, Modipuram, Pantnagar and Pune for both total and process grade yields. The other hybrid MP/6-39 outyielded best control at Deesa, Kanpur, Modipuram (110 days crop duration), Pantnagar and Pune.

The dry matter content (%) of hybrids was at par to best control at Chhindwara, Faizabad, Gwalior (90 & 110 days crop duration), Jalandhar (110 days crop duration), Jorhat (110 days crop duration), Kalyani and Modipuram. The hybrid, MP/04-578 recorded higher dry matter content at Gwalior (21.48% at 75 days crop duration), Kota (23.10%) and Pantnagar (17.33%). The hybrid MP/6-39 too recorded higher dry matter at Gwalior (75 days crop duration), Jorhat (110 days crop duration) and Pune. Chip colour was also recorded at Chhindwara, Jalandhar and Pantnagar while reducing sugars after harvest was observed only at Jalandhar location. K. Chipsona-1 was the best control for chip colour at Chhindwarwa whereas Atlantic was best at Jalandhar and Pantnagar. For reducing sugars Atlantic was the best among all hybrids and control varieties. In both the hybrids, reducing sugar content was high (>100 mg/100 g Fr.wt.).

Late blight incidence was low at Pasighat (1.5-4.8%), Pantnagar (4-6%); moderate at Kalyani (6.5-12.5%), Pune (6.67-14.67), Kanpur (9-15%), Jorhat (13.0-21.5%); moderate to high at Faizabad (20-50%) in all hybrids and controls during all crop durations. The late blight disease did not appear at all other centres. Viral disease incidence was low at all centres except Faizabad (4-10%), Jalandhar (10-20%), Jorhat (9.5-14.5%), Kalyani (8.3-11.5%), Kanpur (5-12%), Kota (2.5-14.0%), Raipur (14-27%). Storage studies showed that the hybrid, MP/4-578 recorded less weight loss than best control variety at Pune, at par weight loss to the best control at Deesa, Faizabad, Pasighat. However, at Kanpur, MP/4-578 recorded higher weight loss than the best control variety. The other hybrid, MP/6-39 recorded at par or higher weight loss to the best control variety at the tested locations.

The data over locations was pooled for different zones. In the eastern zone the data was pooled over 3 locations viz., Bhubaneshwar, Faizabad and Kalyani for 90 crop duration and 110 days for Faizabad, Kalyani and Patna. The yield and dry matter (%) differences among genotypes were non-significant and Kufri Chipsona-1 recorded the highest yield at both crop durations. In central plains also data was pooled over 4 locations viz., Chhindwara, Deesa, Kota and Raipur for 90 crop duration and 110 days for all locations except Kota. The yield and dry matter (%) differences among genotypes were non-significant. In northern plains the data was pooled over 2 locations viz., Hisar and Modipuram for both 90 and 110 days crop durations. The yield and dry matter (%) differences among genotypes were non-significant. Kufri Chipsona-1 was the best control for total tuber yield while Kufri Frysona was the best for French Fry grade yield. Hybrid, MP/04-578 yielded higher total and French Fry grade yield at 90 and 110 days crop durations.

**Table 177:** Experimental details

Experimental detail/Centre	BHN	CHN	DES	FZB	GWL
Year	2016-17	2016-17	2016-17	2016-17	2016-17
Replication/Location	1L	4L	1L	1L	3L
Plot size (m <sup>2</sup> )	9.90	96.00	30.00	48.00	45.00
Spacing (cm)	66X25	60x20	60x25	60x25	60x20
Planting date	23.11.16	08.11.16	13.11.16	16-17-20.11.16	07.11.16
Dehauling date	75 DAP	-	-	-	22.01.17
	90 DAP	13.02.17	08.02.17	11.02.17	14,15,18.02.17
	110 DAP	-	20.02.17	-	06,07,10.03.17
Harvesting date	75 DAP	-	-	-	05.02.17
	90 DAP	19.02.17	04.03.17	05.03.17	24,26,27.02.17
	110 DAP	-	04.03.17	-	14,15,16.03.17
N:P:K dose	150:80:100	120:100:100	421.5:138:412.5	150: 100:120	150: 100:120
Duration of crop (days)	90	90 &110	90 &110	90 &110	90 &110

Contd.....

Experimental detail/Centre	HIS	JAL	JRH	KAL	KAN
Year	2016-17	2016-17	2016-17	2016-17	2016-17
Replication/Location	2L	1L	3L	1L	4L
Plot size (m <sup>2</sup> )	96.00	48.00	96.00	36.00	96.00
Spacing (cm)	60x20	60x20	66X25	60x20	60x25
Planting date	19.10.16	14.10.16	20.11.16	09.12.16	08,09.11.16
Dehauling date	90 DAP	20.01.17	12.01.17	20.02.17	12.03.17
	110 DAP	10.02.17	01.02.17	22.02.17	31.01.17
Harvesting date	90 DAP	02.03.17	07.02.17	27.02.17	22.03.17
	110 DAP	02.03.17	08.03.17	01.03.17	10.04.17
N:P:K dose	200:75:150	240:100:150	120:100:100	200:150:150	-
Duration of crop (days)	90 &110	90 &110	90	90 &110	90 &110

Contd.....

Experimental detail/Centre	MDP	PNT	PAS	PAT	PUN	RPR
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Replication/Location	1L	3L	1L	2L	1L	4L
Plot size (m <sup>2</sup> )	39.60	96.00	48.00	48.60	36.00	96.00
Spacing (cm)	66x20	60x20	60x20	66X25	60x25	60x25
Planting date	23.10.16	22,24.10.16	04.11.16	19.11.16	07.11.16	13.11.16
Dehauling date	90 DAP	21.01.17	22,24.01.17	30.01.17	-	08.02.17
	110 DAP	10.02.17	12,14.02.17	12.02.17	09.03.17	-
Harvesting date	90 DAP	20.02.17	02,04.02.17	05.02.17	-	15.02.17
	110 DAP	20.02.17	22,25.02.17	25.02.17	16.03.17	-
N:P:K dose	270.80.150	160:100:100	150:120:100	-	225:60:180	150:100:100
Duration of crop (days)	90 &110	90 &110	90 &110	110	90	90 &110

**BHUBANESWAR****Table 178:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & processing grade yield (t/ha) and tuber rottage (t/ha) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Tuber rottage (t/ha)
MP/4-578	89.00	2.43	92.00	21.03	19.64	0.85
MP/6-39	94.00	2.51	87.00	22.76	21.34	1.05
Atlantic	96.00	2.18	86.00	22.12	20.79	0.99
K Chipsona-1	95.00	2.13	94.00	24.69	23.37	0.72
K Chipsona-3	94.00	2.59	87.00	22.34	21.69	0.74
K Frysona	90.00	2.43	88.00	20.79	20.04	0.85

## CHHINDWARA

**Table 179:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha), dry matter (%) and chip colour in 90 days crop.

Hybrid/variety	Emergence (%)	Seed wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable grade yield (t/ha)	Dry matter (%)	Chip colour
MP/4-578	91.75	4.52	83.75	35.91	33.80	18.65	3.35
MP/6-39	92.25	5.36	82.25	29.64	27.56	18.18	4.36
Atlantic	94.25	4.39	84.50	30.48	28.60	18.18	4.35
K Chipsona-1	92.75	4.52	81.25	34.37	32.42	17.18	2.20
K Chipsona-3	93.50	4.60	82.75	33.02	31.10	18.13	5.23
K Frysona	93.00	5.36	81.50	31.98	30.37	18.63	3.63

**Table 180:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha), dry matter (%) and chip colour in 110 days crop.

Hybrid/variety	Emergence (%)	Seed wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable grade yield (t/ha)	Dry matter (%)	Chip colour
MP/4-578	91.75	4.47	93.75	38.79	37.13	19.13	3.08
MP/6-39	91.75	5.28	93.75	30.68	29.02	19.13	4.13
Atlantic	93.00	4.73	94.50	31.62	29.95	19.15	4.20
K Chipsona-1	93.00	4.24	91.25	36.53	34.84	18.60	2.10
K Chipsona-3	93.50	4.52	92.25	35.39	33.70	19.15	5.18
K Frysona	91.50	5.30	91.25	33.28	31.62	18.93	3.50

**Table 181:** Disease reaction

Hybrid/variety	Late blight (%)	Early Blight (%)	Viral disease (%)	Late blight (%)	Early Blight (%)	Viral disease (%)
	90 days			110 days		
MP/4-578	Did not appear	1.0	1.0	Did not appear	1.2	2.0
MP/6-39		1.3	2.0		2.0	2.4
Atlantic		1.5	2.3		2.3	2.5
K Chipsona-1		1.7	2.2		2.6	2.2
K Chipsona-3		1.3	2.1		2.1	2.6
K Frysona		1.5	1.3		2.5	2.6

## DEESA

**Table 182:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
MP/4-578	90.00	4.38	4.00	20.00	17.01	23.27
MP/6-39	86.00	4.35	4.00	29.85	24.38	20.80
Atlantic	100.00	4.55	4.00	19.87	14.00	19.93
K Chipsona-1	90.50	4.56	4.50	23.19	13.42	20.80
K Chipsona-3	96.50	4.61	4.00	25.67	13.59	21.80
K Frysona	85.50	4.57	4.00	22.22	13.60	24.27

**Table 183:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
MP/4-578	90.00	4.36	5.00	24.01	20.97	23.73
MP/6-39	89.00	4.38	5.00	34.23	27.40	20.88
Atlantic	94.00	4.55	5.00	23.38	17.70	21.53
K Chipsona-1	85.50	4.52	5.00	25.24	17.93	21.03
K Chipsona-3	95.50	4.64	5.00	32.50	22.59	21.87
K Frysona	86.00	4.60	5.00	26.10	16.10	26.20

**Table 184:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	90 days			110 days		
MP/4-578	Did not appear	8.3	3.0	Did not appear	9.3	4.1
MP/6-39		9.9	2.9		10.1	3.0
Atlantic		8.0	5.0		8.9	5.7
K Chipsona-1		6.1	2.8		6.7	3.7
K Chipsona-3		1.6	0.0		2.7	2.9
K Frysona		2.9	2.9		3.9	3.8

**Table 185:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 75 days)		Number basis	Weight basis	
MP/4-578	> 6 weeks	0.0	0.0	0.0	4.6	3.0	11.4
MP/6-39	> 6 weeks	0.0	0.0	0.0	17.8	18.4	26.1
Atlantic	> 6 weeks	0.0	0.0	0.0	2.7	1.6	10.8
K Chipsona-1	> 6 weeks	0.0	0.0	0.0	2.3	1.6	10.1
K Chipsona-3	> 6 weeks	0.0	3.8	0.0	4.9	4.1	12.0
K Frysona	> 6 weeks	0.0	0.0	0.0	6.7	5.2	15.4

## FAIZABAD

**Table 186:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha), tuber rottage (t/ha) and dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
MP/4-578	91.08	3.73	63.33	35.44	31.20	1.03	20.93
MP/6-39	91.83	3.74	66.67	31.95	28.11	0.96	20.37
Atlantic	92.58	3.73	61.67	30.95	27.24	1.08	20.13
K Chipsona-1	91.00	3.74	61.67	34.94	30.75	0.90	20.57
K Chipsona-3	90.50	3.72	63.33	31.45	27.68	0.87	20.57
K Frysona	92.75	3.66	58.33	32.15	28.29	1.03	20.33

**Table 187:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total and marketable tuber yield (t/ha), tuber rottage (t/ha) and dry matter (%) in 110 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
MP/4-578	91.67	3.76	78.33	38.97	34.67	1.09	21.00



MP/6-39	91.58	3.73	83.33	35.07	31.21	0.99	20.53
Atlantic	92.50	3.70	78.33	34.06	30.37	1.15	20.33
K Chipsona-1	92.58	3.72	78.33	38.40	34.17	1.00	20.73
K Chipsona-3	93.25	3.66	81.67	34.69	30.83	0.94	20.70
K Frysona	91.00	3.73	76.67	35.32	31.42	1.09	20.53

**Table 188:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	90 days			110 days		
MP/4-578	20	10	0	45	15	0
MP/6-39	30	0	4	50	10	10
Atlantic	20	15	0	50	25	5
K Chipsona-1	15	10	5	45	15	5
K Chipsona-3	25	20	5	50	20	10
K Frysona	25	10	10	55	15	10

**Table 189:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 75 days)		Number basis	Weight basis	
MP/4-578	> 6 weeks	20.0	70.0	0.3	7.8	8.6	9.8
MP/6-39	> 6 weeks	25.0	82.0	0.4	8.2	8.7	10.0
Atlantic	> 6 weeks	20.0	75.0	0.6	8.3	9.2	10.2
K Chipsona-1	> 6 weeks	30.0	80.0	0.4	8.1	9.0	10.2
K Chipsona-3	> 6 weeks	25.0	82.0	0.5	8.5	8.8	9.9
K Frysona	> 6 weeks	25.0	84.0	0.6	8.0	8.7	9.7

## GWALIOR

**Table 190:** Plant emergence (%), total & Processing grade yield (t/ha) and dry matter (%) in 75 & 90 days crop.

Hybrid/variety	Emergence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)	Emergence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
	75 days				90 days			
MP/4-578	93.13	24.18	20.11	21.48	93.13	38.20	23.74	22.32
MP/6-39	89.00	30.65	18.67	21.75	89.00	36.97	21.51	22.25
K Chipsona-1	84.85	22.49	19.74	20.09	84.85	34.36	25.32	22.68
K Chipsona-3	87.80	25.25	21.70	19.89	87.80	37.77	26.41	23.30
K Frysona	86.50	28.53	22.46	19.63	86.50	36.20	23.10	20.13
SEd	1.44	1.45	0.65	0.59	1.44	3.68	2.19	0.43
CD (0.05)	3.17	3.19	1.43	1.30	3.17	NS	NS	0.94
CV (%)	2.31	7.81	4.48	4.06	2.31	14.17	12.87	2.73

**Table 191:** Plant emergence (%), total & Processing grade yield (t/ha) and dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Dry matter (%)
MP/4-578	93.13	41.09	26.65	23.18
MP/6-39	89.00	38.17	26.13	22.42
K Chipsona-1	84.85	37.46	25.81	21.38
K Chipsona-3	87.80	39.86	26.83	22.46
K Frysona	86.50	40.79	25.15	20.38

SEd	1.44	2.67	1.61	0.32
CD (0.05)	3.17	NS	NS	0.70
CV (%)	2.31	9.55	8.73	2.04

## HISAR

**Table 192:** Plant emergence (%), seed wt. (t/ha), total and marketable tuber yield (t/ha) in 90 & 110 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)
MP/4-578	95.64	3.76	39.81	36.19	94.23	3.85	46.55	43.25
MP/6-39	95.70	3.28	39.66	36.16	98.32	3.79	46.52	42.85
Atlantic	97.55	4.00	29.46	27.33	94.72	4.07	35.78	32.60
K Chipsona-1	96.07	2.86	34.25	30.27	93.89	2.62	42.28	38.24
K Chipsona-3	95.55	2.95	37.63	32.77	95.64	2.98	43.32	39.06
K Frysona	95.64	2.76	34.31	30.20	97.29	2.83	41.71	36.60

**Table 193:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
MP/4-578	Did not appear	Did not appear	0.25	Did not appear	Did not appear	0.85
MP/6-39			0.00			0.00
Atlantic			0.00			0.00
K Chipsona-1			0.00			0.00
K Chipsona-3			0.50			1.00
K Frysona			0.25			1.50

## JALANDHAR

**Table 194:** Plant emergence (%), seed wt. (t/ha), total & marketable tuber yield (t/ha), dry matter (%), chip colour (1-5 scale) and reducing sugar (% /100 FW) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)	Chip Colour (1-5 scale)	Reducing sugar (% /100 FW)
MP/4-578	94.00	5.41	27.21	18.37	21.10	2.38	111.16
MP/6-39	95.00	5.12	25.52	17.33	20.44	2.38	153.92
Atlantic	93.00	5.89	32.36	20.84	23.56	1.50	78.78
K Chipsona-1	95.00	4.85	30.62	19.18	23.97	1.75	128.42
K Chipsona-3	94.00	4.08	28.50	17.68	21.95	1.75	141.63
K Frysona	94.00	4.58	29.39	18.37	23.88	2.13	129.33

**Table 195:** Plant emergence (%), seed wt. (t/ha), total & marketable tuber yield (t/ha), dry matter (%), chip colour (1-5 scale) and reducing sugar (% /100 FW ) in 110 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)	Chip Colour (1-5 scale)	Reducing sugar (% /100 FW)
MP/4-578	91.00	5.62	30.74	20.55	24.05	1.88	101.55
MP/6-39	92.00	5.10	31.41	21.28	20.48	2.13	116.12
Atlantic	93.00	6.09	34.59	22.30	23.30	1.50	44.17
K Chipsona-1	94.00	4.99	32.24	21.51	24.01	1.50	63.30
K Chipsona-3	96.00	4.16	30.56	19.28	23.09	1.63	75.59
K Frysona	94.00	4.64	31.74	19.64	23.84	2.38	123.41

**Table 196:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	90 days			110 days		
MP/4-578	Did not appear	Did not appear	20	Did not appear	Did not appear	20
MP/6-39			10			15
Atlantic			10			12
K Chipsona-1			20			15
K Chipsona-3			15			15
K Frysona			20			12

**JORHAT****Table 197:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
MP/4-578	93.33	1.14	20.67	13.94	11.89	24.27
MP/6-39	98.00	1.14	26.33	14.29	12.48	22.03
Atlantic	98.00	1.63	11.00	19.02	17.83	21.63
K Chipsona-1	96.67	1.87	19.00	12.27	9.88	20.27
K Chipsona-3	98.00	1.56	26.00	14.27	11.89	28.37
K Frysona	98.00	2.88	23.33	9.45	8.54	22.10

**Table 198:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
MP/4-578	97.00	1.94	27.00	13.34	11.89	22.83
MP/6-39	98.00	1.84	31.67	9.23	7.80	27.27
Atlantic	91.00	1.77	12.33	16.48	16.30	19.27
K Chipsona-1	98.00	1.28	26.00	15.47	15.40	26.27
K Chipsona-3	91.00	2.74	32.00	19.91	17.83	24.33
K Frysona	98.00	1.94	27.00	15.93	17.84	24.80

**Table 199:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	90 days			110 days		
MP/4-578	14.5	0.0	12.0	18.0	0.0	12.5
MP/6-39	16.0	0.0	11.0	20.0	0.0	12.0
Atlantic	13.0	0.0	9.5	15.0	0.0	11.0
K Chipsona-1	18.2	0.0	10.0	21.5	0.0	11.5
K Chipsona-3	15.0	0.0	11.0	17.5	0.0	12.0
K Frysona	17.0	0.0	14.0	19.0	0.0	14.5

**KALYANI****Table 200:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
MP/4-578	12.50	1.97	56.00	2.84	2.38	19.20
MP/6-39	93.05	1.95	58.00	20.11	19.43	20.44

Atlantic	100.00	2.28	53.00	25.73	23.73	19.88
K Chipsona-1	96.66	1.42	59.00	23.81	22.21	18.92
K Chipsona-3	96.66	1.31	68.00	24.01	22.42	21.03
K Frysona	88.00	1.45	64.00	23.76	22.70	19.59

**Table 201:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
MP/4-578	13.20	3.00	90.00	4.66	3.16	21.44
MP/6-39	94.65	2.03	95.00	24.37	22.66	23.55
Atlantic	98.00	2.37	94.00	30.40	28.76	22.11
K Chipsona-1	94.33	3.11	97.00	28.60	26.93	21.91
K Chipsona-3	97.01	1.36	95.00	27.89	27.14	23.14
K Frysona	93.00	2.97	96.00	28.11	27.00	21.48

**Table 202:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	90 days			110 days		
MP/4-578	6.5	6.7	9.0	10.5	9.9	10.0
MP/6-39	DNA	7.8	10.3	5.0	7.3	9.8
Atlantic	10.0	8.3	9.2	12.5	8.2	11.0
K Chipsona-1	DNA	8.5	10.0	DNA	9.2	11.5
K Chipsona-3	DNA	7.7	9.7	8.5	9.2	10.8
K Frysona	7.0	8.3	8.3	11.7	8.8	9.4

DNA= Did not appear

## KANPUR

**Table 203:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and tuber rottage (t/ha) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)
MP/4-578	91.23	3.36	51.75	30.65	27.52	0.28
MP/6-39	89.31	3.05	46.38	38.71	35.52	0.38
Atlantic	92.69	2.74	63.00	27.94	24.85	0.27
K Chipsona-1	87.06	2.89	60.63	28.61	25.50	0.34
K Chipsona-3	85.19	2.96	64.05	23.52	22.63	0.39
K Frysona	86.06	2.65	66.50	27.58	24.56	0.29

**Table 204:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and tuber rottage (t/ha) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)
MP/4-578	91.00	3.29	65.00	31.72	29.12	0.29
MP/6-39	89.00	3.12	62.00	39.62	36.40	0.47
Atlantic	93.75	2.70	80.00	29.37	26.00	0.26
K Chipsona-1	88.50	2.86	75.60	29.43	25.79	0.37
K Chipsona-3	85.40	3.02	80.00	25.17	22.88	0.42
K Frysona	86.80	2.66	85.00	28.08	25.06	0.31

**Table 205:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	90 days			110 days		
MP/4-578	12	8	6	15	10	9
MP/6-39	13	10	7	14	11	8
Atlantic	14	12	10	15	13	12
K Chipsona-1	10	8	6	12	10	9
K Chipsona-3	9	6	5	12	8	6
K Frysona	11	9	5	14	10	8

**Table 206:** Total weight loss after 3 months storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
MP/4-578	< 6 week	0.0	45.0	1.1	55.0	75.0	77.1
MP/6-39	< 6 week	0.0	0.0	0.0	40.0	30.0	32.0
Atlantic	> 6 weeks	0.0	30.0	1.2	20.0	18.0	19.5
K Chipsona-1	< 6 week	0.0	0.0	0.0	40.0	35.0	37.0
K Chipsona-3	< 6 week	0.0	10.0	0.3	32.0	25.0	27.0
K Frysona	< 6 week	0.0	12.0	0.3	43.0	32.0	34.0

**KOTA****Table 207:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha), tuber rottage (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
MP/4-578	90.00	4.28	75.60	8.67	8.15	0.27	23.10
K Chipsona-1	92.33	4.78	73.70	8.03	7.45	0.37	21.10
K Chipsona-3	93.33	4.81	72.50	10.84	10.23	0.33	22.10
K Frysona	91.66	4.25	76.70	7.65	7.17	0.31	19.50

**Table 208:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha), tuber rottage (t/ha) and dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
MP/4-578	90.00	4.23	80.50	9.73	8.84	0.31	23.50
K Chipsona-1	92.13	4.67	82.50	9.17	8.26	0.41	21.40
K Chipsona-3	93.23	4.84	77.50	14.18	13.26	0.36	22.50
K Frysona	91.66	4.23	81.50	8.62	8.01	0.33	20.00

**Table 209:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	90 days			110 days		
MP/4-578	0	0.00	2.50	0	0.00	5.00
K Chipsona-1	0	4.00	5.00	0	5.00	6.00
K Chipsona-3	0	0.00	0.00	0	0.00	0.00
K Frysona	0	0.00	12.00	0	0.00	14.00

## MODIPURAM

**Table 210:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
MP/4-578	92.50	5.46	3.30	39.15	31.22	18.00
MP/6-39	95.83	5.92	3.00	40.03	28.86	18.00
Atlantic	96.25	4.68	3.50	30.30	26.43	19.10
K Chipsona-1	97.92	5.57	3.00	38.42	26.57	19.00
K Chipsona-3	99.17	4.81	2.50	38.41	30.78	18.20
K Frysona	94.17	4.71	2.50	34.47	23.44	18.80

**Table 211:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
MP/4-578	96.67	6.07	3.80	53.42	44.30	20.60
MP/6-39	97.08	5.87	3.60	54.86	44.14	20.30
Atlantic	93.75	4.98	4.00	39.38	36.11	20.90
K Chipsona-1	97.92	5.06	3.70	43.79	36.82	20.50
K Chipsona-3	97.92	4.68	3.50	46.06	38.04	19.00
K Frysona	92.92	5.14	3.50	46.17	37.04	21.60

**Table 212:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	90 days			110 days		
MP/4-578	Did not appear	Did not appear	Did not appear	Did not appear	Did not appear	Did not appear
MP/6-39						
Atlantic						
K Chipsona-1						
K Chipsona-3						
K Frysona						

**Table 213:** Total weight loss after 3 months storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage Weight basis	Total wt. Losses (%)
		At 6 weeks	End of storage ( 75days)			
MP/4-578	> 6 weeks	62.95	62.95	0.051	1.56	11.21
MP/6-39	> 6 weeks	0	0	0	3.6	10.8
Atlantic	> 6 weeks	9.65	15.28	0.03	7.07	14.32
K Chipsona-1	> 6 weeks	5.24	10.52	0.02	3.48	11.06
K Chipsona-3	> 6 weeks	70.27	74.9	0.33	3.5	15.21
K Frysona	> 6 weeks	27.81	41.85	0.04	1.01	15.7

## PANTNAGAR

**Table 214:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha), tuber rottage (t/ha), dry matter (%) and chip colour in 90 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable grade yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)	Chip colour
MP/4-578	96.00	3.90	95.33	31.20	30.65	0.06	17.33	3.33
MP/6-39	96.33	4.06	94.67	30.44	29.79	0.05	16.87	3.33
Atlantic	96.00	3.83	95.00	28.42	27.90	0.06	16.67	2.67
K Chipsona-1	96.67	3.97	94.00	26.71	26.13	0.07	15.77	3.00
K Chipsona-3	96.67	4.06	95.00	26.23	25.65	0.06	16.50	2.67
K Frysona	97.00	4.17	95.67	26.40	25.84	0.06	16.40	2.33

**Table 215:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha), tuber rottage (t/ha), dry matter (%) and chip colour in 110 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable grade yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)	Chip colour
MP/4-578	97.00	4.03	97.33	32.56	32.11	0.06	18.30	3.67
MP/6-39	97.00	4.03	67.00	31.45	30.89	0.04	18.33	3.67
Atlantic	97.00	3.98	96.33	29.30	28.76	0.04	17.33	2.67
K Chipsona-1	97.00	4.04	97.00	27.53	26.97	0.05	16.53	3.00
K Chipsona-3	96.33	4.04	98.00	27.61	27.07	0.04	16.50	2.67
K Frysona	96.00	4.04	97.33	27.39	26.88	0.06	16.53	3.00

**Table 216:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	90 days			110 days		
MP/4-578	5	0	0	5	0	0
MP/6-39	4	0	0	4	0	0
Atlantic	5	0	0	6	0	0
K Chipsona-1	5	0	0	4	0	0
K Chipsona-3	5	0	0	5	0	0
K Frysona	5	0	0	5	0	0

## PASIGHAT

**Table 217:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha), tuber rottage (t/ha) and dry matter (%)in 90 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable grade yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
MP/6-39	88.00	2.18	84.50	23.92	23.61	0.42	26.42
Atlantic	93.50	1.87	87.00	23.30	22.88	0.31	20.85
K Chipsona-1	84.00	2.29	90.00	25.58	25.06	0.42	29.46
K Chipsona-3	96.00	2.18	85.00	28.50	27.98	0.52	25.14
K Frysona	94.50	2.08	82.50	29.33	28.91	0.52	28.79

**Table 218:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha), tuber rottage (t/ha) and dry matter (%)in 110 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable grade yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
MP/6-39	89.00	1.87	96.00	25.17	24.75	0.73	27.39
Atlantic	91.00	2.39	98.00	27.87	27.35	0.42	21.72
K Chipsona-1	82.50	2.08	94.50	24.54	24.23	0.52	29.35
K Chipsona-3	95.50	1.98	96.00	30.78	29.74	0.31	24.86
K Frysona	93.00	2.29	97.00	31.82	31.10	1.04	29.23

**Table 219:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	90 days			110 days		
MP/6-39	4.4	3.9	4.1	4.8	4.1	4.5
Atlantic	2.8	3.0	2.9	3.1	3.7	3.5
K Chipsona-1	3.8	3.8	3.6	4.4	4.5	4.9
K Chipsona-3	1.5	0.0	0.0	2.0	0.0	0.0
K Frysona	2.1	1.4	2.3	2.5	1.8	2.8

**Table 220:** Total weight loss after 3 months storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 75 days)		Number basis	Weight basis	
MP/6-39	> 6 weeks	0.0	6.3	5.3	6.1	7.0	9.3
Atlantic	> 6 weeks	0.0	5.2	2.7	6.5	8.2	9.1
K Chipsona-1	> 6 weeks	0.0	5.8	3.2	6.9	8.5	7.7
K Chipsona-3	> 6 weeks	0.0	4.3	2.7	5.0	7.0	8.2
K Frysona	> 6 weeks	0.0	5.1	3.5	6.5	10.4	8.5

## PATNA

**Table 221:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and dry matter (%)in 110 days crop.

Hybrid/variety	Emergence (%)	Foliage Senescence (%)	Total yield (t/ha)	Marketable grade yield (t/ha)	Dry matter (%)
MP/4-578	83.00	81.33	11.59	11.42	22.33
MP/6-39	84.33	76.37	12.04	9.43	20.50
Atlantic	87.00	77.17	12.77	11.47	20.50
K Chipsona-1	88.33	73.87	16.32	11.54	20.57
K Chipsona-3	85.00	77.90	15.56	13.53	21.83
K Frysona	87.00	72.53	11.59	12.92	24.17

**Table 222:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
MP/4-578	Did not appear	2	3
MP/6-39		2	2
Atlantic		2	3
K Chipsona-1		1	3
K Chipsona-3		2	3
K Frysona		1	2



**Table 223:** Total weight loss after 3 months storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90 days)		Number basis	Weight basis	
MP/4-578	< 6 weeks	1.45	0.00	0.00	45.00	50.12	57.60
MP/6-39	< 6 weeks	2.43	0.00	0.00	46.89	48.46	54.94
Atlantic	> 6 weeks	0.00	0.00	0.00	49.34	50.92	58.51
K Chipsona-1	> 6 weeks	0.00	2.18	0.14	40.04	41.78	47.51
K Chipsona-3	< 6 weeks	2.24	1.07	0.07	46.64	49.91	56.57
K Frysona	< 6 weeks	0.74	0.00	0.00	46.99	47.89	54.49

**PUNE****Table 224:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and dry matter (%)in 90 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable grade yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
MP/4-578	93.00	3.17	73.00	12.35	11.45	0.89	19.54
MP/6-39	94.00	3.29	76.00	12.27	11.34	0.93	20.25
Atlantic	91.00	3.67	82.00	11.46	10.38	1.08	19.10
K Chipsona-1	90.00	4.00	87.00	11.20	10.05	1.15	18.25
K Chipsona-3	90.00	3.86	88.00	10.99	9.88	1.11	18.48

**Table 225:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
MP/4-578	6.67	26.67	5.33
MP/6-39	9.33	30.67	2.67
Atlantic	14.67	25.33	2.67
K Chipsona-1	12.00	20.00	4.00
K Chipsona-3	9.33	22.67	0.00

**Table 226:** Total weight loss after 3 months storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 75 days)		Number basis	Weight basis	
MP/4-578	> 6 weeks	0.0	0.0	0.0	1.8	1.1	9.6
MP/6-39	> 6 weeks	0.0	0.0	0.0	3.4	2.5	11.9
Atlantic	> 6 weeks	0.0	0.0	0.0	5.5	4.1	14.6
K Chipsona-1	> 6 weeks	0.0	0.0	0.0	7.4	6.4	15.9
K Chipsona-3	> 6 weeks	0.0	0.0	0.0	11.1	10.2	17.9

**RAIPUR****Table 227:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and dry matter (%)in 90 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable grade yield (t/ha)	Tuber rottage (t/ha)
MP/4-578	74.00	3.84	90.21	19.95	14.08	0.16
MP/6-39	83.17	3.84	80.21	21.27	15.73	0.30
Atlantic	76.33	3.93	97.45	20.34	15.02	0.13
K Chipsona-1	74.17	3.77	98.14	22.72	17.22	0.34
K Chipsona-3	87.17	3.89	96.84	28.52	20.94	0.36
K Frysona	97.83	3.77	90.33	23.33	18.53	0.41

**Table 228:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable grade yield (t/ha) and dry matter (%)in 110 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable grade yield (t/ha)	Tuber rottage (t/ha)
MP/4-578	74.00	3.84	100.00	21.70	16.32	1.27
MP/6-39	83.17	3.84	100.00	23.48	17.95	0.90
Atlantic	76.33	3.93	100.00	21.47	18.07	0.81
K Chipsona-1	74.17	3.77	100.00	24.65	18.59	0.41
K Chipsona-3	87.17	3.89	100.00	25.78	21.73	1.25
K Frysona	97.83	3.77	100.00	24.13	19.09	1.23

**Table 229:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	90 days			110 days		
MP/4-578	0.0	20.4	17.0	0	0	0
MP/6-39	0.0	22.4	27.0	0	0	0
Atlantic	0.0	24.4	21.0	0	0	0
K Chipsona-1	0.0	17.4	14.0	0	0	0
K Chipsona-3	0.0	11.4	19.0	0	0	0
K Frysona	0.0	19.4	23.0	0	0	0

**Table 230:** Total weight loss after 3 months storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 75 days)		Number basis	Weight basis	
MP/4-578	> 6 weeks	Nil	Nil	0	40	28.3	41.5
MP/6-39	> 6 weeks	Nil	Nil	0	40	38.9	40.3
Atlantic	> 6 weeks	Nil	Nil	0	30	29.5	32.2
K Chipsona-1	> 6 weeks	Nil	Nil	0	40	41.3	43.1
K Chipsona-3	> 6 weeks	Nil	Nil	0	20	19.6	22.1
K Frysona	> 6 weeks	Nil	Nil	0	50	49.4	51.4

### **POOLED OVER THE YEAR (2015-16 & 2016-17)**

**Table 230.1:** On-farm evaluation of processing hybrids under northern plains (HIS & MDP) at 90 days

Hybrid/variety	2015-16	2016-17	Mean B	2015-16	2016-17	Mean
	Total yield (t/ha)			Marketable yield (t/ha)		
MP/4-578	29.30	39.48	34.39	23.51	33.71	28.61
K Chip-1	31.01	36.34	33.67	23.38	28.42	25.90
K Frysona	26.66	34.39	30.53	21.43	26.82	24.12
Mean	28.99	36.74		22.77	29.65	
CD (5%)	Year = 2.96; Genotype = NS; Year x Genotype = NS			Year = 5.08; Genotype = NS; Year x Genotype = NS		

**Table 230.2:** On-farm evaluation of processing hybrids under northern plains (HIS & MDP) at 110 days

Hybrid/variety	2015-16	2016-17	Mean B	2015-16	2016-17	Mean
	Total yield (t/ha)			Marketable yield (t/ha)		
MP/4-578	34.79	49.99	42.39	28.75	43.78	36.26
K Chip-1	33.37	43.04	38.20	26.04	37.53	31.78
K Frysona	33.23	43.94	38.59	29.60	36.82	33.21
Mean	33.80	45.65		28.13	39.38	
CD (5%)	Year = 3.04; Genotype = NS; Year x Genotype = NS			Year = 4.79; Genotype = NS; Year x Genotype = NS		

**Table 230.3:** On-farm evaluation of processing hybrids under central plains (CHN, DES, KTT & RPR) at 90 days

Hybrid/variety	2015-16	2016-17	Mean B	2015-16	2016-17	Mean B	2015-16	2016-17	Mean B
	Total yield (t/ha)			Marketable yield (t/ha)			Dry matter (%)*		
MP/4-578	23.20	21.13	22.17	14.65	18.26	16.45	21.77	21.67	21.72
K Chip-1	24.87	22.08	23.48	13.83	17.63	15.73	20.21	19.69	19.95
K Frysona	26.19	21.30	23.74	15.28	17.42	16.35	20.56	20.80	20.68
Mean A	24.75	21.50		14.59	17.77		20.85	20.72	
CD	Year = NS; Genotype = NS; Year x Genotype = NS			Year = NS; Genotype = NS; Year x Genotype = NS			Year = NS; Genotype = NS; Year x Genotype = NS		

\*Dry matter (%) recorded at CHN, DES and KTT centers

**Table 230.4:** On-farm evaluation of processing hybrids under central plains (CHN, DES & RPR) at 110 days

Hybrid/variety	2015-16	2016-17	Mean B	2015-16	2016-17	Mean B	2015-16	2016-17	Mean B
	Total yield (t/ha)			Marketable yield (t/ha)			Dry matter (%)*		
MP/4-578	29.60	28.17	28.88	18.75	24.81	21.78	21.06	21.43	21.25
K Chip-1	30.39	28.81	29.60	16.94	23.79	20.37	20.76	19.82	20.29
K Frysona	31.91	27.84	29.87	18.81	22.27	20.54	21.38	22.57	21.97
Mean A	30.63	28.27		18.17	23.62		21.07	21.27	
CD	Year = NS; Genotype = NS; Year x Genotype = NS			Year = 5.13; Genotype = NS; Year x Genotype = NS			Year = NS; Genotype = NS; Year x Genotype = NS		

\*Dry matter (%) recorded at CHN and DES centers

**Table 230.5:** On-farm evaluation of processing hybrids under eastern plains (BHN, FZB and KAL) at 90 days

Hybrid/variety	2015-16	2016-17	Mean B	2015-16	2016-17	Mean B	2015-16	2016-17	Mean B
	Total yield (t/ha)			Marketable yield (t/ha)			Dry matter (%)*		
MP/4-578	16.32	19.77	18.05	14.44	17.74	16.09	21.47	20.07	20.77
K Chip-1	18.26	27.81	23.04	16.19	25.44	20.82	21.60	19.75	20.67
K Frysona	17.12	25.57	21.34	15.34	23.68	19.51	22.47	19.96	21.21
Mean A	17.24	24.38		15.32	22.29		21.84	19.92	
CD	Year = NS; Genotype = NS; Year x Genotype = NS			Year = 5.94; Genotype = NS; Year x Genotype = NS			Year = NS; Genotype = NS; Year x Genotype = NS		

**Table 230.6:** On-farm evaluation of processing hybrids under eastern plains (FZB, KAL & PAT) at 110 days

Hybrid/variety	2015-16	2016-17	Mean B	2015-16	2016-17	Mean B	2015-16	2016-17	Mean B
	Total yield (t/ha)			Marketable yield (t/ha)			Dry matter (%)*		
MP/4-578	24.39	18.41	21.40	22.19	16.42	19.31	20.44	21.59	21.02
K Chip-1	27.55	27.77	27.66	25.35	24.21	24.78	20.74	21.07	20.91
K Frysona	25.14	25.01	25.07	22.39	23.78	23.09	20.72	22.06	21.39
Mean A	25.69	23.73		23.31	21.47		20.63	21.57	
CD	Year = NS; Genotype = NS; Year x Genotype = NS			Year = 5.13; Genotype = NS; Year x Genotype = NS			Year = NS; Genotype = NS; Year x Genotype = NS		

## GENET. 9: TRIAL FOR HEAT TOLERANCE

Two heat tolerant hybrids, HT/07-1105 and HT/07-620 were evaluated with control varieties viz., Kufri Surya, Kufri Khyati, Kufri Pukhraj, Kufri Badshah, Kufri Lauvkar, Kufri Bahar and Kufri Jyoti for 60, 75 and 90 days crop durations at 13 centres for 75, 90 and 110 days crop duration during *rabi* season in the plains.

Plant emergence was normal at all the centres except for both the hybrids at Kalyani, Modipuram and HT/07-1105 at Kanpur. Plant emergence at Kalyani was very poor for both the hybrids (<30%) at 75 days crop duration. At most of the locations the diseases such as late blight did not appear except at Faizabad, Kalyani, Kanpur, Kota and Modipuram where the incidence was low to moderate. Low incidence of leaf spot and viral disease was also observed in tested locations.

Hybrid, HT/07-620 and HT/07-1105 significantly out-yielded best control varieties at Bhubneshwar during 75 and 90 days crop durations, respectively. Both the hybrids were better than control varieties at Hisar and Modipuram and significantly out-yielded best control except HT/07-1105 at Hisar. HT/07-1105 also performed better than best control variety at Chhindwara. The hybrid, HT/07-620 significantly out-yielded best control genotype at Kanpur. K. Khyati was the best genotype for tuber yield at Gwalior, Jalandhar and Raipur while at Deesa, K. Pukhraj performed better than all other genotypes. In dry matter content (%) the hybrid, HT/7-1105 and HT/07-620 recorded significantly higher dry matter at Kalyani (at 75 days crop duration) and Kanpur, respectively. In storage studies, both the hybrids recorded at par total weight loss after 75 days of storage at ambient temperature than control at the tested centres. However, total weight loss at Raipur was higher in both the hybrids in comparison to controls.

The data over locations was pooled. The data of hybrid HT/7-1105 alongwith Kufri Surya and Kufri Khyati (Kufri Badshah at Deesa, Kufri Jyoti at Kalyani, Kufri Bahar at Hisar, Kota and Modipuram in place of Kufri Khyati) was pooled over 7 locations viz., Bhubaneshwar, Chhindwara, Deesa, Hisar, Kalyani, Modipuram (75 days crop duration only), Kota (90 days crop duration only) and Raipur. Hybrid, HT/7-1105 significantly out-yielded the best control at both the crop durations for total and marketable tuber yield and for dry matter content (%) at 90 days crop duration.

**Table 231:** Experimental details

Experimental detail/Centre	BHN	CHN	DES	FZB	GWR	HIS	JAL
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD	RBD	RBD
Replication	4	4	4	4	3	4	3
Plot size (m <sup>2</sup> )	7.20	7.20	7.20	9.00	9.00	3.00	7.20
Spacing (cm)	60x20	60x20	60x20	60x20	60x20	60 X 20	60 X 20
Planting date	19.11.2016	07.11.16	22.10.16	19.11.16	23.10.16	17.10.16	15.10.16
Dehauling date							
60 DAP	-	22.01.17	-	-	-	-	-
75 DAP	26.01.17	06.02.17	08.01.17	03.02.17	08.01.17	02.01.17	29.12.16
90 DAP	10.02.17	06.02.17	21.01.17	18.02.17	23.01.17	17.01.17	13.01.17
Harvesting date							
60 DAP	-	27.02.17	-	-	-	-	-
75 DAP	31.01.17	27.02.17	03.02.17	15.02.17	21.01.17	15.02.17	20.01.17
90 DAP	15.02.17		03.02.17	23.02.17	05.02.17	15.02.17	07.02.17
Duration of crop (days)	75 & 90	75 & 90	75 & 90	75 & 90	75 & 90	150:50:100	75 & 90

Table contd.....

Experimental detail/Centre	KAL	KAN	KTT	MDP	PNT	RPR
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD	RBD
Replication	2	4	3	4	3	4
Plot size (m <sup>2</sup> )	7.20	7.20	9.00	7.20	9.00	7.20
Spacing (cm)	60x20	60x20	60x20	60x20	60x20	60x20
Planting date	22.11.16	28.10.16	15.11.16	26.09.16	22.10.16	13.11.16
Dehauling date						
60 DAP	-	-	-	-	-	-
75 DAP	06.02.17	13.01.17	-	10.12.16	07.01.17	28.01.17
90 DAP	21.02.17	28.01.17	15.02.17	-	22.01.17	12.02.17
Harvesting date						
60 DAP	-	-	-	-	-	-
75 DAP	16.02.17	20.02.17	-	19.12.16	17.01.17	03.02.17
90 DAP	03.03.17	21.02.17	05.03.17	-	02.02.17	19.02.17
Duration of crop (days)	75 & 90	75 & 90	90	75	75 & 90	75 & 90

## BHUBANESHWAR

**Table 232:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber & haulm dry matter (%) in 75 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Plant Vigor	foliage senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)	
								Tuber	Haulm
HT/7-1105	81.00	4.64	3.75	72.25	20.01	18.66	0.86	18.43	0.60
HT/7-620	92.25	7.97	4.00	67.00	34.00	32.84	0.62	16.70	0.86
K Surya	85.50	4.82	3.50	78.75	21.04	20.01	0.85	18.76	0.64
K Khyati	90.50	4.78	3.25	71.25	23.20	22.13	0.67	17.03	0.84
K Laukar	82.25	3.06	2.00	82.25	13.06	12.36	0.80	16.21	0.43
SEd	4.33	0.15	0.25	1.35	0.87	1.07	0.42	0.31	0.07
CD (0.05)	NS	0.33	0.55	2.98	1.91	2.35	NS	0.69	0.15
CV (%)	7.10	4.13	10.71	2.58	5.49	7.11	77.43	2.53	14.58

**Table 233:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber & haulm dry matter (%) in 90 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Plant Vigor	foliage senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)	
								Tuber	Haulm
HT/7-1105	95.50	4.62	3.75	97.25	24.93	23.97	0.38	18.38	0.61
HT/7-620	93.25	7.88	4.00	93.50	23.28	22.36	1.13	18.20	0.71
K Surya	80.50	4.41	3.50	98.25	21.10	20.24	1.13	20.18	0.49
K Khyati	83.50	4.81	3.25	94.25	19.16	18.34	1.60	16.30	0.71
K Laukar	90.75	3.12	2.00	100.00	14.89	14.30	0.43	17.18	0.58
SEd	5.62	0.17	0.28	1.27	1.34	0.77	0.36	0.45	0.02
CD (0.05)	NS	0.38	0.62	2.80	2.95	1.70	0.79	0.98	0.04
CV (%)	8.96	4.89	12.06	1.86	9.15	5.51	54.22	3.49	3.90

**Table 234:** Total weight loss after 75 days storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
HT/7-1105	> 6 weeks	More	9.0	50.0	0.0		13.0
HT/7-620	> 6 weeks	More	0.0	5.0	5.0		8.3
K Khyati	> 6 weeks	More	0.0	0.0	0.0		4.2
K Laukar	> 6 weeks	More	0.0	11.5	7.7		14.5

## CHHINDWARA

**Table 235:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Plant Vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
HT/7-1105	93.25	6.43	5.00	73.25	28.02	25.59	17.50
HT/7-620	93.05	6.18	4.65	76.00	26.04	23.70	17.43
K Surya	93.55	5.83	5.00	79.50	25.28	22.78	17.38
K Khyati	95.05	6.46	5.03	77.00	27.52	25.09	17.23
SEd	1.17	0.20	0.15	1.35	0.28	0.34	0.18
CD (0.05)	NS	0.47	NS	3.09	0.64	0.78	NS
CV (%)	1.76	4.62	4.40	2.49	1.47	1.98	1.49

**Table 236:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant Vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
HT/7-1105	94.00	6.43	5.08	85.50	31.95	29.48	18.53
HT/7-620	93.25	6.18	4.53	86.00	29.36	26.90	18.33
K Surya	94.10	5.94	5.03	86.00	29.05	26.55	18.43
K Khyati	94.50	6.46	5.03	88.25	30.25	27.85	18.50
SEd	1.24	0.20	0.13	1.61	0.28	0.21	0.15
CD (0.05)	NS	NS	0.30	NS	0.64	0.47	NS
CV (%)	1.86	4.42	3.70	2.63	1.32	1.05	1.12

**Table 237:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
HT/7-1105	0.0	2.0	2.1	0.0	3.2	2.0
HT/7-620	0.0	2.1	2.0	0.0	4.1	3.0
K Surya	0.0	2.9	2.2	0.0	4.0	2.2
K Khyati	0.0	3.6	2.4	0.0	5.1	2.5

#### DEESA

**Table 238:** Plant emergence (%), seed wt. (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant Vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
HT/7-1105	84.45	5.23	4.83	2.00	42.67	39.64	17.43
HT/7-620	85.00	5.28	5.00	1.50	43.88	42.82	17.40
K Surya	86.11	5.44	4.83	2.00	35.55	35.04	18.83
K Badshah	88.33	5.57	5.00	2.17	40.82	39.69	15.53
K Pukhraj	83.89	5.75	5.00	2.50	50.12	49.22	15.53
SEd	2.77	0.03	0.13	0.31	1.84	1.73	0.32
CD (0.05)	NS	0.07	NS	NS	4.31	4.04	0.75
CV (%)	3.96	0.64	3.21	18.51	5.29	5.12	2.32

**Table 239:** Plant emergence (%), seed wt. (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant Vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
HT/7-1105	85.00	5.30	5.00	3.83	51.27	49.76	18.93
HT/7-620	85.00	5.25	5.00	3.50	59.89	59.08	18.53
K Surya	87.22	5.46	4.83	4.33	44.37	43.83	20.13
K Badshah	84.28	5.57	4.83	4.50	50.23	48.93	17.60
K Pukhraj	85.00	5.74	4.83	5.00	61.07	60.08	17.40
SEd	3.02	0.04	0.18	0.16	2.31	2.46	0.49
CD (0.05)	NS	0.10	NS	0.37	5.40	5.75	1.16
CV (%)	4.34	0.99	4.56	4.57	5.30	5.75	3.27

**Table 240:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
HT/7-1105	Did not appear	8.11	5.32	Did not appear	11.13	7.48
HT/7-620		3.29	2.71		4.12	4.21
K Surya		7.71	4.71		8.71	5.89
K Badshah		8.41	4.89		9.41	5.94
K Pukhraj		9.44	6.61		12.44	7.21

**Table 241:** Total weight loss after 75 days storage at ambient temperature

Hybrid/cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
HT/7-1105	> 6 weeks	0	0	0	1.3	1.6	7.7
HT/7-620	> 6 weeks	0	0	0	0.0	0.0	6.3
K Surya	> 6 weeks	0	0	0	0.6	0.7	7.3
K Badshah	> 6 weeks	0	0	0	0.0	0.0	9.0
K Pukhraj	> 6 weeks	0	0	0	2.2	3.5	14.3

**FAIZABAD****Table 242:** Plant emergence (%), seed wt. (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha), dry matter (%) and haulm dry wt (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant Vigor	foliage senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)	
								Tuber	Haulm
HT/7-1105	91.32	3.40	4.00	17.50	25.99	24.00	0.82	17.28	8.99
HT/7-620	89.59	3.40	3.63	18.75	24.00	22.50	0.98	17.36	9.05
K Surya	90.98	3.50	3.63	16.25	24.45	23.19	0.92	17.47	9.08
K Khyati	92.36	3.39	4.00	17.50	27.01	25.02	0.90	17.46	9.08
SEd	1.77	0.06	0.13	2.04	1.05	1.06	0.03	0.09	0.05
CD (0.05)	NS	NS	0.30	NS	NS	NS	0.08	NS	NS
CV (%)	2.74	2.65	4.89	16.50	5.85	6.30	5.34	0.72	0.73

**Table 243:** Plant emergence (%), seed wt. (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha), dry matter (%) and haulm dry wt (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant Vigor	foliage senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)	
								Tuber	Haulm
HT/7-1105	91.32	3.40	4.00	81.25	35.00	32.98	0.87	18.26	9.49
HT/7-620	91.67	3.53	3.75	83.75	30.00	28.50	1.12	18.43	9.57
K Surya	92.02	3.50	3.75	78.75	30.98	29.50	1.04	18.14	9.43
K Khyati	91.67	3.44	4.00	77.50	34.00	31.98	0.97	18.56	9.63
SEd	0.87	0.07	0.14	2.06	1.38	1.33	0.03	0.05	0.03
CD (0.05)	NS	NS	NS	NS	3.18	3.06	0.07	0.12	0.07
CV (%)	1.34	2.95	5.27	3.63	6.03	6.14	4.30	0.41	0.44

**Table 244:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
HT/7-1105	0	10	10	25	12	12

HT/7-620	0	20	0	30	18	5
K Surya	0	10	20	25	12	15
K Khyati	0	18	15	35	20	12

**Table 245:** Total weight loss after 75 days storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
HT/7-1105	> 6 weeks	0	9.8	1.1	11.3	9.9	10.9
HT/7-620	> 6 weeks	0	14.2	1.3	15.4	13.8	13.7
K Surya	> 6 weeks	0	12.7	1.2	12.6	11.1	12.2
K Khyati	> 6 weeks	0	11.6	1.3	13.2	11.5	12.8

## GWALIOR

**Table 246:** Plant emergence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and dry matter (%) in 75 & 90 days crop.

Hybrid/ variety	Emergen ce (%)	Plant Vigor	Total yield (t/ha)	Mkt yield (t/ha)	Dry matter (%)	Emerge nce (%)	Plant Vigor	Total yield (t/ha)	Mkt yield (t/ha)	Dry matter (%)
HT/7-1105	89.34	4.75	24.25	21.08	17.25	89.34	4.75	30.71	26.96	19.22
HT/7-620	91.67	5.00	26.56	23.53	17.98	91.67	5.00	32.28	28.72	18.82
K Surya	86.67	4.25	21.66	17.35	16.93	86.67	4.25	29.89	25.78	18.87
K Khyati	94.00	4.50	34.02	29.99	15.52	94.00	4.50	37.83	34.60	17.06
K Laukar	87.00	3.50	17.27	15.42	17.78	87.00	3.50	29.79	27.85	19.15
SEd	1.76	0.36	2.28	2.41	1.09	1.76	0.36	1.07	0.79	0.78
CD (0.05)	3.88	0.79	5.02	5.31	NS	3.88	0.79	2.36	1.74	NS
CV (%)	2.78	11.55	13.01	15.89	9.03	2.78	11.55	4.72	3.87	5.94

## HISAR

**Table 247:** Plant emergence (%), seed wt.(t/ha) and total & processing grade tuber yield (t/ha) in 75 & 90 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Processing grade yield (t/ha)	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Processing grade yield (t/ha)
HT/7-1105	94.27	4.82	30.90	27.54	95.70	4.65	38.40	34.87
HT/7-620	96.67	4.97	35.65	33.66	94.27	4.33	44.07	41.62
K Surya	94.69	5.62	24.45	21.80	98.32	5.36	32.04	29.48
K Bahar	97.55	6.16	26.45	21.07	94.72	6.28	32.26	27.37
SEd	1.08	0.31	3.40	2.57	0.40	0.26	1.65	1.78
CD (0.05)	2.47	0.72	7.79	5.89	0.91	0.61	3.78	4.08
CV (%)	1.59	8.24	16.35	13.96	0.59	7.25	6.35	7.54

**Table 248:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
HT/7-1105	Did not appear		1.0	Did not appear		1.5
HT/7-620	Did not appear		0.5	Did not appear		0.75



K Surya		1.5		2.5
K Bahar		1.0		2.0

## JALANDHAR

**Table 249:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale) and total & marketable tuber yield (t/ha) in 75 & 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant Vigor	Total yield (t/ha)	Mkt yield (t/ha)	75 days		90 days		
						Emergence (%)	Seed Wt. (t/ha)	Plant Vigor	Total yield (t/ha)	Mkt yield (t/ha)
HT/7-1105	90.00	5.97	4.00	23.15	22.08	89.33	5.92	4.00	36.67	35.14
HT/7-620	93.33	5.65	3.99	26.99	25.56	93.33	5.56	3.99	42.55	40.93
K Khyati	92.67	5.97	2.99	31.85	30.37	91.33	5.79	2.99	48.34	46.62
SEd	1.37	0.12	0.00	1.00	1.05	0.47	0.18	0.00	1.26	1.64
CD (0.05)	NS	NS	0.01	2.86	3.00	1.34	NS	0.01	3.60	4.69
CV (%)	1.83	2.50	0.07	4.49	4.96	0.63	3.88	0.10	3.64	4.92

**Table 250:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	75 days		90 days	
				Late blight (%)	Leaf spot disease (%)	Viral disease (%)	
HT/7-1105	0	0	0	0	0	0	
HT/7-620	0	0	0	0	0	0	
K Khyati	0	0	5	0	0	5	

## KALYANI

**Table 251:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), tuber and halm dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant Vigor	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)	Haulm dry matter (%)
HT/7-1105	21.00	97.95	5.00	48.46	43.27	18.50	3.45
HT/7-620	27.50	93.98	5.00	45.71	40.03	16.20	3.00
K Surya	56.03	97.80	4.00	45.20	42.20	17.84	6.53
K Pukhraj	59.10	98.10	4.50	44.49	35.60	17.24	4.21
K Jyoti	61.28	97.89	4.00	37.80	34.03	16.59	5.06
SEd	30.78	0.76	0.32	1.78	2.52	0.22	0.17
CD (0.05)	NS	2.15	NS	5.07	NS	0.62	0.48
CV (%)	68.43	0.78	7.03	4.02	6.45	1.27	3.78

**Table 252:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), tuber and halm dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant Vigor	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)	Haulm dry matter (%)
HT/7-1105	67.50	98.14	5.00	49.76	46.44	19.66	2.23
HT/7-620	70.00	94.39	5.00	47.61	42.23	18.33	1.79
K Surya	98.53	98.53	4.00	47.12	43.20	18.28	4.64
K Pukhraj	98.79	98.79	4.50	45.49	40.81	20.80	2.65
K Jyoti	99.10	99.10	4.50	40.25	36.47	18.23	3.01
SEd	1.82	0.91	0.50	1.56	3.76	0.29	0.30
CD (0.05)	5.20	2.59	NS	4.45	NS	0.82	0.86
CV (%)	2.10	0.93	10.87	3.39	8.98	1.51	10.56

**Table 253:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
HT/7-1105	Did not appear	4	6.64	9.64	6.15	8.2
HT/7-620		5	7.25	8.3	7	9.5
K Surya		DNA	5	8.55	6.3	7.55
K Pukhraj		7.65	11.4	10.82	8.75	13.25
K Jyoti		8.5	10.35	11.6	9	11.28

DNA= Did not appear

**KANPUR****Table 254:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and tuber & halm dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant Vigor	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)	Haulm dry matter (%)
HT/7-1105	27.00	2.78	4.13	33.50	12.92	10.14	19.23	6.33
HT/7-620	80.50	3.20	4.50	30.75	27.50	24.00	20.18	7.33
K Surya	83.50	2.92	4.38	35.25	15.63	12.43	19.63	8.28
K Bahar	92.50	2.64	4.63	38.00	14.48	11.53	18.98	9.28
SEd	3.35	0.29	0.32	1.89	1.81	1.77	0.20	0.11
CD (0.05)	7.69	NS	NS	4.33	4.15	4.06	0.46	0.26
CV (%)	6.69	14.07	10.40	7.77	14.49	17.23	1.46	2.03

**Table 255:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber & halm dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant Vigor	Foliage Senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Tuber rottage (t/ha)	Tuber dry matter (%)	Haulm dry matter (%)
HT/7-1105	28.00	2.99	3.63	70.95	17.81	13.48	0.70	20.23	8.28
HT/7-620	79.50	3.65	3.75	66.50	29.24	24.27	0.64	21.33	9.35
K Surya	84.25	3.20	3.75	69.38	21.63	16.11	0.59	20.18	10.30
K Bahar	94.00	2.99	3.75	72.00	19.00	15.66	0.56	19.33	11.30
SEd	3.01	0.34	0.37	0.91	2.52	2.01	0.05	0.19	0.15
CD (0.05)	6.91	NS	NS	2.09	5.79	4.61	NS	0.43	0.35
CV (%)	5.96	15.03	14.22	1.85	16.29	16.36	11.47	1.32	2.20

**Table 256:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
HT/7-1105	10.5	8.0	6.0	12.0	10.0	8.0
HT/7-620	11.0	7.0	6.0	14.0	8.0	7.0
K Surya	10.0	8.0	5.0	12.0	10.0	7.0
K Bahar	12.0	10.0	8.0	14.0	12.0	10.0

## KOTA

**Table 257:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber dry matter (%) in 90 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Plant Vigor	foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
HT/7-1105	88.33	3.59	4.17	78.33	17.52	16.00	0.56	23.77
K Surya	90.11	3.33	4.00	86.67	15.48	14.11	0.74	23.13
K Bahar	92.33	4.44	4.33	83.33	15.37	14.41	1.11	20.33
SEd	1.84	0.29	0.17	2.72	1.07	0.83	0.23	0.28
CD (0.05)	NS	0.81	NS	NS	NS	NS	NS	0.81
CV (%)	2.50	9.21	4.90	4.03	8.11	6.83	35.06	1.55

**Table 258:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
HT/7-1105	0.00	7.50	0.00
K Surya	13.00	10.00	13.00
K Bahar	34.00	26.50	34.00

## MODIPURAM

**Table 259:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant Vigor	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
HT/7-1105	78.33	4.51	3.40	4.75	24.45	22.51	17.22
HT/7-620	77.50	4.41	3.43	4.78	18.07	16.56	16.88
K Surya	81.25	3.26	3.85	4.25	14.36	12.04	17.19
K Bahar	78.33	4.24	3.80	4.00	13.95	12.27	16.21
SEd	2.46	0.19	0.06	0.16	0.74	0.74	0.13
CD (0.05)	NS	0.43	0.13	0.36	1.71	1.70	0.29
CV (%)	4.41	6.49	2.27	4.92	5.94	6.60	1.06

## PANTNAGAR

**Table 260:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), tubers rottage (t/ha) and dry matter (%) in 75 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant Vigor	Total yield (t/ha)	Marketable yield (t/ha)	Tubers rottage (t/ha)	Dry matter (%)
HT/7-1105	97.00	4.63	76.67	4.00	29.55	27.55	0.52	17.40
HT/7-620	97.00	4.30	75.67	4.00	30.11	29.18	0.61	17.33
K Surya	97.67	4.33	77.67	4.99	32.40	28.52	0.48	16.63
K Khyati	97.00	4.52	77.67	5.00	32.07	30.07	0.48	16.87
SEd	0.82	0.26	0.67	0.01	1.08	0.96	0.15	0.33
CD (0.05)	NS	NS	NS	0.02	NS	NS	NS	NS
CV (%)	1.03	7.11	1.06	0.23	4.25	4.09	35.54	2.39

**Table 261:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), tubers rottage (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant Vigor	Total yield (t/ha)	Marketable yield (t/ha)	Tubers rottage (t/ha)	Dry matter (%)
HT/7-1105	97.00	4.41	96.67	3.67	31.85	30.07	0.64	18.33
HT/7-620	96.00	3.89	96.33	4.00	32.40	30.48	0.76	18.13
K Surya	97.00	3.85	96.33	5.00	35.59	31.81	0.56	17.63
K Khyati	97.00	4.18	97.00	5.00	35.55	31.62	0.70	17.80
SEd	0.85	0.21	0.87	0.24	0.72	1.38	0.11	0.29
CD (0.05)	NS	NS	NS	0.59	1.79	NS	NS	NS
CV (%)	1.08	6.13	1.11	6.56	2.59	5.45	20.37	1.99

**Table 262:** Disease reaction

Hybrid/variety	Late blight (%)	Viral disease (%)	Wilt (%)	Late blight (%)	Viral disease (%)	Wilt (%)
	75 days			90 days		
HT/7-1105	5	0	0	5	0	0
HT/7-620	5	0	0	5	0	0
K Surya	5	0	0	5	0	0
K Khyati	5	0	0	5	0	0

#### RAIPUR

**Table 263:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), tubers rottage (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant Vigor	Total yield (t/ha)	Marketable yield (t/ha)	Tubers rottage (t/ha)	Dry matter (%)
HT/7-1105	90.00	4.62	19.42	4.48	17.37	11.84	0.23	20.12
HT/7-620	88.75	4.94	30.58	4.85	21.19	14.86	0.19	19.01
K Surya	89.17	4.57	27.16	4.28	15.42	10.59	0.35	20.28
K Khyati	89.17	4.62	27.17	4.50	21.50	16.57	1.27	19.02
SEd	4.26	0.43	2.56	0.15	0.45	0.34	0.14	0.07
CD (0.05)	NS	NS	5.86	0.34	1.02	0.78	0.33	0.17
CV (%)	6.75	12.94	13.86	4.66	3.35	3.57	40.09	0.53

**Table 264:** Foliage senescence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), tubers rottage (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Foliage Senescence (%)	Plant Vigor	Total yield (t/ha)	Marketable yield (t/ha)	Tubers rottage (t/ha)	Dry matter (%)
HT/7-1105	88.17	4.59	19.15	14.71	0.77	21.19
HT/7-620	89.75	4.71	23.59	15.18	1.31	21.26
K Surya	93.42	4.48	17.09	11.95	1.05	21.55
K Khyati	87.67	4.63	26.89	20.08	1.14	20.11
SEd	2.28	0.19	1.46	1.58	0.38	0.06
CD (0.05)	NS	NS	3.34	3.62	NS	0.14
CV (%)	3.60	5.72	9.50	14.42	50.90	0.40

**Table 265:** Disease reaction

Hybrid/variety	Late blight (%)	Viral disease (%)	Wilt (%)	Late blight (%)	Viral disease (%)	Wilt (%)
	75 days			90 days		
HT/7-1105	0	7.25	5.34	0	7.00	6.75
HT/7-620	0	8.13	4.38	0	11.00	6.00
K Surya	0	10.00	8.23	0	18.00	12.50
K Khyati	0	9.50	5.26	0	13.00	8.23

**Table 266:** Total weight loss after 75 days Storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
HT/7-1105	> 6 weeks	Nil	Nil	0	40.00	41.44	43.11
HT/7-620	> 6 weeks	Nil	Nil	0	50.00	49.68	51.51
K Surya	> 6 weeks	Nil	Nil	0	20.00	19.01	20.99
K Khyati	> 6 weeks	Nil	Nil	0	30.00	31.26	32.42

**POOLED OVER THE YEAR (2015-16 & 2016-17)****Table 266.1:** Total yield (t/ha) performance under different location over the year at 75 days

Hybrid/variety	BHN	CHN	DES	HIS	KAL	MDP	RPR	Mean
HT/7-1105	17.25	26.70	43.29	30.09	34.48	29.69	16.95	28.35
K Surya	19.51	24.29	34.94	21.21	31.45	19.81	14.51	23.67
K Khyati	20.38	24.95	41.14	20.51	25.84	24.00	20.34	25.31
Mean	19.05	25.31	39.79	23.94	30.59	24.50	17.27	
CD (5%)	Location = 1.73; Genotype = 1.13; Location x Genotype = 2.99							

**Table 266.2:** Marketable yield (t/ha) performance under different location over the year at 75 days

Hybrid/variety	BHN	CHN	DES	HIS	KAL	MDP	RPR	Mean
HT/7-1105	15.83	24.82	41.16	26.34	30.17	26.74	13.91	25.57
K Surya	18.26	22.25	34.08	18.72	27.36	17.38	11.83	21.41
K Khyati	19.15	22.92	39.48	17.56	22.11	21.51	17.89	22.94
Mean	17.75	23.33	38.24	20.87	26.55	21.88	14.55	
CD (5%)	Location = 1.55; Genotype = 1.02; Location x Genotype = 2.69							

**Table 266.3:** Total yield (t/ha) performance under different location over the year at 90 days

Hybrid/variety	BHN	CHN	DES	HIS	KAL	MDP	RPR	Mean
HT/7-1105	19.58	30.31	50.08	40.23	37.07	17.63	22.61	31.07
K Surya	19.09	27.63	43.52	23.45	33.14	15.33	17.36	25.64
K Khyati	16.76	27.73	48.57	25.51	27.90	15.21	24.31	26.57
Mean	18.47	28.56	47.39	29.73	32.70	16.06	21.43	
CD (5%)	Location = 1.74; Genotype = 1.14; Location x Genotype = 3.02							

**Table 266.4:** Marketable yield (t/ha) performance under different location over the year at 90 days

Hybrid/variety	BHN	CHN	DES	HIS	KAL	MDP	RPR	Mean
HT/7-1105	18.72	28.95	48.33	36.21	33.44	15.92	19.21	28.68
K Surya	18.17	26.17	42.27	21.63	29.40	13.79	14.34	23.68
K Khyati	15.53	26.22	47.33	22.36	24.22	14.13	20.97	24.39
Mean	17.47	27.11	45.97	26.73	29.02	14.61	18.17	
CD (5%)	Location = 1.61; Genotype = 1.05; Location x Genotype = 2.79							

**Table 266.5:** Total yield (t/ha) performance under different location over the year at 75 days

Hybrid/variety	BHN	CHN	DES	HIS	KAL	MDP	RPR	Mean
HT/7-1105	18.90	18.52	18.42	19.49	20.04	23.72	21.56	20.09
K Surya	19.49	18.72	19.31	17.13	18.00	23.15	21.25	19.58
K Khyati	16.59	18.52	17.56	18.14	17.83	20.32	20.27	18.46
Mean	18.33	18.58	18.43	18.25	18.62	22.39	21.03	
CD (5%)	Location = 0.47; Genotype = 0.30; Location x Genotype = 0.81							

DES = K Badshah in place of K Khyati; KAL = K Jyoti in place of K Khyati; HIS & MDP = K Bahar in place of K Khyati

## GENET. 10: ON FARM TRIAL FOR HEAT TOLERANCE

On-farm trials (replicated) with one heat tolerant hybrid, CP4054 and controls viz., Kufri Surya, Kufri Khyati, Kufri Pukhraj, Kufri Jyoti, Kufri Badshah and Kufri Lauvkar were conducted at 11 AICRP (P) centres for 75, 90 and 110 days crop durations. Plant emergence was normal at all locations except at Modipuram for CP-4054 (73.89%).

CP-4054 was better than the control varieties at Bhubaneswar, Chhindwara, Deesa (at 110 days crop duration), Faizabad, Hisar, Kalyani, Kota, Modipuram and Raipur for both total and marketable yield. Kufri Khyati was the best control at Bhubaneswar, Faizabad, Gwalior and Pantnagar; Kufri Surya was the best control at Chhindwara, Deesa (110 days crop duration), Kalyani, Raipur and Modipuram; Kufri Pukhraj was the best control at Deesa (90 days crop duration); Kufri Bahar at Kota for both the yields while only for total tuber yield at Hisar.

CP-4054 observed marginally higher dry matter content (%) at Gwalior, Hisar, Kalyani, Pantnagar and Raipur while at other locations at par values to the best control variety were recorded.

In foliage senescence (%), hybrid CP-4054 recorded at par to the controls at most of the locations. However, at Bhubaneswar, Kalyani (90 days crop duration) and Kota considerably less foliage senescence was recorded in CP-4054 in comparison to control varieties. Storage studies were conducted at Faizabad and Raipur. The total weight loss in hybrid was at par to the best control at Faizabad while it was higher than the best control at Raipur.

The pooled analysis for the genotype CP-4054, along with controls, Kufri Surya and Kufri Jyoti for the years 2015-16 and 2016-17 at Chhindwara, Deesa, Hisar, Kalka and Raipur for 75 days crop duration revealed that CP-4054 had marginally higher total and marketable tuber yields as well as dry matter content but the differences among genotypes were non-significant. For 90 days crop duration at Bhubaneswar, Chhindwara, Deesa, Hissar, Kalyani, Kota, Modipuram and Raipur, CP-4054 recorded significantly higher total and marketable tuber yields than the best control genotype, Kufri Surya, while CP-4054 recorded at par dry matter content to the best control.

**Table 267:** Experimental details

Experimental detail/Centre	BHN	CHN	DES	FZB	GWR
Year	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD
Location	4	4L	2L	2L	1L
Plot size (m <sup>2</sup> )	7.20	96.00	24.00	48.00	21.60
Spacing (cm)	60x20	60x20	60x20	60x20	60x20
Planting date	20.11.16	07.11.16	22-24.10.16	20.11.16	23.10.16
Dehauling date	75 DAP	22.01.16	07-13.01.17	-	08.01.17
	90 DAP	12.02.17	21-27.02.17	19.02.17	23.01.17
	110 DAP	-	-	10.03.17	-
Harvesting date	75 DAP	27.02.17	02-10.02.17	-	20.01.17
	90 DAP	20.02.17	27.02.17	25.02.17	05.02.17
	110 DAP	-	-	15.03.17	-
Duration of crop (days)	90	75 & 90	75 & 90	90 & 110	75 & 90

Contd....

Experimental detail/Centre	HIS	KAL	KTT	MDP	PNT	RPR
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD	RBD
Location	1L	1L	1L	1L	1L	4L
Plot size (m <sup>2</sup> )	96.00	7.20	36.00	21.60	96.00	96.00
Spacing (cm)	60 X 20	60x20	60x20	60x20	60x20	60x20
Planting date	17.10.16	22.11.16	08.11.16	26.09.16	22.10.16	13.11.16
Dehauling date	75 DAP	02.01.17	10.02.17	27.01.17	10.12.16	-
	90 DAP	20.01.17	22.02.17	10.02.17	22.01.17	13.02.17
	110 DAP	-	-	-	12.02.17	04.03.17
Harvesting date	75 DAP	20.02.17	04.03.17	05.03.17	19.12.16	-
	90 DAP	20.02.17	04.03.17	05.03.17	02.02.17	20.02.17

110 DAP	-			-	22.02.17	21.03.17
Duration of crop (days)	75 & 90	75 & 90	75 & 90	75	90 & 110	90 & 110

## BHUBANESHWAR

**Table 268:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), plant vigour (1-5 scale), total & marketable tuber yield (t/ha) and weight (t/ha) of rotten tubers in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)
CP-4054	98.00	5.94	52.00	5.00	26.89	26.52	1.25
K Surya	86.00	4.39	95.00	4.00	22.47	21.74	1.60
K Khyati	93.00	3.53	97.00	4.00	24.20	23.25	1.18
K Pukhraj	92.00	4.43	95.00	3.00	23.95	23.09	1.57
K Jyoti	93.00	2.89	93.00	4.00	22.20	21.06	1.28
K Laukar	86.00	2.99	98.00	3.00	17.79	16.57	0.74
K Himalini	83.00	2.90	92.00	3.00	19.24	18.20	0.32

## CHHINDWARA

**Table 269:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), plant vigour (1-5 scale), total & marketable tuber yield (t/ha) and tuber dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
CP-4054	96.00	4.89	81.75	5.05	28.50	27.35	18.18
K Surya	93.25	4.63	81.50	5.00	25.99	24.46	18.53
K Khyati	92.00	4.52	84.25	4.65	24.52	21.76	17.35

**Table 270:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), plant vigour (1-5 scale), total & marketable tuber yield (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
CP-4054	96.50	4.94	91.50	5.00	32.76	31.45	19.28
K Surya	90.50	4.52	91.50	5.00	27.76	26.46	19.60
K Khyati	93.50	4.39	93.50	4.93	26.46	25.46	18.50

**Table 271:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	75 days			90 days		
CP-4054	0	2.1	1.9	0	3	2
K Surya	0	2.9	2.1	0	3.8	2.1
K Khyati	0	3.5	2.3	0	4	2.6

## DEESA

**Table 272:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), plant vigour (1-5 scale), total & marketable tuber yield (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
CP-4054	86.75	5.11	1.75	5.00	32.73	32.10	17.05



K Surya	87.00	5.53	2.00	4.75	30.36	29.80	17.05
K Badshah	85.25	5.64	2.00	4.75	28.56	27.78	16.00
K Pukhraj	92.00	5.73	2.25	4.50	34.37	33.75	14.80

**Table 273:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), plant vigor (1-5 scale), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 110 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
CP-4054	89.25	5.12	2.25	5.00	51.04	50.37	20.45
K Surya	86.00	5.53	3.75	4.50	41.73	41.28	20.00
K Badshah	91.25	5.66	3.00	4.50	37.76	36.93	18.40
K Pukhraj	92.50	5.72	4.25	4.25	40.65	39.53	17.10

**Table 274:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	90 days			110 days		
CP-4054	Did not appear	1.22	1.09	Did not appear	3.29	2.23
K Surya		3.78	2.54		5.21	3.31
K Badshah		1.94	1.25		3.88	2.71
K Pukhraj		4.21	3.23		6.02	4.71

#### FAIZABAD

**Table 275:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber & haulm dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Tuber dry matter (%)	
								Tuber	Halm
CP-4054	94.00	3.35	17.50	4.00	26.26	24.06	1.00	17.45	9.58
K Surya	91.88	3.40	15.00	3.50	23.71	21.72	1.03	17.65	9.71
K Khyati	92.13	3.38	20.00	4.00	25.71	23.51	0.93	17.10	9.48

**Table 276:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber & haulm dry matter (%) in 110 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Tuber dry matter (%)	
								Tuber	Haulm
CP-4054	92.38	3.38	67.50	4.00	28.06	26.36	1.06	18.40	9.90
K Surya	92.50	3.38	72.50	3.50	25.86	24.21	1.10	18.50	9.95
K Khyati	91.50	3.35	72.50	4.00	27.71	26.11	1.01	18.25	9.97

**Table 277:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	75 days			90 days		
CP-4054	0	15	20	40	8	25
K Surya	0	10	5	30	15	10
K Khyati	0	10	10	25	12	12

**Table 278:** Total weight loss after 75 days storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
CP-4054	> 6 weeks	0	10.0	1.1	11.2	10.0	11.1
K Surya	> 6 weeks	0	15.0	1.6	15.7	14.1	15.7
K Khyati	> 6 weeks	0	12.5	1.1	12.4	11.2	12.3

**GWALIOR****Table 279:** Plant emergence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and dry matter (%) in 75 & 90 days crop.

Hybrid/ variety	Emer- gence (%)	Plant Vigor	Total yield (t/ha)	Mkt yield (t/ha)	Dry matter (%)	75 days		90 days		
						Emer- gence (%)	Plant Vigor	Total yield (t/ha)	Mkt yield (t/ha)	Dry matter (%)
CP-4054	91.11	5.00	21.85	20.01	18.76	91.11	5.00	30.44	28.58	19.67
K Surya	88.89	4.67	21.91	17.37	16.92	88.89	4.67	29.52	24.92	18.45
K Khyati	95.00	5.00	33.59	29.61	15.69	95.00	5.00	38.46	34.70	17.43
K Laukar	88.33	4.00	18.09	15.89	17.97	88.33	4.00	29.09	26.83	19.37
SEd	1.51	0.24	1.20	1.22	0.58	1.51	0.24	1.92	1.97	0.96
CD (0.05)	3.76	0.59	2.99	3.05	1.45	3.76	0.59	4.79	4.91	NS
CV (%)	2.03	6.19	6.15	7.23	4.11	2.03	6.19	7.37	8.39	6.24

**HISAR****Table 280:** Plant emergence (%), seed wt. (t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and tuber dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
CP-4054	96.67	4.31	5.00	31.78	29.96	17.50
K Surya	94.69	3.19	4.00	24.41	21.76	16.00
K Bahar	97.55	3.85	4.00	26.41	21.04	16.80

**Table 281:** Plant emergence (%), seed wt. (t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
CP-4054	94.27	4.36	5.00	41.06	39.57	18.50
K Surya	98.32	3.35	4.00	31.98	29.43	16.60
K Bahar	94.72	3.81	4.00	32.20	27.32	18.10

**Table 282:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	75 days			90 days		
CP-4054	Did not appear	Did not appear	0	Did not appear	Did not appear	0
K Surya			0.5			2
K Bahar			0			0.5

## KALYANI

**Table 283:** Plant emergence (%), foliage senescence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and tuber & haulm dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)	
						Tuber	Haulm
CP-4054	98.89	21.50	5.00	47.86	44.14	18.72	5.12
K Surya	97.80	20.50	4.00	45.20	42.20	17.84	6.53
K Pukhraj	98.10	21.50	4.00	44.48	35.59	17.24	4.21
K Jyoti	97.89	23.50	4.00	37.80	34.03	16.59	5.06

**Table 284:** Plant emergence (%), foliage senescence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and tuber & haulm dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)	
						Tuber	Haulm
CP-4054	98.34	68.00	5.00	51.36	48.25	21.78	3.73
K Surya	98.53	98.53	4.00	47.12	43.20	18.28	4.64
K Pukhraj	98.79	97.50	4.50	45.49	40.81	20.80	2.65
K Jyoti	99.10	96.00	4.50	40.25	36.47	18.23	3.01

**Table 285:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral disease (%)	Late blight (%)	Leaf spot diseases (%)	Viral disease (%)
	75 days			90 days		
CP-4054	Did not appear	Did not appear	Did not appear	7.70	Did not appear	5.48
K Surya		5.00	8.55	6.30	7.55	
K Pukhraj		7.65	11.40	10.82	8.75	13.25
K Jyoti		8.50	10.35	11.60	9.00	11.28

## KOTA

**Table 286:** Plant emergence (%), seed wt (t/ha), foliage senescence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed wt (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Mkt yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
CP-4054	97.10	4.56	47.00	4.50	21.27	20.21	0.86	22.10
K Surya	95.50	3.34	88.00	3.50	9.70	8.95	0.89	21.90
K Bahar	96.60	5.00	86.00	3.00	10.34	9.42	1.11	19.50

**Table 287:** Plant emergence (%), seed wt (t/ha), foliage senescence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed wt (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Mkt yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
CP-4054	97.10	4.67	57.00	4.50	35.45	34.53	1.11	22.50
K Surya	94.50	3.34	90.00	3.50	10.29	9.48	1.22	22.40
K Bahar	95.60	4.87	88.00	3.00	13.34	12.34	1.39	20.00

**Table 288:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral disease (%)	Late blight (%)	Leaf spot diseases (%)	Viral disease (%)
	90 days			110 days		
CP-4054	Did not appear	0.00	0.00	Did not appear	1.50	8.00
K Surya		12.00	10.00		12.00	10.00
K Bahar		34.50	29.00		34.50	29.00

**MODIPURAM****Table 289:** Plant emergence (%), seed wt (t/ha), foliage senescence (%), plant vigor (1-5 scale), total and marketable tuber yield (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed wt (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
CP-4054	73.89	6.20	3.00	5.00	15.22	14.29	17.04
K Surya	81.67	4.63	3.80	4.00	14.35	12.04	17.16
K Bahar	80.00	5.46	3.60	3.50	13.93	12.28	16.22

**PANTNAGAR****Table 290:** Plant emergence (%), seed wt (t/ha), foliage senescence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed wt (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Mkt yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
CP-4054	97.33	3.73	76.00	4.00	28.68	28.09	0.06	18.07
K Surya	97.00	3.82	77.00	4.67	28.92	28.43	0.07	17.27
K Khyati	97.00	3.80	77.67	4.33	29.82	29.29	0.08	16.97

**Table 291:** Plant emergence (%), seed wt (t/ha), foliage senescence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber dry matter (%) in 110 days crop

Hybrid/variety	Emergence (%)	Seed wt (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Mkt yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
CP-4054	95.33	3.73	95.67	4.00	29.35	28.84	0.07	18.87
K Surya	97.67	3.77	95.67	5.00	29.41	28.91	0.06	17.83
K Khyati	97.33	3.83	96.00	4.67	30.28	29.81	0.06	17.90

**Table 292:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral disease (%)	Late blight (%)	Leaf spot diseases (%)	Viral disease (%)
	90 days			110 days		
CP-4054	5	Did not appear	Did not appear	5	Did not appear	Did not appear
K Surya	5			5		
K Khyati	5			5		

**RAIPUR****Table 293:** Plant emergence (%), seed wt (t/ha), foliage senescence (%), plant vigor (1-5 scale), total and marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed wt (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
CP-4054	80.32	3.85	37.55	4.86	7.29	5.75	0.09	20.92
K Surya	90.76	3.82	27.53	4.25	6.06	4.93	0.30	20.12
K Khyati	88.94	3.86	43.85	4.55	5.84	4.83	0.20	19.78

**Table 294:** Plant emergence (%), seed wt (t/ha), foliage senescence (%), plant vigor (1-5 scale), total and marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber dry matter (%) in 110 days crop

Hybrid/variety	Emergence (%)	Seed wt (t/ha)	Foliage Senescence (%)	Plant Vigor (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
CP-4054	80.32	3.85	89.85	4.73	7.91	6.46	0.51	21.86
K Surya	90.76	3.82	79.85	4.30	6.61	5.13	0.26	20.45
K Khyati	88.94	3.86	97.08	4.43	7.20	5.19	0.61	20.10

**Table 295:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral disease (%)	Late blight (%)	Leaf spot diseases (%)	Viral disease (%)
	90 days			110 days		
CP-4054	Did not appear	4.39	5.86	Did not appear	7.42	11.25
K Surya		7.82	9.17		9.17	14.21
K Khyati		5.47	8.12		8.45	12.35

**Table 296:** Total weight loss after 75 days storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
CP-4054	> 6 weeks	Nil	Nil	0	40.0	40.0	41.36
K Surya	> 6 weeks	Nil	Nil	0	50.0	51.2	52.23
K Khyati	> 6 weeks	Nil	Nil	0	30.0	29.5	30.91

#### POOLED OVER THE YEARS (2015-16 & 2016-17)

**Table 296.1:** Yield (t/ha) performance and dry matter (%) at different locations (CHN, DES, HIS, KAL & RPR) in 75 days

Hybrid/variety	2015-16	2016-17	Mean	2015-16	2016-17	Mean	2015-16	2016-17	Mean
	Total yield (t/ha)			Marketable yield (t/ha)			Dry matter (%)		
CP-4054	24.74	29.63	27.19	23.56	27.86	25.71	17.84	17.86	17.85
K Surya	24.77	26.40	25.59	23.61	24.63	24.12	17.53	17.36	17.44
K Jyoti	24.28	24.63	24.45	22.20	21.89	22.05	16.50	16.69	16.59
Mean B	24.60	26.89		23.13	24.79		17.29	17.30	
CD (5%)	Year =NS; Genotype=NS; Year x Genotype =NS			Year =NS; Genotype=NS; Year x Genotype =NS			Year =NS; Genotype=NS; Year x Genotype =NS		

**Table 296.2:** Yield (t/ha) performance and dry matter (%) at different locations (BHN, CHN, DES, HIS, KAL, KTT, MDP & RPR) in 90 days

Hybrid/variety	2015-16	2016-17	Mean	2015-16	2016-17	Mean	2015-16	2016-17	Mean
	Total yield (t/ha)			Marketable yield (t/ha)			Dry matter (%)		
CP-4054	31.64	31.77	31.70	30.29	30.50	30.39	19.66	20.20	19.93
K Surya	26.61	24.50	25.55	24.67	22.83	23.75	19.30	19.21	19.26
K Jyoti	26.80	23.39	25.09	24.59	21.39	22.99	18.28	18.51	18.39
Mean B	28.35	26.55		26.52	24.91		19.08	19.31	
CD (5%)	Year =NS; Genotype=5.09; Year x Genotype =NS			Year =NS; Genotype=4.97; Year x Genotype =NS			Year =NS; Genotype=0.87; Year x Genotype =NS		

## GENET. 11: ON FARM EVALUATION OF TPS POPULATION

One TPS population, PT/08-109 with control 92-PT-27 was evaluated at Patna for 75 and 90 days crop durations. Emergence (%), foliage maturity (%), plant vigor, tuber uniformity, total and marketable tuber yield and dry matter content (%) of TPS population, PT/08-109 was at par to the control, 92-PT-27 at both 75 and 90 days crop durations. Late blight disease did not appear in both population and control variety.

**Table 297:** Experimental details

Centre	PAT	
Year	2016-17	
Design	RBD	
Location	2	
Plot size gross ( m <sup>2</sup> )	9.00	
Spacing (cm)	50 X 10	
Planting date	08.12.16	
Dehauling	75 DAP	21.02.17
	90 DAP	08.03.17
Harvesting	75 DAP	28.02.17
	90 DAP	15.03.17
N:P:K dose (kg/ha)	200: 100: 120	
Duration of crop (days)	75 & 90	

**Table 298:** Seedling survival (%), seedling vigor (1-5 scale), foliage senescence (%), total tuber yield (t/ha), tuber uniformity (1-5 scale) and dry matter (%) for 75 days crop.

Hybrid/ variety	Seedling survival (%)	Seedling vigor (1-5 scale)	Foliage Senescence (%)	Total tuber yield (t/ha)	Tuber uniformity (1-5 scale)		Tuber dry matter (%)
					Shape	Colour	
PT/08-109	84.33	4.00	45.00	19.46	3.33	4.00	14.87
92-PT-27	84.00	3.33	42.67	16.18	4.00	4.00	15.83
SEd	1.67	0.33	0.88	0.89	0.34	0.01	0.24
CD (0.05)	NS	NS	NS	NS	NS	NS	NS
CV (%)	2.43	11.08	2.46	6.10	11.25	0.18	1.92

**Table 299:** Seedling survival (%), seedling vigor (1-5 scale), foliage senescence (%), total tuber yield (t/ha), tuber uniformity (1-5 scale) and dry matter (%) for 75 days crop.

Hybrid/ variety	Seedling survival (%)	Seedling vigor (1-5 scale)	Foliage Senescence (%)	Total tuber yield (t/ha)	Tuber uniformity (1-5 scale)		Tuber dry matter (%)
					Shape	Colour	
PT/08-109	86.33	4.00	52.00	21.92	4.00	3.67	16.70
92-PT-27	84.67	3.33	49.67	18.09	3.33	3.67	16.20
SEd	4.84	0.33	2.33	1.21	0.34	0.58	0.32
CD (0.05)	NS	NS	NS	NS	NS	NS	NS
CV (%)	6.94	11.08	5.62	7.40	11.25	19.29	2.39

### **GENET. 13: VARIETAL EVALUATION TRIAL TO IDENTIFY TOP THREE PROMISING VARIETIES OF THE REGION**

To identify the top three promising potato varieties of the region, 8 potato varieties viz. Kufri Jyoti, Kufri Bahar, Kufri Sadabahar, Kufri Gaurav, Kufri Garima, Kufri Pushkar, Kufri Khyati and Kufri Pukhraj in north zone; 10 varieties viz., Kufri Jyoti, Kufri Bahar, Kufri Badshah, Kufri Gaurav, Kufri Garima, Kufri Pushkar, Kufri Surya, Kufri Khyati, Kufri Pukhraj and Kufri Lauvkar in central zone; 14 varieties viz., Kufri Jyoti, Kufri Himalini, Kufri Shailja, Kufri Gaurav, Kufri Garima, Kufri Pushkar, Kufri Lalima, Kufri Khyati, Kufri Pukhraj, Kufri Ashoka, Kufri Bahar, Kufri Badshah, Kufri Surya and Kufri Lauvkar in eastern zone; 7 varieties viz., Kufri Jyoti, Kufri Surya, Kufri Bahar, Kufri Pushkar, Kufri Lauvkar, Kufri Pukhraj and Kufri Khyati in plateau region (Pune) were evaluated during winter crop season through front line demonstration in 48 trials at 18 AICRP centres viz., Bhubaneswar, Chhindwara, Deesa, Dholi, Faizabad, Gwalior, Hisar, Jalandhar, Jorhat, Kalyani, Kanpur, Kota, Modipuram, Patna, Pantnagar, Pasighat, Pune and Raipur at 60, 75 and 90 days crop durations. At Deesa and Kota the trial was conducted for 90 days crop duration only. As reported, plant emergence was normal at all locations

Foliage senescence (%) was observed at Bhubaneswar, Chhindwara, Dessa, Jorhat, Kanpur, Modipuram, Pantnagar, Patna and Pasighat during 60, 75 and 90 days crop durations, at Faizabad, Kalyani and Raipur during 75 and 90 days crop durations, at Pune 75 days, at Deesa and Kota during 90 days crop duration. Foliage senescence was > 75% in all varieties after 60 days crop stage at Pasighat. All varieties had > 75% senescence during 90 days crop duration at Bhubaneswar, Chhindwara, Faizabad, Kota, Pasighat and Raipur.

In North Indian plains (Hisar, Jalandhar, Modipuram and Pantnagar), among the eight varieties tested, the top yielding variety was Kufri Khyati at 60, 75 and 90 days crop duration. At 60 days top four high yielding varieties were Kufri Khyati, Kufri Pushkar, Kufri Bahar and Kufri Pukhraj, however at 75 days top four high yielding varieties were Kufri Khyati, Kufri Pushkar, Kufri Pukhraj and Kufri Garima. At 90 days crop duration four high yielding varieties were Kufri Khyati, Kufri Pushkar, Kufri Garima and Kufri Pukhraj.

In central plains (Chhindwara, Gwalior, Raipur, Dessa and Kota), among the ten varieties tested, top four high yielding varieties at 60 days were Kufri Pushkar, Kufri Pukhraj, Kufri Jyoti and Kufri Garima, however at 75 days top four high yielding varieties were Kufri Gaurav, Kufri Lauvkar, Kufri Khyati and Kufri Pushkar. At 90 days crop duration four high yielding varieties were Kufri Pukhraj, Kufri Khyati, Kufri Pushkar and Kufri Garima.

In eastern plains (Bhubaneswar, Dholi, Faizabad, Jorhat, Kalyani, Kanpur, Pasighat and Patna), among 14 varieties tested, top four high yielding varieties at 60 days were Kufri Pushkar, Kufri Khyati, Kufri Garima and Kufri Pukhraj, however at 75 days top four high yielding varieties were Kufri Pukhraj, Kufri Pushkar, Kufri Khyati and Kufri Garima. At 90 days crop duration four high yielding varieties were Kufri Pukhraj, Kufri Pushkar, Kufri Khyati and Kufri Garima.

In plateau region at Pune, the top three yielding varieties were Kufri Surya, Kufri Khyati and Kufri Pukhraj at 60, 75 and 90 days crop duration.

On overall basis, Kufri Khyati was top high yielding variety at Jalandhar, Pantnagar and Faizabad during 60, 75 and 90 days crop duration, whereas Kufri Pushkar was top high yielding variety at Hisar and Dholi during 60, 75 and 90 days crop duration.

At 60 days crop duration trial conducted over 16 locations, Kufri Pushkar was top yielding variety at 6 locations namely Hisar, Chhindwara, Dholi, Jorhat, Kanpur and Pasighat. Kufri Khyati (Jalandhar, Pantnagar, Faizabad, Kalyani and Pune), Kufri Bahar (Modipuram), Kufri Garima (Gwalior), Kufri Surya (Raipur), Kufri Ashoka (Bhubaneswar) and Kufri Pukhraj (Patna) were top yielding varieties.

At 75 days crop duration trials conducted at 16 locations, Kufri Khyati (Jalandhar, Modipuram, Pantnagar, Gwalior and Faizabad), Kufri Pushkar (Hisar, Chhindwara, Dholi and Pasighat), Kufri Pukhraj (Jorhat, Kalyani, Kanpur and Patna), Kufri Surya (Raipur and Patna) and Kufri Gaurav (Bhubaneswar) were top yielding varieties.

At 90 day crop duration trials conducted over 18 locations, Kufri Khyati (Jalandhar, Modipuram, Pantnagar, Faizabad, Patna and Pune), Kufri Pukhraj (Dessa, Jorhat, Kalyani and Kanpur), Kufri Pushkar (Hisar, Gwalior and

Dholi), Kufri Garima (Chindwara), Kufri Surya (Raipur), Kufri Jyoti (Kota), and Kufri Gaurav (Bhubaneswar), Kufri Lalima (Pasighat) were top yielding varieties.

Keeping quality investigation was done at Dessa, Faizabad Modipuram and Raipur. At Dessa, total weight loss ranged from 9% (Kufri Surya) to 25% (Kufri Khyati). Keeping quality results at Faizabad indicated total weight loss from 11% (Kufri Jyoti) to 18% total (Kufri Pukhraj). Keeping quality results at Modipuram indicated total weight loss from 9% (Kufri Pushkar) to 18% total (Kufri Garima). At Raipur, total weight loss ranged from 26% (Kufri Kufri Bahar, Kufri Garima and Kufri Pukhraj) to 40% total (Kufri Khyati).

Evaluation of seven varieties for two years (2015-16 and 2016-17) in the Northern plains (Hisar, Pantnagar and Modipuram) at 60, 75 and 90 days crop duration was pooled. Kufri Khyati significantly out-yielded other varieties and was the best variety in all the three crop durations for both the yields along with Kufri Pushkar and Kufri Pukhraj.

In the Central plains (Chhindwara, Gwalior, Kanpur, Raipur at 60 and 75 days crop duration, and Chhindwara, Gwalior, Kanpur, Raipur, Deesa, Kota at 90 days crop duration), six varieties were evaluated. Kufri Khyati, Kufri Pukhraj and Kufri Pushkar were found to be the best performing varieties for both total and marketable tuber yield at all the crop durations. They were the top yielders in the order as mentioned above at all crop durations.

In the Eastern plains (Bhubaneswar, Faizabad, Jorhat, Kalyani, Pasighat at 60 and 75 days crop duration, and Bhubaneswar, Faizabad, Jorhat, Kalyani, Pasighat, Patna and Dholi at 90 days crop duration) six varieties were evaluated. At 60 days crop duration, Kufri Khyati, Kufri Pushkar and Kufri Garima were the top yielders for both total and marketable tuber yields among all. At 75 days crop duration, Kufri Khyati, Kufri Pukhraj, Kufri Garima and Kufri Pushkar were the top yielders for both the yields and were significantly out-yielded the other two varieties i.e. Kufri Gaurav and Kufri Jyoti. At 90 days crop duration, Kufri Khyati significantly out-yielded all other varieties for total and marketable tuber yields while Kufri Pukhraj, Kufri Pushkar and Kufri Garima were statistically at par for both the yields and were significantly better than Kufri Gaurav and Kufri Jyoti.

**Table 300:** Experimental details

Experimental detail/Centre	BHN	CHN	DES	DHL	FZB	GWL	HIS	JAL	JRH
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD	RBD	RBD	RBD	RBD
Replication	4	4	4	4	3	3	9	3	6
Plot size (m <sup>2</sup> )	9.00	10.80	9.00	9.00	9.00	9.00	9.00	10.80	9.00
Spacing (cm)	60x20	60x20	50x20	60x20	60x20	60x20	60x20	60x20	60x20
Planting date	19.11.16	08.11.16	14.11.16	05.11.16	20.11.16	24.10.16	20.10.16	15.10.16	19.11.16
Dehauling 60 DAP	13.01.17	08.01.17	-	05.01.17	21.01.17	12.11.16	20.12.16	14.12.16	19.01.17
75 DAP	28.01.17	23.01.17	-	20.01.17	05.02.17	25.12.16	05.01.17	29.12.16	03.02.17
90 DAP	12.02.17	07.02.17	03.03.17	07.02.17	20.02.17	10.01.17	21.01.17	13.01.17	18.03.17
Harvesting 60 DAP	18.01.17	28.02.17	-	16.01.17	02.01.17	24.12.16	16.02.17	09.01.17	26.01.17
75 DAP	02.02.17	28.02.17	-	31.01.17	15.02.17	06.01.17	16.02.17	20.01.17	10.02.17
90 DAP	17.02.17	28.02.17	03.03.17	17.02.17	27.02.17	23.01.17	16.02.17	07.02.17	25.03.17
N:P:K dose (kg/ha)	150.:80: 100	150:100: 100	275:138: 275	150:90: 100	150:100: 120	180:80: 120	150:50: 100	240:100: 150	120:100 :100
Duration of crop (days)	60, 75 & 90	60, 75 & 90	90	60, 75 & 90	60, 75 & 90	60, 75 & 90	60, 75 & 90	60, 75 & 90	60, 75 & 90

Table contd.....

Experimental detail/Centre	KAL	KAN	KTT	MDP	PNT	PAS	PAT	PUN	RPR
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD	RBD	RBD	RBD	RBD
Replication	3	4	3	3	3	4	4	3	4
Plot size (m <sup>2</sup> )	6.00	9.00	9.00	7.20	9.00	9.00	5.40	9.00	6.72
Spacing (cm)	60x20	60x20	60x20	60x20	60x20	60x20	60x20	60x20	60x20
Planting date	02.12.16	31.10.16	15.11.16	31.10.16	22.10.16	22.10.16	21.11.16	07.11.16	14.11.16



Dehauling 60DAP	02.02.17	31.12.16	-	30.12.16	22.12.16	16.12.16	20.01.17	30.12.16	13.01.17
75 DAP	17.02.17	15.01.17	-	14.01.17	07.01.17	01.01.17	04.02.17	13.01.17	28.01.17
90 DAP	04.03.17	30.01.17	15.02.17	29.01.17	23.01.17	15.01.17	19.02.17	08.02.17	12.02.17
Harvesting 60 DAP	12.02.17	26.02.17	-	27.02.17	02.01.17	22.12.16	07.03.17	10.01.17	20.01.17
75 DAP	27.02.17	26.02.17	-	27.02.17	18.01.17	07.01.17	08.03.17	22.01.17	04.02.17
90 DAP	14.03.17	27.02.17	10.03.17	27.02.17	02.02.17	21.01.17	08.03.17	15.02.17	19.02.17
N:P:K dose (kg/ha)	200:150: 150	180:80: 100	187:125: 125	180:80: 100	160:100: 100	150:120: 100	-	150: 60: 120	150:100: 100
Duration of crop (days)	60, 75 & 90	60, 75 & 90	90	60, 75 & 90	60, 75 & 90	60, 75 & 90	60, 75 & 90	60,75 & 90	60, 75 & 90

## BHUBANESHWAR

**Table 301:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt (t/ha)	Plant vigor (1-5 Scale)	Foliage Senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	97.50	2.77	4.00	11.50	15.93	14.96	0.65	16.13
K Himalini	90.00	3.07	3.00	11.00	13.40	12.50	0.12	16.90
K Shailja	98.00	4.53	5.00	9.75	15.65	14.72	0.49	16.15
K Gaurav	87.50	4.70	3.75	7.50	19.26	18.31	0.64	14.40
K Garima	92.25	4.14	3.75	7.50	18.28	17.35	0.25	17.95
K Pushkar	96.00	3.81	3.25	9.50	19.31	19.11	1.24	14.98
K Lalima	95.75	4.12	4.75	8.50	17.44	16.57	0.64	18.93
K Khyati	92.75	4.42	4.00	7.50	17.52	16.53	0.55	15.57
K Pukhraj	89.75	4.45	3.25	10.25	18.90	17.32	2.02	14.28
K Ashoka	94.25	3.17	4.00	9.75	20.08	20.06	1.31	15.38
SEd	2.73	0.15	0.25	0.81	0.82	0.85	0.07	0.27
CD (0.05)	5.63	0.31	0.51	1.67	1.69	1.76	0.14	0.55
CV (%)	4.13	5.48	8.99	12.34	6.57	7.20	12.51	2.35

**Table 302:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt (t/ha)	Plant vigor (1-5 Scale)	Foliage Senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	95.50	2.77	4.00	75.25	17.29	16.59	0.46	15.38
K Himalini	90.75	2.74	3.00	77.00	14.05	13.37	0.38	17.10
K Shailja	96.00	4.14	4.75	78.50	16.79	15.91	5.43	15.13
K Gaurav	93.50	3.92	3.75	69.00	21.95	21.01	1.56	17.53
K Garima	96.25	4.19	3.75	71.25	19.04	18.06	1.15	15.53
K Pushkar	96.00	3.19	3.25	74.75	20.36	19.40	0.35	18.65
K Lalima	97.25	4.41	4.75	65.75	18.81	17.90	1.29	20.85
K Khyati	93.50	4.78	3.75	62.25	18.70	17.65	0.59	17.40
K Pukhraj	98.25	4.79	3.25	83.25	18.34	17.33	1.29	16.33
K Ashoka	89.00	3.17	4.00	79.00	21.30	20.20	1.74	15.95
SEd	2.57	0.16	0.29	2.37	0.63	0.71	0.14	0.33
CD (0.05)	5.29	0.32	0.59	4.89	1.30	1.47	0.29	0.67
CV (%)	3.84	5.82	10.52	4.55	4.76	5.68	13.89	2.71

**Table 303:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt (t/ha)	Plant vigor (1-5 Scale)	Foliage Senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	96.50	2.79	4.00	96.75	17.59	16.73	0.76	16.80

K Himalini	91.00	2.77	3.00	95.00	15.70	14.69	0.40	17.40
K Shailja	97.25	4.22	4.75	96.00	17.10	15.96	3.82	16.63
K Gaurav	96.50	4.10	3.75	96.50	23.11	21.95	1.01	17.50
K Garima	89.75	4.32	3.75	94.50	20.68	20.02	0.83	16.85
K Pushkar	96.25	3.35	3.25	98.00	20.53	19.34	1.18	18.45
K Lalima	96.00	4.52	4.75	97.00	18.65	17.51	1.39	20.28
K Khyati	93.75	4.84	4.25	97.50	17.97	17.18	0.81	17.95
K Pukhraj	92.00	4.89	3.50	96.25	17.97	16.84	1.15	16.88
K Ashoka	91.50	3.23	4.00	97.00	21.58	20.56	0.97	16.80
SEd	2.22	0.14	0.30	1.83	0.85	0.85	0.26	0.32
CD (0.05)	4.57	0.29	0.62	NS	1.75	1.76	0.53	0.66
CV (%)	3.33	5.01	10.92	2.68	6.27	6.68	29.29	2.58

## CHHINDWARA

**Table 304:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	91.50	4.70	4.43	58.00	17.50	12.78	17.15
K Bahar	91.50	4.86	4.10	56.50	16.39	11.42	14.48
K Badshah	92.25	3.94	4.65	56.50	19.45	16.39	14.35
K Gaurav	91.50	3.89	4.23	52.75	17.13	12.45	14.33
K Garima	93.25	3.29	4.33	54.50	17.78	12.24	14.50
K Pushkar	92.00	4.77	4.35	58.50	21.65	16.12	16.58
K Surya	92.00	4.33	5.05	57.25	18.98	13.34	17.60
K Khyati	94.50	5.21	4.63	55.75	20.28	14.93	17.28
K Pukhraj	92.50	4.70	4.43	55.50	19.70	14.47	16.43
K Lauvkar	92.25	4.79	4.23	57.25	18.88	15.28	16.30
SEd	1.11	0.13	0.12	1.53	0.21	1.18	0.18
CD (0.05)	NS	0.27	0.24	3.16	0.43	2.43	0.37
CV (%)	1.69	4.10	3.71	3.85	1.57	11.94	1.59

**Table 305:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	91.75	4.75	4.15	72.75	25.00	21.05	17.60
K Bahar	90.75	4.77	4.15	76.00	23.89	19.10	16.63
K Badshah	92.25	3.91	4.75	73.75	26.33	20.56	16.83
K Gaurav	93.75	3.89	4.18	76.75	24.45	20.65	15.63
K Garima	92.25	3.13	4.28	78.00	25.10	19.68	16.25
K Pushkar	94.50	4.82	4.53	75.75	28.42	23.99	17.28
K Surya	94.25	4.19	5.15	77.25	25.93	22.04	18.48
K Khyati	94.50	4.84	4.58	73.50	26.95	21.67	17.80
K Pukhraj	93.00	4.70	4.30	75.75	27.64	22.69	17.15
K Lauvkar	92.25	4.86	4.23	74.75	25.28	21.02	17.05
SEd	0.86	0.12	0.13	1.32	1.87	0.77	0.11
CD (0.05)	1.78	0.24	0.27	2.72	NS	1.58	0.22
CV (%)	1.31	3.78	4.23	2.48	10.22	5.10	0.90

**Table 306:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	90.00	4.70	4.35	88.00	27.04	23.25	18.28
K Bahar	91.50	4.70	4.35	87.50	25.47	21.95	18.43
K Badshah	93.50	3.77	4.65	86.00	28.59	25.00	18.43
K Gaurav	92.00	3.89	4.30	86.75	27.38	23.89	17.30
K Garima	93.75	2.90	4.35	87.25	32.21	21.36	17.28
K Pushkar	92.50	4.75	4.70	85.75	30.89	25.65	18.30
K Surya	92.75	4.19	5.08	86.50	28.21	24.17	19.18
K Khyati	94.50	4.98	4.75	88.50	31.16	26.67	18.58
K Pukhraj	93.25	4.82	4.40	84.00	30.15	25.37	17.75
K Lauvkar	93.25	4.82	4.48	85.50	26.11	23.15	17.78
SEd	1.03	0.12	0.09	1.44	1.27	1.10	0.14
CD (0.05)	2.13	0.24	0.18	NS	2.63	2.27	0.28
CV (%)	1.58	3.81	2.78	2.36	6.27	6.48	1.07

**Table 307:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral diseases (%)	Late blight (%)	Leaf spot disease (%)	Viral diseases (%)	Late blight (%)	Leaf spot disease (%)	Viral diseases (%)
	60 days			75 days			90 days		
K Jyoti	Did not appear	Did not appear	Did not appear	Did not appear	Did not appear	Did not appear		3.70	2.35
K Bahar							4.50	4.60	
K Badshah							3.00	3.00	
K Gaurav							3.10	2.50	
K Garima							3.40	2.00	
K Pushkar							3.00	1.00	
K Surya							3.20	3.40	
K Khyati							3.20	1.67	
K Pukhraj							4.20	2.10	
K Lauvkar							3.40	3.70	

#### DEESA

**Table 308:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	96.11	6.60	5.00	4.50	36.22	34.24	17.10
K Bahar	93.89	6.50	4.50	4.50	26.14	22.87	16.65
K Badshah	95.28	6.71	5.00	3.88	39.83	38.06	18.98
K Garima	95.56	6.51	4.55	4.13	34.22	31.93	21.85
K Pushkar	92.22	6.39	5.00	4.38	37.27	35.44	18.10
K Surya	95.00	6.62	5.00	4.13	39.09	37.72	20.55
K Khyati	95.00	6.79	5.00	4.63	45.32	43.96	17.60
K Pukhraj	93.89	6.80	5.00	4.63	52.24	50.65	17.95
K Lauvkar	85.00	6.51	4.00	4.75	27.27	25.88	17.90
SEd	2.67	0.02	0.10	0.24	1.97	2.02	0.42
CD (0.05)	5.54	0.05	0.20	0.49	4.08	4.19	0.87
CV (%)	4.03	0.48	2.86	7.58	7.42	8.00	3.20

**Table 309:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot disease (%)	Viral diseases (%)
K Jyoti	Did not appear	8.22	5.39
K Bahar		9.93	4.12
K Badshah		3.29	3.21
K Garima		7.19	6.29
K Pushkar		7.93	7.79
K Surya		5.83	6.1
K Khyati		5.72	3.92
K Pukhraj		6.46	7.78
K Lauvkar		10.59	12.26

**Table 310:** Total weight loss after 75 days Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
K Jyoti	> 6 weeks	0.0	0.0	0.0	12.7	12.5	19.9
K Bahar	> 6 weeks	0.0	32.5	0.2	5.5	1.8	11.7
K Badshah	> 6 weeks	0.0	0.0	0.0	5.2	4.2	13.1
K Garima	> 6 weeks	0.0	0.4	0.0	5.4	4.9	16.4
K Pushkar	> 6 weeks	0.0	0.0	0.0	4.7	4.6	12.3
K Surya	> 6 weeks	0.0	0.5	0.0	2.0	0.4	9.0
K Khyati	> 6 weeks	0.0	1.3	0.0	16.1	15.2	24.7
K Pukhraj	> 6 weeks	0.0	0.0	0.0	4.1	4.0	13.5
K Lauvkar	> 6 weeks	0.0	0.0	0.0	5.4	4.8	12.8

**DHOLI****Table 311:** Plant emergence (%), seed wt (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	97.40	3.00	5.25	8.47	7.69	0.05	16.25
K Himalini	95.38	4.28	5.50	7.09	6.47	0.02	16.15
K Shailja	98.00	1.70	5.75	5.56	5.00	0.02	15.75
K Gaurav	97.45	2.75	3.00	7.47	6.75	0.05	15.93
K Garima	97.75	2.95	2.25	8.83	8.25	0.01	15.75
K Pushkar	98.20	4.44	1.25	9.39	8.75	0.04	15.70
K Lalima	97.75	3.78	6.75	7.67	6.75	0.25	15.25
K Khyati	96.00	4.08	5.00	8.53	8.03	0.01	16.33
K Pukhraj	97.38	2.53	8.00	7.89	7.06	0.06	15.43
K Ashoka	98.00	3.28	5.25	8.95	8.33	0.03	15.65
SEd	1.08	0.26	0.92	0.50	0.49	0.08	0.13
CD (0.05)	NS	0.54	1.89	1.02	1.01	NS	0.27
CV (%)	1.58	11.26	27.05	8.79	9.51	209.09	1.16

**Table 312:** Plant emergence (%), seed wt (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	97.00	3.11	10.00	13.55	11.46	0.09	18.00
K Himalini	96.00	4.28	7.00	11.39	10.02	0.05	17.80

K Shailja	98.50	1.86	5.75	8.97	6.95	0.05	17.05
K Gaurav	97.48	3.06	7.75	11.61	9.97	0.08	17.03
K Garima	97.38	2.78	6.50	14.64	12.67	0.03	18.50
K Pushkar	96.88	4.30	7.25	15.29	12.85	0.06	17.68
K Lalima	95.85	3.31	10.50	12.47	10.02	0.08	18.30
K Khyati	98.35	3.64	7.75	13.53	11.61	0.08	18.35
K Pukhraj	97.40	2.86	15.00	12.97	11.25	0.06	17.45
K Ashoka	98.25	3.75	7.75	13.99	11.99	0.09	17.58
SEd	0.89	0.37	1.16	0.26	0.32	0.02	0.17
CD (0.05)	NS	0.76	2.40	0.53	0.66	NS	0.36
CV (%)	1.29	15.91	19.27	2.84	4.18	40.28	1.39

**Table 313:** Plant emergence (%), seed wt (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	97.25	3.34	22.75	19.39	16.96	0.10	19.89
K Himalini	95.85	4.58	13.50	15.53	13.12	0.12	19.95
K Shailja	97.08	2.25	14.00	12.97	11.42	0.06	19.38
K Gaurav	96.65	3.11	12.00	16.18	13.86	0.11	19.70
K Garima	97.25	2.64	12.75	20.82	18.48	0.08	19.28
K Pushkar	97.10	4.44	12.75	21.75	18.76	0.11	20.16
K Lalima	95.75	3.42	17.00	16.89	14.47	0.08	20.75
K Khyati	97.55	4.22	16.50	19.96	17.65	0.13	21.15
K Pukhraj	96.75	2.83	24.25	17.28	14.93	0.10	18.78
K Ashoka	98.00	4.17	13.00	20.12	16.81	0.15	19.51
SEd	1.03	0.32	1.59	0.42	0.39	0.03	0.15
CD (0.05)	NS	0.66	3.28	0.87	0.80	NS	0.32
CV (%)	1.51	12.87	14.21	3.31	3.51	41.56	1.09

**Table 314:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot disease (%)	Viral diseases (%)	Late blight (%)	Leaf spot disease (%)	Viral diseases (%)	Late blight (%)	Leaf spot disease (%)	Viral diseases (%)
	60 days			75 days			90 days		
K Jyoti	12.0	Did not appear	20.0	15.0	Did not appear	20.0	15.0	Did not appear	22.0
K Himalini	8.0		15.0	10.0		12.0	15.0		15.0
K Shailja	10.0		15.0	12.0		15.0	18.0		20.0
K Gaurav	5.0		10.0	5.0		8.0	10.0		10.0
K Garima	0.0		10.0	4.0		10.0	8.0		8.0
K Pushkar	0.0		8.0	5.0		10.0	12.0		8.0
K Lalima	8.0		5.0	8.0		8.0	15.0		12.0
K Khyati	5.0		8.0	8.0		10.0	14.0		15.0
K Pukhraj	20.0		25.0	25.0		30.0	30.0		30.0
K Ashoka	15.0		20.0	10.0		18.0	25.0		18.0

#### FAIZABAD

**Table 315:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor (1-5 Scale)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	89.33	3.52	4.00	18.89	15.37	14.10
K Himalini	88.89	3.44	3.83	17.72	14.55	14.00
K Shailja	89.78	3.44	3.87	19.11	15.76	14.47

K Gaurav	87.56	3.52	3.53	17.68	14.44	14.33
K Garima	87.11	3.41	4.00	20.09	16.48	14.40
K Pushkar	88.89	3.52	3.43	17.72	14.55	14.27
K Lalima	88.44	3.40	3.90	16.52	14.22	14.07
K Khyati	88.44	3.52	4.00	21.78	17.89	14.07
K Pukhraj	87.11	3.40	4.00	20.77	16.98	14.23
K Ashoka	87.56	3.44	3.93	17.85	14.74	14.03
SEd	0.88	0.08	0.11	1.08	0.96	0.10
CD (0.05)	NS	NS	0.23	2.30	2.03	0.22
CV (%)	1.22	2.75	3.39	7.06	7.58	0.89

**Table 316:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor (1-5 Scale)	Foliage senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	88.89	3.41	4.00	16.67	31.33	26.44	1.11	17.77
K Himalini	89.78	3.44	3.83	16.67	29.55	26.00	0.87	17.27
K Shailja	88.89	3.52	3.87	16.67	31.53	26.64	0.92	17.63
K Gaurav	88.44	3.44	3.53	18.33	29.27	25.83	0.81	17.30
K Garima	88.00	3.48	4.00	16.67	33.55	29.55	1.00	17.43
K Pushkar	87.56	3.44	3.43	15.67	29.55	26.00	1.00	17.43
K Lalima	88.00	3.37	3.90	18.33	28.89	23.85	0.94	17.53
K Khyati	88.44	3.48	4.00	18.33	36.44	32.11	0.92	17.62
K Pukhraj	87.56	3.48	4.00	15.00	34.88	30.72	1.00	17.48
K Ashoka	88.44	3.48	3.93	21.67	30.33	26.22	1.08	17.40
SEd	0.89	0.08	0.11	2.14	1.66	1.58	0.04	0.08
CD (0.05)	NS	NS	0.23	NS	3.51	3.35	0.09	0.18
CV (%)	1.23	2.80	3.39	15.05	6.43	7.09	5.48	0.58

**Table 317:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor (1-5 Scale)	Foliage senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	88.00	3.52	4.00	80.00	36.20	33.33	1.18	18.30
K Himalini	88.44	3.48	3.83	78.33	33.55	30.89	0.96	18.27
K Shailja	89.33	3.44	3.87	76.67	33.89	32.22	1.04	18.38
K Gaurav	87.11	3.48	3.53	76.67	33.55	30.89	0.94	18.27
K Garima	87.56	3.40	4.00	78.33	38.42	35.33	1.13	18.33
K Pushkar	88.44	3.48	3.43	76.67	38.11	31.33	1.04	18.13
K Lalima	88.44	3.44	3.90	81.67	31.33	29.14	1.04	18.40
K Khyati	89.33	3.48	4.00	81.67	41.88	38.54	0.98	18.33
K Pukhraj	87.11	3.48	4.00	78.33	39.92	36.83	1.08	18.47
K Ashoka	88.00	3.52	3.93	85.00	31.18	30.03	1.13	18.52
SEd	0.87	0.06	0.11	2.37	2.17	1.75	0.05	0.09
CD (0.05)	NS	NS	0.23	5.02	4.60	3.71	0.11	0.20
CV (%)	1.21	2.02	3.39	3.66	7.43	6.53	6.25	0.62

**Table 318:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot disease (%)	Viral diseases (%)	Late blight (%)	Leaf spot disease (%)	Viral diseases (%)	Late blight (%)	Leaf spot disease (%)	Viral diseases (%)
	60 days			75 days			90 days		
K Jyoti	0	0	5	0	18	20	35	5	25
K Himalini	0	0	0	0	10	5	30	15	10

K Shailja	0	0	2	0	10	10	25	10	15
K Gaurav	0	0	5	0	20	15	30	15	15
K Garima	0	0	0	0	10	5	25	10	5
K Pushkar	0	0	0	0	18	15	35	20	12
K Lalima	0	0	0	0	20	10	40	25	15
K Khyati	0	0	0	0	0	5	25	5	10
K Pukhraj	0	0	0	0	10	14	20	8	15
K Ashoka	0	0	5	0	20	15	45	10	20

**Table 319:** Total weight loss after 75 days storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rotting		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
K Jyoti	> 6 weeks	0.0	9.8	1.1	11.3	10.0	11.3
K Himalini	> 6 weeks	0.0	14.5	1.3	15.2	13.7	14.8
K Shailja	> 6 weeks	0.0	12.7	1.1	12.6	11.6	12.2
K Gaurav	> 6 weeks	0.0	11.6	1.2	13.2	12.1	12.7
K Garima	> 6 weeks	0.0	20.2	2.1	14.6	13.9	14.5
K Pushkar	> 6 weeks	0.0	15.0	1.2	11.5	10.5	11.4
K Lalima	> 6 weeks	0.0	15.0	1.2	12.2	11.3	12.3
K Khyati	> 6 weeks	0.0	15.0	1.3	14.5	13.0	13.5
K Pukhraj	> 6 weeks	0.0	28.0	2.2	15.4	14.4	17.8
K Ashoka	> 6 weeks	0.0	25.0	2.5	16.2	11.6	14.8

## GWALIOR

**Table 320:** Plant emergence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and dry matter (%) in 60 & 75 days crop.

Hybrid/ variety	Emerg ence (%)	Plant vigor (1-5 Scale)	Total yield (t/ha)	Mkt yield (t/ha)	Dry matter (%)	Emerg ence (%)	Plant vigor (1-5 Scale)	Total yield (t/ha)	Mkt yield (t/ha)	Dry matter (%)
K Jyoti	87.56	5.00	18.39	16.52	16.26	87.56	5.00	25.67	24.02	16.98
K Bahar	89.78	4.00	22.43	21.02	15.81	89.78	4.00	29.21	26.96	17.33
K Badshah	81.78	5.00	18.24	16.93	14.76	81.78	5.00	21.98	19.26	16.06
K Gaurav	89.33	4.67	15.78	12.00	15.97	89.33	4.67	30.83	25.59	16.22
K Garima	91.56	5.00	22.94	21.83	15.73	91.56	5.00	34.93	32.94	16.29
K Pushkar	94.67	5.00	24.04	21.00	15.53	94.67	5.00	34.15	30.63	15.76
K Surya	85.33	4.67	16.28	13.20	16.25	85.33	4.67	22.18	17.57	16.58
K Khyati	92.89	5.00	23.93	21.04	14.19	92.89	5.00	36.65	32.57	14.81
K Pukhraj	94.22	5.00	23.72	20.83	15.49	94.22	5.00	34.65	31.29	16.49
K Lauvkar	84.89	4.33	16.04	15.09	16.94	84.89	4.33	27.15	25.48	17.67
S <sub>Ed</sub>	4.17	0.51	2.29	2.46	NS	4.17	0.51	5.78	5.30	NS
CD (0.05)	1.97	0.24	1.08	1.16	0.92	1.97	0.24	2.73	2.50	1.05
CV (%)	2.70	6.12	6.57	7.94	7.16	2.70	6.12	11.25	11.51	7.86

**Table 321:** Plant emergence (%), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/ variety	Emergence (%)	Plant vigor (1-5 Scale)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	87.56	5.00	28.24	25.82	18.58
K Bahar	89.78	4.00	32.58	29.69	18.21
K Badshah	81.78	5.00	28.15	25.63	16.37

K Gaurav	89.33	4.67	33.30	30.15	16.65
K Garima	91.56	5.00	36.87	33.81	17.96
K Pushkar	94.67	5.00	41.55	38.15	18.39
K Surya	85.33	4.67	29.39	25.48	18.66
K Khyati	92.89	5.00	37.91	34.79	16.91
K Pukhraj	94.22	5.00	40.52	38.72	17.36
K Lauvkar	84.89	4.33	29.56	27.78	19.19
SEd	4.17	0.51	3.83	4.08	NS
CD (0.05)	1.97	0.24	1.81	1.93	1.49
CV (%)	2.70	6.12	6.55	7.62	10.22

## HISAR

**Table 322:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	96.61	4.92	3.00	16.15	12.84	14.90
K Bahar	96.02	4.74	4.00	20.75	15.94	15.30
K Sadabahar	96.10	4.35	4.33	15.51	10.38	16.70
K Gaurav	94.47	3.73	4.00	20.03	11.38	15.53
K Garima	96.19	4.20	4.67	22.50	14.86	15.80
K Pushkar	94.01	3.73	5.00	29.19	17.63	12.40
K Khyati	96.93	5.39	3.00	19.53	14.67	16.07
K Pukhraj	96.19	4.24	4.00	21.09	15.48	16.77
SEd	1.04	0.19	0.16	1.57	1.38	0.37
CD (0.05)	NS	0.40	0.34	3.29	2.89	0.77
CV (%)	1.53	6.16	5.68	10.79	13.78	3.39

**Table 323:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	96.61	4.92	3.00	28.68	24.04	15.16
K Bahar	96.02	4.74	4.67	29.85	25.89	17.44
K Sadabahar	96.10	4.35	3.67	19.90	17.11	17.41
K Gaurav	95.27	3.67	3.67	30.52	25.44	16.63
K Garima	96.54	4.20	3.33	31.80	27.40	16.50
K Pushkar	93.83	3.73	4.00	33.71	26.39	12.94
K Khyati	96.14	5.39	4.67	26.21	20.78	16.31
K Pukhraj	95.97	4.24	4.33	30.47	24.75	15.89
SEd	1.05	0.21	0.38	1.79	1.29	0.71
CD (0.05)	NS	0.43	0.79	3.74	2.70	1.49
CV (%)	1.55	6.65	13.55	8.75	7.62	6.28

**Table 324:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	96.61	4.92	3.00	29.74	27.19	15.48
K Bahar	96.02	4.74	4.00	33.88	30.79	17.71
K Sadabahar	96.10	4.35	4.33	21.71	19.44	18.77
K Gaurav	95.67	4.16	4.33	35.62	30.01	18.03
K Garima	96.19	4.20	4.67	36.92	30.91	18.71
K Pushkar	94.01	3.73	5.00	41.60	35.67	13.31
K Khyati	96.93	5.39	3.00	34.09	29.49	16.73
K Pukhraj	96.19	4.24	4.00	32.36	28.88	16.59



SEd	1.03	0.21	0.18	1.16	1.25	0.85
CD (0.05)	NS	0.43	0.39	2.42	2.61	1.79
CV (%)	1.52	6.55	6.43	4.92	6.08	7.13

**Table 325:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
K Jyoti	0.0	0.0	1.0	0.0	0.0	1.5	0.0	0.0	2.0
K Bahar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
K Sadabahar	0.0	0.0	0.5	0.0	0.0	1.5	0.0	0.0	2.0
K Gaurav	0.0	0.0	2.0	0.0	0.0	2.5	0.0	0.0	3.0
K Garima	0.0	0.0	0.5	0.0	0.0	1.5	0.0	0.0	2.5
K Pushkar	0.0	0.0	0.5	0.0	0.0	1.5	0.0	0.0	2.0
K Khyati	0.0	0.0	1.5	0.0	0.0	2.5	0.0	0.0	4.0
K Pukhraj	0.0	0.0	0.8	0.0	0.0	1.5	0.0	0.0	2.0

## JALANDHAR

**Table 326:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale) and total & marketable tuber yield (t/ha) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor	Total yield (t/ha)	Marketable yield (t/ha)
K Jyoti	95.00	5.83	3.00	18.33	17.59
K Bahar	96.00	5.56	4.00	19.91	19.26
K Sadabahar	92.00	5.93	4.00	20.19	19.54
K Gaurav	92.00	5.37	4.00	20.28	19.45
K Garima	93.00	5.28	4.00	18.15	17.50
K Pushkar	97.00	4.91	4.00	23.15	20.84
K Khyati	96.00	5.83	3.00	24.26	22.22
K Pukhraj	94.00	5.83	4.00	22.78	21.85

**Table 327:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale) and total & marketable tuber yield (t/ha) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor	Total yield (t/ha)	Marketable yield (t/ha)
K Jyoti	97.00	5.56	3.00	35.19	33.61
K Bahar	97.00	5.56	4.00	30.93	29.54
K Sadabahar	93.00	5.83	4.00	30.37	29.26
K Gaurav	95.00	5.28	4.00	37.87	37.04
K Garima	96.00	5.37	4.00	36.67	35.65
K Pushkar	93.00	4.82	4.00	38.61	36.95
K Khyati	94.00	5.93	3.00	41.67	40.84
K Pukhraj	94.00	5.93	4.00	38.71	37.23

**Table 328:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale) and total & marketable tuber yield (t/ha) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor	Total yield (t/ha)	Marketable yield (t/ha)
K Jyoti	96.00	5.74	4.00	41.48	40.28
K Bahar	95.00	5.65	4.00	38.61	37.60
K Sadabahar	91.00	5.93	4.00	42.23	41.39
K Gaurav	92.00	5.28	4.00	46.95	44.73
K Garima	95.00	5.28	4.00	45.00	44.17

K Pushkar	95.00	5.00	3.00	47.87	45.84
K Khyati	92.00	6.02	4.00	48.62	46.02
K Pukhraj	3.00	5.93	4.00	46.95	44.17

**Table 329:** Disease reaction

Hybrid/ variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
K Jyoti	Did not appear	10	Did not appear	10	Did not appear	10			
K Bahar		25		25					
K Sadabahar		25		25					
K Gaurav		20		20					
K Garima		5		5					
K Pushkar		25		25					
K Khyati		5		5					
K Pukhraj		25		25					

### JORHAT

**Table 330:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor (1-5 Scale)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	98.67	2.29	3.33	26.00	19.15	12.95	17.10
K Himalini	97.00	2.94	3.67	26.00	19.27	15.62	17.27
K Shailja	98.33	1.01	3.33	28.33	21.43	15.83	19.00
K Gaurav	98.67	1.44	3.33	38.00	21.40	15.49	25.20
K Garima	97.00	1.11	3.33	26.33	20.26	14.63	18.67
K Pushkar	98.67	1.79	3.33	43.67	23.79	18.04	19.03
K Lalima	99.33	1.30	3.67	57.00	20.08	14.27	15.90
K Khyati	97.00	1.82	3.33	27.00	23.17	18.90	18.00
K Pukhraj	98.00	2.59	3.00	20.00	20.71	15.60	18.17
K Ashoka	98.00	1.27	3.67	19.00	19.58	14.17	17.97
SEd	0.85	0.21	0.46	1.08	0.57	0.47	0.50
CD (0.05)	NS	0.44	NS	2.29	1.20	1.00	1.06
CV (%)	1.06	14.43	16.70	4.25	3.32	3.72	3.28

**Table 331:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor (1-5 Scale)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	97.00	2.19	3.33	22.33	20.95	14.34	18.30
K Himalini	98.00	3.00	3.67	32.00	23.67	16.92	17.27
K Shailja	98.67	0.94	3.33	27.00	25.75	19.14	19.67
K Gaurav	97.33	1.21	3.33	34.00	24.97	17.08	23.60
K Garima	98.67	1.28	3.33	31.67	24.43	17.28	17.53
K Pushkar	100.00	1.93	3.33	27.00	25.44	19.69	19.27
K Lalima	98.67	1.30	3.67	46.00	24.87	18.85	19.30
K Khyati	98.33	2.57	3.33	12.33	25.10	19.32	14.93
K Pukhraj	98.67	2.93	3.00	34.00	25.61	15.52	19.77
K Ashoka	97.33	1.53	3.67	26.00	19.27	12.84	18.97
SEd	1.08	0.40	0.46	0.83	0.52	0.41	0.29
CD (0.05)	NS	0.85	NS	1.76	1.11	0.87	0.61
CV (%)	1.35	25.97	16.70	3.49	2.67	2.93	1.87

**Table 332:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor (1-5 Scale)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	97.00	2.25	3.33	23.00	22.18	14.06	18.13
K Himalini	96.00	3.17	3.67	37.00	24.09	14.89	17.63
K Shailja	98.67	0.88	3.33	34.00	22.58	14.74	18.83
K Gaurav	99.33	1.21	3.33	27.00	20.65	12.73	24.93
K Garima	98.67	1.27	3.33	19.00	24.01	16.07	18.57
K Pushkar	100.00	2.21	3.33	20.00	23.22	14.69	21.20
K Lalima	99.33	1.30	3.67	35.00	24.40	16.41	20.47
K Khyati	94.00	2.29	3.33	27.00	23.62	15.94	16.97
K Pukhraj	100.00	3.58	3.00	40.00	25.99	18.44	21.70
K Ashoka	97.33	1.65	3.67	17.33	22.91	15.00	21.43
SEd	1.46	0.29	0.46	0.66	0.52	0.35	0.72
CD (0.05)	3.08	0.62	NS	1.40	1.09	0.73	1.53
CV (%)	1.82	18.03	16.70	2.90	2.70	2.77	4.43

**Table 333:** Disease reaction

Hybrids/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
	K Jyoti	3.0	0.0	5.0	7.0	0.0	7.0	8.0	0.0
K Himalini	1.0	0.0	6.0	2.5	0.0	6.5	3.5	0.0	7.5
K Shailja	4.0	0.0	7.0	5.0	0.0	9.0	6.0	0.0	9.5
K Gaurav	3.0	0.0	5.0	4.0	0.0	6.5	5.0	0.0	7.5
K Garima	2.0	0.0	6.0	2.5	0.0	6.5	3.5	0.0	8.0
K Pushkar	4.0	0.0	7.0	5.0	0.0	8.0	7.0	0.0	8.8
K Lalima	5.0	0.0	6.5	6.5	0.0	8.0	8.0	0.0	9.0
K Khyati	4.5	0.0	5.5	5.5	0.0	7.0	7.0	0.0	8.0
K Pukhraj	5.0	0.0	4.0	6.0	0.0	5.0	8.0	0.0	7.0
K Ashoka	5.5	0.0	6.0	7.0	0.0	7.0	9.0	0.0	7.5

#### KALYANI

**Table 334:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	96.67	3.15	4.33	15.73	13.21	18.27
K Himalini	94.67	3.07	4.67	11.78	9.52	14.89
K Shailja	100.00	3.24	3.33	9.61	7.74	14.88
K Gaurav	96.67	2.65	4.67	21.17	18.44	15.68
K Garima	97.33	3.23	3.67	26.28	24.32	16.97
K Pushkar	98.67	3.20	4.00	26.73	23.00	16.18
K Lalima	100.00	3.12	3.67	24.39	21.98	17.26
K Khyati	98.67	3.10	4.67	26.84	25.10	17.43
K Pukhraj	98.67	2.82	4.67	21.39	18.38	16.29
K Ashoka	98.00	2.87	4.67	19.72	16.35	17.16
SEd	1.80	0.07	0.53	1.45	1.08	0.34
CD (0.05)	NS	0.15	NS	3.06	2.29	0.73
CV (%)	2.25	2.81	15.28	8.70	7.43	2.54

**Table 335:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	96.67	3.19	4.33	35.74	21.33	19.59	19.63
K Himalini	94.67	3.08	4.67	40.73	16.50	14.38	18.88
K Shailja	100.00	3.21	3.33	40.29	16.67	15.05	18.67
K Gaurav	100.00	2.71	4.67	35.62	38.56	36.17	16.82
K Garima	99.33	3.56	3.67	30.74	37.17	34.39	18.32
K Pushkar	98.67	3.22	4.00	21.24	38.01	34.28	17.14
K Lalima	100.00	3.37	3.67	30.70	35.06	32.73	19.26
K Khyati	100.00	3.18	4.67	37.42	35.23	32.28	18.53
K Pukhraj	98.67	2.88	4.67	28.99	40.28	36.28	17.76
K Ashoka	97.33	2.84	4.67	33.33	32.28	29.84	17.36
SEd	0.74	0.16	0.53	0.47	1.59	1.41	0.23
CD (0.05)	1.58	0.34	NS	0.99	3.37	2.99	0.48
CV (%)	0.92	6.23	15.28	1.71	6.26	6.06	1.51

**Table 336:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	96.67	3.15	4.33	67.34	39.57	38.12	21.22
K Himalini	94.67	3.07	5.00	70.77	43.20	42.23	20.27
K Shailja	100.00	3.24	3.00	67.27	33.40	32.12	20.86
K Gaurav	100.00	2.65	4.67	68.21	37.89	36.17	19.74
K Garima	99.33	3.23	4.00	70.35	38.95	37.95	21.39
K Pushkar	98.67	3.20	4.00	71.37	38.57	37.12	19.54
K Lalima	100.00	3.12	4.33	68.44	39.84	39.01	21.89
K Khyati	100.00	3.10	4.33	72.14	41.79	40.84	97.59
K Pukhraj	98.67	2.82	5.00	73.97	43.35	41.90	20.11
K Ashoka	97.33	2.87	4.67	75.26	42.51	41.17	19.76
SEd	0.74	0.07	0.43	0.72	2.33	2.14	34.24
CD (0.05)	1.58	0.15	0.92	1.53	4.94	4.52	NS
CV (%)	0.92	2.81	12.24	1.26	7.16	6.77	148.52

**Table 337:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	
	60 days			75 days			90 days			
K Jyoti	Did not appear	Did not appear	10.0	Did not appear	7.4	11.3	10.0	9.0	12.0	
K Himalini			5.5		DNA	7.9	7.0	6.8	8.0	
K Shailja			DNA		6.6	5.8	8.3	8.0	8.2	
K Gaurav			7.5		5.8	8.9	6.3	6.3	9.0	
K Garima			4.0		DNA	6.5	6.8	7.6	7.0	7.7
K Pushkar			6.4		7.0	7.2	8.4	9.0	8.8	9.5
K Lalima			3.0		9.5	5.5	10.3	10.0	8.0	11.0
K Khyati			Did not appear		5.5	6.0	7.9	8.0	7.7	8.0
K Pukhraj			10.0		6.8	12.3	9.3	8.6	13.4	
K Ashoka			6.0		4.0	8.5	7.7	10.5	9.0	10.0

DNA = Did not appear

## KANPUR

**Table 338:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	82.33	3.34	4.13	14.98	7.36	5.56	9.38
K Bahar	95.00	2.67	4.63	21.05	15.42	11.14	10.38
K Badshah	87.66	3.14	3.88	18.20	18.30	15.03	10.93
K Gaurav	83.25	3.06	4.00	12.15	15.22	11.81	11.40
K Garima	83.33	2.89	3.88	11.95	17.08	14.64	12.45
K Pushkar	87.00	2.78	4.63	9.50	15.55	12.67	9.83
K Surya	85.66	3.00	4.00	11.90	13.11	9.20	9.28
K Khyati	89.00	3.67	3.50	7.00	17.92	14.06	8.53
K Pukhraj	92.00	3.89	3.50	6.50	18.67	15.86	9.10
K Lauvkar	89.00	2.95	3.25	12.34	11.72	10.39	8.50
SEd	2.26	0.42	0.27	0.59	2.01	1.76	0.23
CD (0.05)	4.66	NS	0.56	1.22	4.15	3.64	0.47
CV (%)	3.66	19.07	9.68	6.64	18.93	20.73	3.24

**Table 339:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	83.97	3.53	4.88	24.88	11.81	7.84	13.48
K Bahar	95.58	2.58	4.38	31.80	27.41	22.97	14.48
K Badshah	88.36	3.17	4.31	29.10	29.47	23.91	14.98
K Gaurav	83.86	3.28	4.50	26.40	33.17	24.78	15.43
K Garima	83.35	2.67	4.19	35.00	33.72	26.53	16.50
K Pushkar	86.65	3.00	4.75	30.50	34.94	29.58	13.75
K Surya	86.22	2.75	4.50	33.30	19.17	17.09	14.43
K Khyati	88.15	3.61	4.00	29.88	38.25	31.44	12.60
K Pukhraj	92.79	4.11	4.50	27.88	41.72	34.47	14.23
K Lauvkar	90.39	2.75	4.00	31.63	21.53	19.25	12.53
SEd	2.16	0.33	0.25	1.03	2.27	2.33	0.21
CD (0.05)	4.45	0.68	0.51	2.13	4.69	4.80	0.44
CV (%)	3.47	14.78	7.91	4.86	11.04	13.84	2.12

**Table 340:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Wt of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	83.64	3.50	3.63	49.78	14.44	10.69	0.30	18.80
K Bahar	94.20	2.92	3.13	74.23	31.61	28.06	0.30	18.53
K Badshah	88.37	3.25	3.63	60.38	34.33	30.55	0.14	19.98
K Gaurav	83.85	3.31	3.50	56.38	39.86	33.61	0.19	19.40
K Garima	84.00	3.06	3.50	65.05	43.91	37.78	0.39	20.53
K Pushkar	88.30	2.61	3.88	59.88	40.16	33.19	0.36	18.93
K Surya	86.28	3.19	3.25	65.13	23.55	20.83	0.25	20.35
K Khyati	89.75	3.95	3.19	47.63	45.17	39.00	0.41	17.78
K Pukhraj	92.53	4.06	3.38	39.93	48.44	40.19	0.62	20.03
K Lauvkar	89.95	2.69	3.25	65.98	27.58	23.33	0.73	19.65
SEd	2.12	0.39	0.27	5.34	1.99	1.85	0.08	0.19
CD (0.05)	4.37	0.79	NS	11.01	4.11	3.82	0.15	0.40
CV (%)	3.40	16.74	11.21	12.92	8.07	8.81	28.64	1.41

**Table 341:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	60 days			75 days			90 days		
K Jyoti	Did not appear			8	4	4	12	8	6
K Bahar				9	7	4	15	10	8
K Badshah				Did not appear	Did not appear	Did not appear	12	9	5
K Gaurav							10	7	3
K Garima							11	5	4
K Pushkar							15	8	6
K Surya							14	10	8
K Khyati							15	9	8
K Pukhraj							16	10	9
K Lauvkar							14	12	7

**KOTA****Table 342:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	94.62	3.33	4.67	85.00	22.33	19.96	2.56	21.33
K Bahar	91.89	3.96	4.00	89.00	19.55	17.33	2.15	22.13
K Badshah	88.70	4.04	4.00	90.00	15.56	13.37	1.85	19.00
K Gaurav	91.59	4.89	4.17	90.00	15.78	13.70	1.78	19.40
K Garima	94.63	3.37	4.33	83.33	20.18	18.22	2.29	19.50
K Pushkar	93.41	4.34	4.17	88.33	18.88	16.55	2.44	20.30
K Surya	92.00	4.04	4.00	90.00	16.00	13.89	2.18	22.43
K Khyati	94.22	4.78	4.67	85.00	21.07	18.96	2.30	20.57
K Pukhraj	94.07	4.22	4.33	86.67	17.03	15.11	2.04	20.60
K Lauvkar	89.00	3.08	4.00	90.67	15.45	13.07	2.29	19.93
SEd	1.39	0.46	0.19	1.92	0.57	0.56	0.17	0.50
CD (0.05)	2.94	0.98	0.40	4.06	1.20	1.18	0.36	1.06
CV (%)	1.84	14.08	5.52	2.68	3.83	4.27	9.58	2.98

**MODIPURAM****Table 343:** Plant emergence (%), seed wt. (t/ha), plant vigor (1-5 scale), foliage senescence (1-5 scale), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Foliage Senescence (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	92.78	4.86	3.83	2.17	16.46	12.01	13.47
K Bahar	97.22	5.28	4.17	2.33	21.14	16.95	13.27
K Sadabahar	93.33	4.21	4.33	2.00	16.40	11.25	13.41
K Gaurav	92.78	2.88	4.00	2.00	17.17	12.63	12.57
K Garima	96.11	5.51	4.17	2.00	20.60	15.67	13.77
K Pushkar	94.45	3.84	4.00	2.00	15.99	9.22	12.77
K Khyati	92.22	5.79	4.00	2.00	20.09	14.44	12.37
K Pukhraj	92.22	4.63	3.33	2.17	17.88	14.04	13.33
SEd	1.71	0.29	0.18	0.07	0.83	0.67	0.20
CD (0.05)	NS	0.63	0.39	0.14	1.80	1.45	0.42
CV (%)	2.23	7.72	5.57	3.83	5.60	6.16	1.83

**Table 344:** Plant emergence (%), seed wt. (t/ha), plant vigor (1-5 scale), foliage senescence (1-5 scale), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Foliage Senescence (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	91.67	4.31	4.17	3.07	31.94	28.24	14.83
K Bahar	97.78	6.02	4.50	3.13	32.88	26.94	16.33
K Sadabahar	90.56	5.23	4.67	2.53	22.79	18.69	14.83
K Gaurav	85.56	2.48	4.33	2.50	21.82	17.23	13.37
K Garima	95.00	5.00	5.00	2.53	32.86	29.50	13.70
K Pushkar	95.00	4.22	4.50	3.00	35.43	26.90	13.70
K Khyati	91.67	6.16	4.00	2.87	38.62	34.32	13.43
K Pukhraj	95.55	4.54	3.83	3.07	33.92	29.85	13.70
SEd	3.70	0.37	0.15	0.09	0.95	0.95	0.17
CD (0.05)	NS	0.79	0.33	0.20	2.07	2.06	0.37
CV (%)	4.88	9.46	4.23	3.88	3.73	4.40	1.45

**Table 345:** Plant emergence (%), seed wt. (t/ha), plant vigor (1-5 scale), foliage senescence (1-5 scale), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Foliage Senescence (1-5 scale)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	3.89	96.11	4.00	3.23	42.87	39.26	15.73
K Bahar	3.52	91.11	4.00	3.53	43.98	39.22	18.10
K Sadabahar	4.49	92.22	5.00	3.00	39.64	34.96	16.47
K Gaurav	2.87	90.00	4.50	3.00	40.98	35.33	15.63
K Garima	4.82	92.22	5.00	3.00	47.04	40.97	15.47
K Pushkar	4.21	98.33	4.17	3.07	47.31	42.00	14.73
K Khyati	5.83	90.56	4.00	3.00	55.09	49.84	13.50
K Pukhraj	3.94	95.00	3.00	3.07	46.30	42.31	14.00
SEd	0.31	3.23	0.08	0.08	0.99	1.27	0.23
CD (0.05)	0.67	NS	0.18	0.18	2.14	2.74	0.50
CV (%)	8.98	4.24	2.43	3.20	2.66	3.83	1.82

**Table 346:** Total weight loss after 3 months storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rotting Weight basis	Total wt. Losses (%)
		At 6 weeks	End of storage (75days)			
K Jyoti	> 6 weeks	0.00	0.00	0.00	1.60	10.03
K Bahar	<6 weeks	87.81	87.81	0.11	0.44	12.74
K Sadabahar	> 6 weeks	70.46	70.46	0.41	1.55	12.32
K Gaurav	> 6 weeks	0.00	57.63	0.10	9.79	16.23
K Garima	> 6 weeks	12.43	23.91	0.03	1.01	17.95
K Pushkar	> 6 weeks	0.00	0.00	0.00	0.00	9.14
K Khyati	> 6 weeks	0.00	3.38	0.01	8.30	14.23
K Pukhraj	> 6 weeks	12.36	46.12	0.10	0.52	9.52

## PANTNAGAR

**Table 347:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant vigor	Total yield (t/ha)	Mkt yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	96.33	7.11	4.00	23.33	22.85	19.92	0.83	16.43
K Bahar	96.67	6.52	3.33	21.00	23.92	21.55	0.61	15.50
K Sadabahar	97.00	6.44	4.00	17.67	23.63	21.18	0.55	15.67

K Gaurav	96.67	5.11	3.33	18.00	25.29	26.18	0.42	15.33
K Garima	95.67	6.15	4.00	18.33	22.03	19.59	0.67	15.37
K Pushkar	97.00	7.11	4.00	18.67	23.55	21.33	0.63	15.53
K Khyati	97.00	6.15	4.67	18.00	28.26	26.70	0.65	15.80
K Pukhraj	96.33	6.55	4.33	17.67	23.55	21.41	0.56	14.93
SEd	0.95	0.25	0.45	0.82	0.63	1.78	0.13	0.14
CD (0.05)	NS	0.55	NS	1.78	1.37	3.85	NS	0.30
CV (%)	1.20	4.88	14.06	5.29	3.21	9.79	25.67	1.09

**Table 348:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant vigor	Total yield (t/ha)	Mkt yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	96.33	7.04	4.00	65.00	25.18	22.48	0.91	17.23
K Bahar	96.67	5.89	3.33	62.00	25.85	22.77	0.80	16.47
K Sadabahar	97.00	6.00	4.00	60.00	25.41	22.70	0.63	16.27
K Gaurav	96.67	4.63	3.33	64.00	26.96	24.37	0.68	16.10
K Garima	96.67	5.11	3.67	62.33	23.44	21.00	0.52	16.33
K Pushkar	97.00	6.15	3.67	65.00	24.96	23.00	0.74	16.40
K Khyati	96.33	6.26	4.00	68.33	29.81	27.77	0.50	16.83
K Pukhraj	97.00	6.18	4.00	70.00	25.11	22.44	0.72	15.53
SEd	0.81	0.17	0.36	1.42	0.88	0.83	0.18	0.16
CD (0.05)	NS	0.37	NS	3.07	1.91	1.79	NS	0.35
CV (%)	1.03	3.57	11.64	2.69	4.19	4.35	31.99	1.20

**Table 349:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant vigor	Total yield (t/ha)	Mkt yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	97.00	6.26	4.00	96.67	27.48	25.03	1.44	17.60
K Bahar	97.00	5.15	3.33	97.00	27.48	25.00	1.29	16.73
K Sadabahar	97.00	6.15	4.00	97.00	26.92	24.26	1.13	16.77
K Gaurav	97.00	5.96	3.33	97.00	28.59	26.22	0.98	16.40
K Garima	96.33	4.63	3.67	95.67	25.74	21.96	1.02	16.57
K Pushkar	97.00	5.93	3.67	95.67	26.04	23.81	0.90	16.97
K Khyati	97.00	6.04	4.67	97.33	31.00	28.48	1.18	17.20
K Pukhraj	97.00	6.04	4.00	97.00	26.96	25.00	0.90	15.97
SEd	0.73	0.10	0.38	0.55	0.73	0.69	0.19	0.15
CD (0.05)	NS	0.21	NS	NS	1.58	1.50	NS	0.33
CV (%)	0.92	2.06	12.08	0.70	3.25	3.40	20.88	1.11

**Table 350:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	60 days			75 days			90 days		
K Jyoti	5	0	0	5	0	0	5	0	0
K Bahar	6	0	0	6	0	0	6	0	0
K Sadabahar	4	0	0	4	0	0	4	0	0
K Gaurav	5	0	0	5	0	0	5	0	0
K Garima	5	0	0	5	0	0	5	0	0
K Pushkar	5	0	0	5	0	0	5	0	0
K Khyati	4	0	0	5	0	0	5	0	0
K Pukhraj	5	0	0	5	0	0	5	0	0



## PASIGHAT

**Table 351:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant vigor	Total yield (t/ha)	Mkt yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	93.80	2.19	86.75	3.38	29.44	28.75	0.70	18.55
K Himalini	90.35	2.11	84.75	3.38	28.61	27.91	0.70	20.83
K Shailja	93.85	2.06	83.75	3.25	27.50	26.66	0.84	20.60
K Garima	92.00	2.14	85.50	3.13	28.33	27.36	0.97	19.75
K Pushkar	91.80	2.33	84.25	3.38	31.94	30.69	1.25	22.18
K Lalima	97.90	2.25	87.00	3.50	30.56	29.58	0.97	20.65
K Khyati	93.98	2.11	84.50	3.13	23.33	22.22	1.11	24.53
K Ashoka	96.50	2.11	82.75	3.38	23.33	22.64	0.70	23.95
SEd	2.12	0.09	2.37	0.23	1.75	1.76	0.19	0.44
CD (0.05)	4.44	NS	NS	NS	3.66	3.68	0.39	0.91
CV (%)	3.20	5.81	3.94	9.74	8.86	9.21	28.99	2.89

**Table 352:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant vigor	Total yield (t/ha)	Mkt yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	94.85	2.17	86.50	4.00	32.50	31.66	0.84	18.88
K Himalini	91.10	2.03	87.75	3.63	30.00	29.03	0.97	20.55
K Shailja	93.15	2.06	87.50	3.50	28.61	27.50	1.11	20.80
K Garima	93.35	2.14	90.25	3.75	31.39	30.14	1.25	19.83
K Pushkar	91.80	2.28	89.00	3.88	33.89	32.78	1.25	21.93
K Lalima	96.05	2.06	91.25	4.25	33.33	32.08	1.25	20.70
K Khyati	91.45	2.11	94.25	3.63	25.55	24.03	1.53	24.13
K Ashoka	95.65	2.06	88.75	3.88	23.61	22.50	1.11	24.18
SEd	2.14	0.09	3.09	0.27	1.69	1.63	0.27	0.38
CD (0.05)	NS	NS	NS	NS	3.53	3.41	NS	0.79
CV (%)	3.24	5.91	4.89	9.91	8.00	8.02	33.21	2.49

**Table 353:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant vigor	Total yield (t/ha)	Mkt yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	94.10	2.08	91.50	4.13	35.27	34.02	1.25	18.98
K Himalini	93.15	1.97	88.75	3.88	29.44	28.47	0.97	20.55
K Shailja	91.85	1.97	91.75	3.75	30.56	29.30	1.25	21.03
K Garima	91.80	2.14	90.00	3.88	30.55	29.58	0.97	19.85
K Pushkar	91.85	2.31	90.00	4.13	37.50	36.11	1.39	21.75
K Lalima	97.90	2.11	94.25	4.38	38.05	36.80	1.25	20.63
K Khyati	93.85	2.17	94.25	3.63	24.44	23.47	0.97	24.18
K Ashoka	96.05	2.11	94.25	3.75	27.22	26.25	0.97	24.10
SEd	2.24	0.13	2.73	0.28	2.60	2.49	0.20	0.39
CD (0.05)	NS	NS	NS	NS	5.44	5.22	NS	0.82
CV (%)	3.38	8.38	4.21	10.09	11.63	11.56	24.99	2.60

**Table 354:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
K Jyoti	3.2	1.5	2.8	4.1	2.2	4.5	3.4	3.5	6.0
K Himalini	4.1	3.8	5.0	5.3	4.0	4.7	4.8	4.3	5.5
K Shailja	4.5	4.0	4.7	6.7	3.1	5.0	5.5	4.4	4.5
K Garima	4.9	4.8	5.6	4.3	4.9	6.1	6.1	5.1	6.4
K Pushkar	2.7	3.5	2.7	4.1	3.7	4.2	4.2	3.2	5.0
K Lalima	2.9	3.2	2.5	3.8	3.2	4.5	3.7	2.9	4.8
K Khyati	4.5	4.1	4.8	5.6	5.5	6.0	5.2	4.8	6.4
K Ashoka	4.2	4.5	4.3	5.9	4.8	5.9	5.5	5.0	6.3

**Table 355:** Total weight loss after 75 days storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt. Loss due to sprouting (At the end of storage of 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
K Jyoti	> 6 weeks	0.0	5.2	1.8	8.9	7.1	8.9
K Himalini	> 6 weeks	0.0	4.6	2.0	7.8	7.5	9.5
K Shailja	> 6 weeks	0.0	4.1	1.9	7.2	8.2	10.1
K Garima	> 6 weeks	0.0	3.9	1.8	8.5	9.0	10.8
K Pushkar	> 6 weeks	0.0	4.6	2.1	7.8	8.6	10.7
K Lalima	> 6 weeks	0.0	4.8	1.9	8.6	7.9	9.8
K Khyati	> 6 weeks	0.0	6.8	2.2	9.5	8.8	11.0
K Ashoka	> 6 weeks	0.0	5.9	1.7	8.5	7.8	9.5

**PATNA****Table 356:** Plant emergence (%), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	87.00	3.67	19.33	18.96	15.72	17.00
K Himalini	86.00	2.67	14.33	17.06	13.50	13.83
K Shailja	87.00	3.33	15.00	17.47	14.94	14.63
K Gaurav	89.00	3.67	14.00	21.24	18.14	17.13
K Garima	86.00	3.33	15.67	18.14	14.92	16.77
K Pushkar	88.00	3.67	15.00	20.66	17.19	17.50
K Lalima	84.67	2.67	14.67	20.10	16.27	17.90
K Khyati	83.33	3.67	16.33	21.43	19.33	15.57
K Pukhraj	88.00	3.00	16.33	21.88	19.07	16.50
K Ashoka	85.00	3.67	18.33	17.44	14.68	14.63
SEd	2.46	0.51	0.66	1.31	1.47	0.37
CD (0.05)	NS	NS	1.40	2.78	3.11	0.78
CV (%)	3.48	18.62	5.11	8.28	10.98	2.79

**Table 357:** Plant emergence (%), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	88.33	3.67	72.00	20.93	17.90	17.50

K Himalini	86.67	3.33	54.67	18.46	15.91	14.50
K Shailja	87.67	4.00	58.67	19.76	17.35	15.63
K Gaurav	90.33	3.00	63.33	23.92	20.96	17.73
K Garima	91.33	3.67	62.33	19.98	17.47	17.20
K Pushkar	90.33	3.33	62.00	22.56	19.74	18.00
K Lalima	92.67	3.67	63.33	21.44	19.14	18.10
K Khyati	88.33	3.67	63.67	23.80	21.23	16.43
K Pukhraj	89.33	3.33	66.33	25.50	23.30	16.40
K Ashoka	89.00	3.67	73.67	21.05	18.31	15.90
SEd	2.02	0.41	1.81	1.21	1.42	0.30
CD (0.05)	NS	NS	3.83	2.57	3.00	0.64
CV (%)	2.76	14.10	3.46	6.84	9.06	2.21

**Table 358:** Plant emergence (%), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Dry matter (%)
K Jyoti	91.33	3.00	81.33	23.73	20.86	18.67
K Himalini	90.33	3.00	75.00	21.30	18.73	15.90
K Shailja	91.67	3.67	72.33	22.48	20.47	16.87
K Gaurav	89.00	3.33	72.67	26.58	23.62	18.33
K Garima	87.67	3.67	70.00	23.13	20.09	17.57
K Pushkar	91.00	3.00	72.33	25.53	22.62	18.23
K Lalima	89.33	3.33	76.33	24.18	21.84	19.17
K Khyati	91.67	3.00	78.67	27.19	24.57	17.23
K Pukhraj	88.67	3.00	81.67	28.69	26.21	17.57
K Ashoka	87.33	3.33	90.00	23.67	21.62	17.73
SEd	2.00	0.68	1.30	1.25	1.22	0.31
CD (0.05)	NS	NS	2.75	2.64	2.59	0.66
CV (%)	2.72	25.74	2.06	6.19	6.78	2.17

**Table 359:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
K Jyoti	Did no appear	Did no appear	2	Did no appear	Did no appear	2	Did no appear	Did no appear	2
K Himalini			1			2			
K Shailja			1			3			
K Gaurav			2			2			
K Garima			2			3			
K Pushkar			2			2			
K Lalima			2			2			
K Khyati			2			3			
K Pukhraj			3			4			
K Ashoka			2			2			

## PUNE

**Table 360:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	89.33	3.61	3.09	13.02	12.63	0.39	18.11
K Bahar	90.33	3.96	3.25	10.91	10.41	0.50	17.15

K Pushkar	91.85	3.65	3.11	10.33	9.81	0.52	17.74
K Surya	93.78	3.93	3.90	13.48	13.15	0.33	19.20
K Khyati	91.44	4.20	3.83	13.52	13.15	0.37	17.79
K Pukhraj	90.67	3.80	3.38	13.30	12.74	0.56	17.25
K Lauvkar	90.67	3.56	3.08	13.05	12.55	0.50	18.19
SEd	0.89	0.20	0.15	0.40	0.40	0.05	0.06
CD (0.05)	1.97	NS	0.32	0.87	0.88	0.11	0.14
CV (%)	1.20	6.51	5.31	3.87	4.05	13.43	0.43

**Table 361:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	88.67	3.57	81.03	3.08	13.54	12.80	0.74	18.26
K Bahar	92.33	4.04	82.00	3.05	12.05	11.39	0.67	17.13
K Pushkar	90.00	3.64	80.33	2.93	10.96	10.31	0.65	18.45
K Surya	92.67	3.98	77.98	4.02	15.35	14.89	0.46	20.23
K Khyati	91.00	3.19	77.68	3.50	14.22	13.72	0.50	17.78
K Pukhraj	92.33	3.18	80.80	2.92	13.63	12.89	0.74	17.30
K Lauvkar	90.33	3.33	82.33	2.89	13.48	12.76	0.72	18.15
SEd	1.58	0.24	2.01	0.21	0.22	0.24	0.04	0.08
CD (0.05)	NS	0.52	NS	0.45	0.49	0.52	0.09	0.17
CV (%)	2.13	8.09	3.07	7.84	2.04	2.29	7.73	0.53

**Table 362:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	89.33	3.41	85.40	3.04	14.76	13.28	1.49	17.79
K Bahar	89.67	2.95	85.39	2.83	14.02	12.54	1.48	18.15
K Pushkar	92.00	3.89	86.00	3.07	13.15	11.63	1.52	18.39
K Surya	91.33	3.73	83.18	4.08	16.90	16.09	0.82	20.34
K Khyati	91.00	3.44	81.70	3.17	15.18	14.31	0.87	17.81
K Pukhraj	91.00	3.56	85.24	2.83	14.93	13.48	1.44	16.42
K Lauvkar	89.00	3.78	87.00	2.92	14.87	13.24	1.63	18.27
SEd	1.85	0.27	1.83	0.24	0.24	0.24	0.09	0.08
CD (0.05)	NS	NS	NS	0.52	0.54	0.54	0.19	0.18
CV (%)	2.50	9.49	2.64	9.18	2.01	2.21	7.99	0.54

**Table 363:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
K Jyoti	1.3	18.7	4.0	5.3	21.3	10.7	6.7	28.0	10.7
K Bahar	0.0	16.0	8.0	6.7	24.0	10.7	12.0	32.0	13.3
K Pushkar	0.0	17.3	6.7	4.0	18.7	5.3	9.3	18.7	5.3
K Surya	1.3	14.7	1.3	4.0	12.0	2.7	5.3	13.3	2.7
K Khyati	2.7	21.3	2.7	6.7	22.7	4.0	14.7	25.3	8.0
K Pukhraj	0.0	20.0	1.3	10.7	16.0	4.0	16.0	24.0	4.0
K Lauvkar	0.0	16.0	4.0	14.7	20.0	5.3	20.0	29.3	9.3

## RAIPUR

**Table 364:** Plant emergence (%), seed wt (t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	90.00	2.10	3.31	12.48	5.95	0.79	18.21
K Bahar	90.42	2.17	3.25	13.47	7.60	0.78	18.12
K Badshah	91.25	2.13	4.06	11.48	7.40	0.12	18.86
K Garima	90.00	2.05	4.69	13.00	7.86	0.71	18.74
K Pushkar	90.00	2.11	4.38	15.03	12.09	0.38	18.16
K Surya	90.42	2.25	4.94	15.48	11.58	0.09	19.49
K Khyati	91.25	2.13	4.94	14.49	7.95	0.91	18.53
K Pukhraj	90.00	2.09	4.75	15.31	9.18	1.15	18.17
SEd	2.27	0.10	0.20	0.20	0.18	0.08	0.14
CD (0.05)	NS	NS	0.41	0.42	0.37	0.16	0.30
CV (%)	3.55	6.87	6.51	2.04	2.84	17.96	1.09

**Table 365:** Plant vigor (1-5 scale), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 75 days crop.

Hybrid/variety	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	3.99	14.94	20.38	13.39	1.36	19.51
K Bahar	3.38	18.58	22.23	13.83	2.25	19.35
K Badshah	3.75	17.86	19.01	13.04	1.54	19.00
K Garima	4.75	15.34	21.43	13.89	1.91	20.03
K Pushkar	4.38	12.82	23.91	14.95	2.22	19.74
K Surya	4.94	13.11	23.16	15.39	2.11	20.36
K Khyati	4.75	13.41	23.02	14.67	2.24	19.47
K Pukhraj	4.50	13.85	22.44	14.55	3.42	19.17
SEd	0.25	0.71	0.30	0.21	0.15	0.13
CD (0.05)	0.53	1.49	0.63	0.45	0.32	0.27
CV (%)	8.36	6.71	1.93	2.13	10.14	0.94

**Table 366:** Plant vigor (1-5 scale), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Plant vigor	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
K Jyoti	2.13	93.30	24.04	16.06	1.42	21.48
K Bahar	2.88	93.42	24.86	16.76	2.20	21.78
K Badshah	3.25	94.95	23.55	15.03	2.58	20.15
K Garima	3.69	89.94	25.95	17.06	1.67	21.13
K Pushkar	4.06	92.87	29.43	21.81	1.68	20.01
K Surya	4.56	85.23	32.05	24.26	1.71	21.61
K Khyati	4.50	86.66	31.52	23.92	2.67	20.10
K Pukhraj	4.49	88.86	30.54	23.52	3.31	19.87
SEd	0.21	1.51	0.85	0.86	0.08	0.10
CD (0.05)	0.44	3.16	1.79	1.80	0.17	0.20
CV (%)	7.99	2.36	4.35	6.14	5.45	0.65

**Table 367:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
K Jyoti	Did no appear	Did no appear	Did no appear	Did no appear	16.7	25.0	Did no appear	25.0	35.0
K Bahar					23.3	31.7		30.0	40.0
K Badshah					15.0	23.3		23.3	31.7
K Garima					10.0	21.7		28.3	18.3
K Pushkar					13.3	18.3		20.0	30.0
K Surya					8.3	15.0		10.0	23.3
K Khyati					11.7	18.3		16.7	28.3
K Pukhraj					13.3	25.0		13.3	31.7

**Table 368:** Total weight loss after 75 days storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt. Loss due to sprouting (At the end of storage of 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
K Jyoti	> 6 weeks	Nil	Nil	0	30	23.68	25.19
K Bahar	> 6 weeks	Nil	Nil	0	30	23.96	26.11
K Badshah	> 6 weeks	Nil	Nil	0	40	31.85	33.50
K Garima	> 6 weeks	Nil	Nil	0	30	24.83	26.73
K Pushkar	> 6 weeks	Nil	Nil	0	30	17.96	30.32
K Surya	> 6 weeks	Nil	Nil	0	40	32.04	33.47
K Khyati	> 6 weeks	Nil	Nil	0	40	43.22	40.40
K Pukhraj	> 6 weeks	Nil	Nil	0	30	24.44	26.11

**POOLED OVER THE YEAR (2015-16 & 2016-17)****Table 368.1:** Yield (t/ha) performance under northern plains (HIS, MDP & PNT) at 60 days

Genotypes	HIS	MDP	PNT	Mean	HIS	MDP	PNT	Mean
	Total yield (t/ha)				Marketable yield (t/ha)			
K Bahar	18.62	21.72	22.84	21.06	15.17	17.76	20.99	17.97
K Garima	22.29	21.41	21.16	21.62	16.99	16.71	19.15	17.61
K Jyoti	14.24	17.41	21.75	17.80	11.88	12.94	19.38	14.73
K Khyati	26.69	20.84	27.44	24.99	18.68	16.19	26.13	20.33
K Pukhraj	20.31	21.24	23.50	21.68	16.38	16.75	21.74	18.29
K Pushkar	28.49	20.67	22.37	23.84	20.26	14.98	20.78	18.67
K Sadabahar	17.68	16.87	23.40	19.32	14.06	12.99	21.59	16.21
Mean B	21.19	20.02	23.21		16.20	15.47	21.39	
CD (5%)	Locations =1.47; Genotypes = 2.24; Location x Genotype =3.88				Locations = 0.79; Genotypes = 1.22 Location x Genotype =2.11			

**Table 368.2:** Yield (t/ha) performance under northern plains (HIS, MDP & PNT) at 75 days

Genotypes	HIS	MDP	PNT	Mean	HIS	MDP	PNT	Mean
	Total yield (t/ha)				Marketable yield (t/ha)			
K Bahar	31.45	31.44	24.60	29.16	25.26	27.18	22.38	24.94
K Garima	30.67	33.02	22.57	28.75	27.01	29.63	20.54	25.73
K Jyoti	24.00	27.30	23.79	25.03	21.06	23.72	21.55	22.11
K Khyati	30.55	35.26	28.99	31.60	26.80	31.85	27.12	28.59
K Pukhraj	32.01	33.56	24.82	30.13	27.38	28.81	22.86	26.35

K Pushkar	35.07	35.62	23.97	31.55	28.67	27.75	22.14	26.18
K Sadabahar	22.02	24.79	25.01	23.94	19.32	20.81	21.07	20.40
Mean B	29.40	31.57	24.82		25.07	27.11	22.52	
CD (5%)	Locations =1.38; Genotypes = 2.10; Location x Genotype = 3.64				Locations = 1.03; Genotypes =1.58 Location x Genotype = 2.74			

**Table 368.3:** Yield (t/ha) performance under northern plains (HIS, MDP & PNT) at 90 days

Genotypes	HIS	MDP	PNT	Mean	HIS	MDP	PNT	Mean	HIS	MDP	Mean	
	Total yield (t/ha)				Marketable yield (t/ha)							
K Bahar	34.37	40.18	26.05	33.53	32.15	36.18	24.10	30.81	17.71	17.93	17.82	
K Garima	39.01	42.75	24.33	35.37	33.50	37.60	21.67	30.92	18.71	17.28	17.99	
K Jyoti	30.58	36.59	25.50	30.89	28.50	32.50	23.59	28.20	15.48	17.19	16.34	
K Khyati	38.87	45.67	30.13	38.22	34.82	41.31	28.01	34.71	16.73	14.33	15.53	
K Pukhraj	29.77	42.56	26.37	32.90	26.67	37.49	24.61	29.59	16.59	15.87	16.23	
K Pushkar	43.92	45.38	25.03	38.11	38.24	40.43	23.27	33.98	13.31	15.95	14.63	
K Sadabahar	25.23	37.33	26.43	29.66	22.68	32.72	24.26	26.55	18.77	16.21	17.49	
Mean B	34.53	41.50	26.26		30.94	36.89	24.21		16.76	16.39		
CD (5%)	Locations=1.13; Genotypes= 1.72; Location x Genotype = 2.99				Locations =1.05; Genotypes =1.60 Location x Genotype = 2.77				Locations = NS; Genotypes =0.92 Location x Genotype = 1.30			

**Table 368.4:** Yield (t/ha) performance under central plains (CHN, GWL, KAN & RPR) at 60 days

Genotypes	CHN	GWL	KAN	RPR	Mean	CHN	GWL	KAN	RPR	Mean
	Total yield (t/ha)					Marketable yield (t/ha)				
K Bahar	16.82	16.77	18.36	14.43	16.59	11.34	15.46	14.60	11.38	13.19
K Garima	19.31	18.31	18.93	13.08	17.40	13.80	16.97	15.75	10.39	14.23
K Jyoti	18.76	19.52	14.18	13.24	16.42	13.56	17.58	10.48	9.89	12.88
K Khyati	20.94	25.72	19.48	15.98	20.53	15.72	22.82	15.18	12.59	16.58
K Pukhraj	21.07	23.64	19.75	15.44	19.98	15.96	21.61	15.60	12.28	16.36
K Pushkar	22.27	23.62	17.61	13.64	19.28	16.96	20.30	14.61	12.08	15.99
Mean	19.86	21.26	18.05	14.30		14.56	19.12	14.37	11.43	
CD (5%)	Locations =0.95; Genotypes =1.17 Location x Genotype =2.33					Locations =0.85; Genotypes =1.05 Location x Genotype =2.09				

**Table 368.5:** Yield (t/ha) performance under central plains (CHN, GWL, KAN & RPR) at 75 days

Genotypes	CHN	GWL	KAN	RPR	Mean	CHN	GWL	KAN	RPR	Mean
	Total yield (t/ha)					Marketable yield (t/ha)				
K Bahar	22.92	26.63	27.48	23.46	25.12	18.43	25.71	22.96	18.14	21.31
K Garima	25.17	34.58	30.97	21.33	28.01	20.37	34.24	24.50	17.08	24.05
K Jyoti	24.13	26.51	21.44	20.73	23.20	20.07	26.21	16.29	16.37	19.74
K Khyati	30.58	38.45	36.04	25.11	32.55	25.85	37.36	29.47	19.10	27.95
K Pukhraj	29.47	34.38	38.22	26.10	32.04	24.91	33.08	31.44	20.60	27.51
K Pushkar	28.87	32.98	32.57	21.88	29.07	24.56	31.91	26.98	15.71	24.79
Mean	26.86	32.26	31.12	23.10		22.37	31.42	25.27	17.84	
CD (5%)	Locations =1.29; Genotypes =1.58 Location x Genotype =3.16					Locations =1.28; Genotypes =1.57 Location x Genotype =3.14				

**Table 368.6:** Yield (t/ha) and dry mater (%) under central plains (CHN, DES, GWL, KAN, KTT & RPR) at 90 days

Genotypes	CHN	DES	GWL	KAN	KTT	RPR	Mean
	Total yield (t/ha)						
K Bahar	25.32	31.38	29.61	31.23	16.26	23.64	26.24
K Garima	35.72	46.67	36.75	37.76	18.08	24.32	33.22
K Jyoti	27.53	35.53	31.49	24.40	17.93	22.76	26.61
K Khyati	34.74	54.50	42.95	41.21	17.04	28.80	36.54
K Pukhraj	33.31	57.93	41.62	43.43	17.64	27.24	36.86
K Pushkar	34.94	52.18	39.68	36.96	19.24	27.28	35.05

Mean	31.93	46.36	37.02	35.83	17.70	25.67	
CD (5%)	Locations = 1.04; Genotypes = 1.04; Location x Genotype =2.56						

Table contd.....

Genotypes	CHN	DES	GWL	KAN	KTT	RPR	Mean	CHN	DES	GWL	KAN	Mean
	Marketable yield (t/ha)							Dry matter (%)				
K Bahar	22.76	29.41	27.30	26.54	14.50	19.60	23.35	18.25	17.46	18.41	18.04	18.04
K Garima	27.94	44.08	34.47	31.93	16.36	19.87	29.11	17.28	20.54	19.13	19.04	19.00
K Jyoti	24.70	32.42	29.22	19.29	14.73	18.77	23.19	18.16	18.21	17.91	18.35	18.16
K Khyati	30.37	52.73	40.80	34.35	15.27	25.00	33.09	18.58	17.59	16.35	17.88	17.60
K Pukhraj	29.10	55.95	39.90	35.66	15.94	23.73	33.38	17.68	17.72	16.70	19.19	17.82
K Pushkar	30.00	48.95	36.93	30.18	16.84	23.47	31.06	18.24	17.85	17.99	18.61	18.17
Mean	27.48	43.92	34.77	29.66	15.60	21.74		18.03	18.23	17.75	18.52	
CD (5%)	Locations = 0.97; Genotypes = 0.97 Location x Genotype = 2.37							Locations = 0.27; Genotypes = 0.33; Location x Genotype = 0.65				

**Table 368.7:** Yield (t/ha) performance under eastern plains (BHN, FZB, JRH, KAL & PAS) at 60 days

Genotypes	BHN	FZB	JRH	KAL	PAS	Mean	BHN	FZB	JRH	KAL	PAS	Mean
	Total yield (t/ha)						Marketable yield (t/ha)					
K Bahar	13.90	18.90	14.61	22.31	32.75	20.49	13.07	15.32	10.03	20.64	31.91	18.19
K Garima	12.80	16.63	15.44	17.03	33.08	19.00	12.18	13.44	10.65	15.30	32.11	16.74
K Jyoti	13.57	18.34	14.56	14.34	33.02	18.77	12.71	14.40	9.61	12.52	32.05	16.26
K Khyati	14.07	20.53	15.91	20.59	33.20	20.86	12.92	16.64	12.13	19.24	32.23	18.63
K Pukhraj	14.78	19.59	15.84	17.81	31.11	19.82	13.47	15.82	11.23	15.75	30.14	17.28
K Pushkar	15.44	16.69	17.64	19.90	34.66	20.86	14.67	13.55	12.77	17.34	33.62	18.39
Mean	14.09	18.45	15.67	18.66	32.97		13.17	14.86	11.07	16.80	32.01	
CD (5%)	Locations = 0.59; Genotypes = 0.65 Location x Genotype =1.44						Locations =0.54; Genotypes = 0.60 Location x Genotype =1.33					

**Table 368.8:** Yield (t/ha) performance under eastern plains (BHN, FZB, JRH, KAL & PAS) at 75 days

Genotypes	BHN	FZB	JRH	KAL	PAS	Mean	BHN	FZB	JRH	KAL	PAS	Mean
	Total yield (t/ha)						Marketable yield (t/ha)					
K Bahar	15.22	31.53	19.36	30.12	34.62	26.17	14.27	27.75	12.88	29.56	34.59	23.81
K Garima	15.81	27.61	19.29	28.92	33.57	25.04	14.79	24.33	12.51	27.67	27.76	21.41
K Jyoti	17.33	29.55	17.96	20.78	34.62	24.05	16.15	25.44	11.72	19.69	27.81	20.16
K Khyati	17.64	34.28	19.06	30.34	35.35	27.33	16.49	30.17	13.42	29.01	34.69	24.76
K Pukhraj	16.43	32.78	20.38	32.45	32.50	26.91	15.24	28.86	12.30	28.92	31.53	23.37
K Pushkar	15.67	27.83	20.05	30.73	36.05	26.07	14.44	24.49	14.24	28.26	35.54	23.39
Mean	16.35	30.60	19.35	28.89	34.45		15.23	26.84	12.85	27.18	31.99	
CD (5%)	Locations = 0.65; Genotypes = 0.71 Location x Genotype = 1.59						Locations = 1.11; Genotypes = 1.21 Location x Genotype = 2.71					

**Table 368.9:** Yield (t/ha) performance under eastern plains (BHN, DHL, FZB, JRH, KAL, PAS & PAT) at 90 days

Genotypes	BHN	DHL	FZB	JRH	KAL	PAS	PAT	Mean
	Total yield (t/ha)							
K Bahar	13.96	15.92	36.15	21.21	34.43	34.80	26.44	26.13
K Garima	14.77	9.95	31.69	19.25	30.59	32.91	27.87	23.86
K Jyoti	14.87	14.79	34.09	20.90	32.92	36.66	27.80	26.00
K Khyati	13.32	17.27	39.41	20.78	36.54	38.89	32.03	28.32
K Pukhraj	13.73	12.58	37.60	22.37	34.84	34.00	33.26	26.91
K Pushkar	17.23	16.51	34.05	21.91	32.71	38.33	27.95	26.96
Mean	14.65	14.50	35.50	21.07	33.67	35.93	29.22	
CD (5%)	Locations = 0.69; Genotypes = 0.64; Location x Genotype = 1.69							



Table contd.....

Genotypes	BHN	DHL	FZB	JRH	KAL	PAS	PAT	Mean
	Marketable yield (t/ha)							
K Bahar	13.33	14.37	33.22	13.11	33.67	33.73	21.50	23.27
K Garima	13.87	8.50	29.17	10.99	29.56	31.68	23.71	21.07
K Jyoti	13.60	12.87	31.39	12.47	32.01	35.33	23.32	23.00
K Khyati	12.56	15.13	36.28	12.73	35.87	37.84	26.19	25.23
K Pukhraj	12.55	10.24	34.64	14.40	33.93	32.61	26.75	23.59
K Pushkar	15.87	13.55	29.44	13.26	31.84	36.88	23.61	23.49
Mean	13.63	12.44	32.36	12.82	32.81	34.68	24.18	
CD (5%)	Locations = 0.64; Genotypes = 0.59; Location x Genotype = 1.57							

**Table 368.10:** Dry mater (%) under eastern plains (BHN, DHL, FZB, JRH, KAL, PAS & PAT) at 90 days

Genotypes	BHN	DHL	FZB	JRH	KAL	PAS	PAT	Mean
	Dry matter (%)							
K Bahar	18.23	18.04	18.77	17.63	19.36	20.14	18.11	18.61
K Garima	18.17	20.05	18.63	20.98	17.59	20.48	18.83	19.25
K Jyoti	16.41	20.02	18.80	18.08	20.23	19.08	18.55	18.74
K Khyati	17.21	18.50	18.77	17.40	17.88	20.59	17.82	18.31
K Pukhraj	16.52	18.23	18.88	19.70	18.06	21.37	18.17	18.70
K Pushkar	17.41	19.29	18.47	19.28	19.85	20.98	18.52	19.11
Mean	17.33	19.02	18.72	18.85	18.83	20.44	18.33	
CD (5%)	Locations = 0.20; Genotypes = 0.19; Location x Genotype = 0.50							

## GENET.14: VARIETAL EVALUATION FOR PRODUCTION OF BABY/SALAD POTATOES (SPECIALTY POTATO)

Three test varieties viz., Kufri Himsona, Kufri Khyati and Kufri Shailja and one hybrid MP/16-b were evaluated for production of specialty potatoes by using the control of the region i.e., Kufri Pukhraj, Kufri Lauvkar, Kufri Pushkar, Kufri Bahar and Kufri Badshah in central plains; Kufri Pukhraj, Kufri Ashoka, Kufri Pushkar and Kufri Jyoti in eastern plains during 60, 75 and 90 days crop durations at Bhubaneshwar, Chhindwara and Raipur centres of AICRP (P) during *Rabi* season.

Plant emergence was normal at all centres. Leaf spot and viral diseases appeared at Chhindwara and Raipur. Late blight did not appear at any of the locations.

Kufri Pukhraj was the best variety for total yield of baby tubers at Bhubaneshwar (60 days), Chhindwara (90 days) and Raipur (60 days). Kufri Khyati was the best variety for total yield of baby tubers at Raipur (75 & 90 days). Kufri Ashoka was the best variety for total of baby tubers yield at Bhubaneshwar (75 days). MP/16-b was the best hybrid for total yield of baby tubers at Bhubaneshwar (90 days) and Chhindwara (60-75 days).

Kufri Ashoka (68.78%) at Bhubaneshwar, Kufri Himsona (84.79%) at Chhindwara and MP/16-b (87.88%) at Raipur produced tubers of less than 50 gm tuber weight (baby tubers) during 60 days crop duration. Kufri Jyoti (63.71%) at Bhubaneshwar, Kufri Himsona at Chhindwara (85.74%) and at Raipur (77.99%) produced tubers of less than 50 gm tuber weight (baby tubers) during 75 days crop duration while during 90 days crop duration MP/16-b (61.83%), Kufri Himsona (77.79% & 63.04%) produced tubers of less than 50 gm tuber weight at Bhubaneshwar, Chhindwara and Raipur, respectively.

The data were pooled for 5 varieties, Kufri Himsona, Kufri Shailja, Kufri Khyati, Kufri Pukhraj and Kufri Pushkar screened over two years for suitability of specialty potatoes production at Bhubaneshwar, Chhindwara and Raipur. The percent baby tuber (10-25g, 25-50g and >50g) yield was significantly varying across locations and varieties in all crop durations. At 60 days crop, Kufri Himsona, Kufri Khyati and Kufri Pukhraj were at par and produced highest 10-25g tuber yield, Kufri Pushkar was best for 25-50g tuber percent while >50g tuber percent was the highest in Kufri Pukhraj and Kufri Pushkar. Total yield was the maximum in Kufri Pukhraj and Kufri Pushkar.

In 75 days crop duration, per cent baby tuber yield (10-25 g) was highest in Kufri Khyati while per cent baby tuber 25-50 g was highest in Kufri Pushkar and for >50g tubers Kufri Pukhraj was the best. Total yield was also highest in Kufri Pukhraj with maximum dry matter content in Kufri Khyati.

In the 90 crop duration, Kufri Himsona recorded the highest (% baby tubers 10-25 g) tubers, the % baby tuber 25-50 g were maximum in Kufri Pukhraj and Kufri Pushkar, and Kufri Pukhraj and Kufri Khyati had the highest % baby tuber >50 g. The varieties Kufri Pukhraj and Kufri Khyati recorded highest total yield and Kufri Khyati had the highest dry matter content.

**Table 369:** Experimental details

Experimental detail/Centre	BHN	CHN	RPR
Year	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD
Replication	4	4	3
Plot size (gross) m <sup>2</sup>	7.20	10.80	16.80
Spacing (cm)	60 x 20	60 x 20	60 x 20
Planting date	27.11.16	08.11.16	14.11.16
Dehauling date	60 DAP 21.01.17	08.01.17	13.01.17
	75 DAP 05.02.17	23.01.17	28.01.17
	90 DAP 17.02.17	07.02.17	13.02.17
Harvesting date	60DAP 26.01.17	28.02.17	20.01.17
	75 DAP 10.02.17	28.02.17	04.02.17
	90 DAP 25.02.17	28.02.17	20.02.17
Duration of crop (days)	60,75 & 90	60,75 & 90	60,75 & 90
NPK dose (kg/ha)	150:80:100	120:100:100	150:100:100

## BHUBANESHWAR

**Table 370:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), grade-wise baby tuber (%) & tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 60 days crop.

Hybrid/ variety	Emer- gence (%)	Seed Wt. (t/ha)	Foliage Senesce nce (%)	Baby tuber (%)			Yield of Baby tuber (t/ha)				Tuber rottage (t/ha)	Dry matter (%)
				10-25 g	25-50 g	>50 g	10-25g	25-50g	>50g	Total		
K Himsona	94.50	3.21	30.50	15.93	50.98	33.09	2.97	9.50	6.16	18.62	0.41	19.10
K Shailja	93.25	3.36	32.00	10.99	46.46	42.55	1.87	7.91	7.24	17.02	0.17	15.80
K Khyati	96.25	3.44	36.25	16.13	48.31	35.56	3.09	9.24	6.82	19.15	0.62	14.55
MP/16-b*	96.75	2.48	26.75	21.18	36.04	42.78	4.23	7.19	8.53	19.94	0.20	19.65
K Pukhraj	98.50	3.91	25.75	14.21	46.43	39.36	2.91	9.52	8.07	20.50	1.43	15.45
K Ashoka	94.50	3.50	21.00	16.12	52.85	31.04	3.20	10.50	6.17	19.87	0.13	15.33
K Pushkar	98.25	3.20	24.25	16.28	52.01	31.71	3.02	9.64	5.88	18.53	0.78	16.55
K Jyoti	96.75	2.54	26.75	17.12	51.59	31.30	2.94	8.88	5.38	17.20	0.36	15.95
SEd	2.41	0.15	2.76	0.33	0.25	0.38	0.17	0.43	0.39	0.96	0.15	0.36
CD (0.05)	NS	0.32	5.79	0.70	0.52	0.80	0.35	0.90	0.81	2.02	0.31	0.74
CV (%)	3.55	6.64	14.01	2.95	0.73	1.51	7.82	6.71	8.02	7.22	40.91	3.04

\* Primary evaluation

**Table 371:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), grade-wise baby tuber (%) & tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 75 days crop.

Hybrid/ variety	Emer- gence (%)	Seed Wt. (t/ha)	Foliage Senesce nce (%)	Baby tuber (%)			Yield of Baby tuber (t/ha)				Tuber rottage (t/ha)	Dry matter (%)
				10-25 g	25-50 g	>50 g	10-25g	25-50g	>50g	Total		
K Himsona	94.25	3.14	66.75	16.20	43.62	40.18	3.35	9.02	8.30	20.66	1.72	21.00
K Shailja	95.00	3.31	72.50	12.03	42.50	45.48	2.28	8.06	8.62	18.96	0.82	17.50
K Khyati	93.25	3.41	75.50	15.01	40.38	44.62	2.91	7.82	8.64	19.36	1.88	16.65
MP/16-b*	96.50	2.10	72.25	16.13	43.42	40.46	4.01	10.81	10.07	24.88	0.97	21.18
K Pukhraj	96.00	4.62	77.50	11.30	36.71	51.99	2.49	8.09	11.45	22.03	1.72	17.08
K Ashoka	96.75	3.50	78.00	16.52	42.16	41.32	4.15	10.58	10.37	25.10	1.70	16.40
K Pushkar	92.25	3.12	76.25	14.93	40.47	44.60	2.83	7.65	8.43	18.90	1.63	20.85
K Jyoti	96.25	2.87	80.75	17.98	45.73	36.29	3.44	8.74	6.93	19.10	1.15	18.40
SEd	2.53	0.13	2.73	0.37	0.22	0.43	0.12	0.20	0.16	0.42	0.17	0.30
CD (0.05)	NS	0.27	5.72	0.77	0.46	0.90	0.24	0.42	0.33	0.89	0.35	0.63
CV (%)	3.77	5.60	5.16	3.46	0.74	1.41	5.19	3.18	2.48	2.84	16.48	2.28

\* Primary evaluation

**Table 372:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), grade-wise baby tuber (%) & tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/ variety	Emer- gence (%)	Seed Wt. (t/ha)	Foliage Senesce nce (%)	Baby tuber (%)			Yield of Baby tuber (t/ha)				Tuber rottage (t/ha)	Dry matter (%)
				10-25 g	25-50 g	>50 g	10-25g	25-50g	>50g	Total		
K Himsona	93.00	3.17	92.50	14.10	43.72	42.18	2.70	8.37	8.07	19.14	2.04	21.45
K Shailja	98.50	3.30	97.25	12.28	42.42	45.30	2.18	7.52	8.04	17.73	0.52	18.50
K Khyati	94.25	3.59	98.50	15.80	39.94	44.27	3.04	7.68	8.51	19.22	1.68	16.90
MP/16-b*	98.25	1.75	93.75	20.23	41.60	38.17	4.57	9.38	8.61	22.55	1.08	21.35
K Pukhraj	94.50	5.25	97.00	16.25	38.06	45.70	3.39	7.93	9.52	20.84	1.70	17.43
K Ashoka	94.25	3.28	98.75	16.18	40.29	43.53	3.52	8.75	9.44	21.70	1.12	16.93
K Pushkar	94.00	3.24	97.75	15.31	37.94	46.75	2.75	6.81	8.39	17.94	1.15	22.03
K Jyoti	96.50	2.59	97.25	16.23	42.47	41.30	3.15	8.24	8.01	19.39	0.67	18.93
SEd	2.21	0.10	2.07	0.24	0.28	0.33	0.09	0.17	0.18	0.40	0.16	0.28
CD (0.05)	NS	0.20	NS	0.50	0.58	0.69	0.19	0.35	0.37	0.84	0.34	0.59
CV (%)	3.27	4.10	3.04	2.15	0.96	1.07	4.14	2.94	2.95	2.87	18.25	2.08

\* Primary evaluation

**Table 373:** Total weight loss after 75 days storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt. Loss due to sprouting (At the end of storage of 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
K Himsona	> 6 weeks	0.0	45.7	-	0.0	-	11.1
K Shailja	> 6 weeks	3.6	10.7	-	14.3	-	22.2
K Khyati	> 6 weeks	0.0	0.0	-	0.0	-	10.2
MP/16-b*	> 6 weeks	0.0	0.0	-	0.0	-	4.2
K Pukhraj	> 6 weeks	0.0	28.5	-	5.0	-	31.2
K Ashoka	> 6 weeks	0.0	0.0	-	0.0	-	4.5
K Pushkar	> 6 weeks	0.0	0.0	-	3.3	-	18.0
K Jyoti	> 6 weeks	0.0	0.0	-	5.9	-	15.9

\* Primary evaluation

**CHHINDWARA****Table 374:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), grade-wise baby tuber (%) & tuber yield (t/ha) and dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Baby tuber (%)			Yield of Baby tuber (t/ha)				Dry matter (%)
				10-25 g	25-50 g	>50 g	10-25g	25-50g	>50g	Total	
K Himsona	91.50	3.89	73.00	36.21	48.58	15.45	5.28	7.19	2.34	14.80	17.13
K Shailja	91.75	3.82	76.75	27.21	39.46	33.57	4.42	6.63	5.77	16.81	16.68
K Khyati	93.00	4.28	70.75	29.81	40.09	30.05	5.23	7.10	5.17	17.50	17.08
MP/16-b*	91.25	4.16	72.75	27.94	38.18	33.88	5.53	7.57	6.71	19.81	16.63
K Pukhraj	92.25	4.47	74.00	25.45	41.96	32.71	5.04	7.71	5.94	18.69	16.40
K Lauvkar	94.00	4.80	73.00	35.96	44.39	18.62	5.25	6.12	2.44	13.81	16.53
K Pushkar	94.00	4.65	74.00	24.94	36.84	38.21	4.86	7.00	7.15	19.00	16.58
K Bahar	91.75	4.82	72.75	22.41	44.89	32.68	3.16	6.19	4.31	13.65	14.20
K Badshah	94.00	4.35	74.75	17.44	40.98	41.56	3.10	7.12	6.99	17.20	13.40
SEd	1.04	0.12	1.62	0.86	0.79	0.97	0.36	0.55	0.45	1.25	0.29
CD (0.05)	2.17	0.25	NS	1.79	1.63	2.01	0.75	NS	0.94	2.60	0.60
CV (%)	1.59	3.88	3.12	4.43	2.67	4.45	10.93	11.25	12.33	10.54	2.54

\* Primary evaluation

**Table 375:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), grade-wise baby tuber (%) & tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Baby tuber (%)			Yield of Baby tuber (t/ha)				Dry matter (%)
				10-25 g	25-50 g	>50 g	10-25g	25-50g	>50g	Total	
K Himsona	92.50	3.77	83.25	37.36	48.38	14.25	6.38	8.26	2.40	17.04	18.05
K Shailja	92.25	3.82	83.25	24.95	41.50	33.54	5.15	8.56	6.88	20.58	17.38
K Khyati	94.25	4.21	82.50	28.55	41.61	29.83	6.75	9.83	7.02	23.59	17.70
MP/16-b*	94.50	4.14	82.75	27.21	30.18	42.60	7.33	8.13	11.45	26.90	17.40
K Pukhraj	93.50	4.21	85.25	22.00	41.34	36.65	5.41	10.14	8.95	24.49	17.20
K Lauvkar	92.75	4.86	83.00	36.43	42.16	21.40	6.20	7.17	3.60	16.97	17.63
K Pushkar	94.00	4.75	84.00	23.82	46.04	30.13	5.49	10.60	6.90	22.99	17.55
K Bahar	91.50	4.86	82.50	19.90	53.92	26.17	4.07	11.02	5.31	20.40	16.80
K Badshah	91.50	4.21	84.75	27.83	47.50	24.58	6.69	11.41	5.89	23.98	15.53
SEd	1.17	0.09	1.65	0.26	0.23	0.20	0.08	0.15	0.10	0.23	0.26
CD (0.05)	NS	0.19	NS	0.54	0.48	0.42	0.16	0.30	0.20	0.49	0.54
CV (%)	1.78	3.00	2.79	1.34	0.75	0.99	1.78	2.17	2.11	1.51	2.14

\* Primary evaluation

**Table 376:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), grade-wise baby tuber (%) & tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/ variety	Emer- gence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Baby tuber (%)			Yield of Baby tuber (t/ha)				Dry matter (%)
				10-25 g	25-50 g	>50 g	10-25g	25-50g	>50g	Total	
K Himsona	93.75	3.87	93.25	33.85	43.94	22.18	8.07	10.46	5.27	23.80	19.10
K Shailja	91.75	3.84	92.75	27.21	37.68	35.11	6.12	8.47	7.91	22.50	18.43
K Khyati	92.75	4.14	91.50	21.05	30.50	48.44	6.21	9.01	14.28	29.50	18.33
MP/16-b*	93.75	3.80	92.75	17.33	33.32	49.34	5.28	10.14	14.98	30.40	18.20
K Pukhraj	94.00	4.45	95.25	19.97	32.81	47.21	6.89	11.34	16.27	34.50	18.40
K Lauvkar	90.75	4.84	94.00	24.26	33.32	42.41	5.91	8.11	10.27	24.29	18.80
K Pushkar	93.25	4.77	94.00	16.66	30.70	52.63	5.01	9.23	15.76	30.00	18.28
K Bahar	91.50	4.89	92.50	20.46	33.06	46.42	4.88	7.88	11.39	24.15	17.30
K Badshah	91.00	4.05	93.50	20.14	32.57	47.27	5.49	8.87	12.44	26.80	16.70
SEd	0.89	0.11	1.49	1.07	0.63	0.88	0.35	0.26	0.37	0.63	0.13
CD (0.05)	1.84	0.23	NS	2.22	1.31	1.82	0.72	0.54	0.76	1.30	0.28
CV (%)	1.36	3.71	2.25	6.76	2.60	2.85	8.16	3.98	4.31	3.23	1.04

\* Primary evaluation

**Table 377:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
	Did not appear	Did not appear	Did not appear	Did not appear	Did not appear	Did not appear	Did not appear	Did not appear	Did not appear
K Himsona					3.1	1.5		4.4	2.7
K Shailja					3.3	2.0		3.6	2.5
K Khyati					3.2	1.9		3.9	2.8
MP/16-b*					1.0	1.0		1.0	1.7
K Pukhraj					4.2	2.1		4.1	3.1
K Lauvkar					3.5	2.0		2.0	2.5
K Pushkar					2.1	2.2		4.2	3.1
K Bahar					2.3	2.6		2.4	3.0
K Badshah					2.1	2.1		2.0	2.8

\* Primary evaluation

## RAIPUR

**Table 378:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), grade-wise baby tuber (%) & tuber yield (t/ha), tuber rottage (t/ha) and dry matter (%) in 60 days crop.

Hybrid/ variety	Emer- gence (%)	Seed Wt. (t/ha)	Baby tuber (%)			Yield of Baby tuber (t/ha)				Tuber rottage (t/ha)	Dry matter (%)
			10-25 g	25-50 g	>50 g	10-25g	25-50g	>50g	Total		
K Himsona	93.33	3.98	49.11	28.07	20.81	5.26	3.01	2.22	10.70	0.21	19.17
K Shailja	91.48	4.37	44.54	25.50	28.85	5.72	3.27	3.70	12.84	0.14	19.02
K Khyati	92.22	4.34	40.94	22.07	34.62	5.75	3.12	4.87	14.07	0.33	19.35
MP/16-b*	92.59	4.41	57.75	30.13	12.12	7.52	3.93	1.59	13.04	0.00	19.12
K Pukhraj	92.59	3.95	45.96	33.58	18.02	6.79	4.96	2.66	14.78	0.36	18.25
K Pushkar	91.85	4.07	43.08	28.07	25.27	6.19	4.01	3.63	14.34	0.51	18.15
K Bahar	91.48	3.85	54.55	21.28	20.07	7.28	2.84	2.67	13.33	0.55	18.24
K Badshah	91.11	3.96	45.48	27.95	23.50	5.30	3.26	2.74	11.65	0.36	19.43
SEd	1.64	0.12	1.59	2.12	1.17	0.31	0.29	0.17	0.45	0.10	0.17
CD (0.05)	NS	0.27	3.45	4.59	2.54	0.67	0.63	0.36	0.97	0.22	0.37
CV (%)	2.18	3.67	4.09	9.60	6.28	6.11	9.98	6.78	4.17	40.66	1.10

\* Primary evaluation

**Table 379:** Foliage senescence (%), grade-wise baby tuber (%) & tuber yield (t/ha), tuber rottage (t/ha) and dry matter (%) in 75 days crop.

Hybrid/ variety	Foliage Senescence (%)	Baby tuber (%)			Yield of Baby tuber (t/ha)				Tuber rottage (t/ha)	Dry matter (%)
		10-25 g	25-50 g	>50 g	10-25g	25-50g	>50g	Total		
K Himsona	28.72	47.07	30.92	21.76	7.95	5.23	3.68	16.90	0.04	20.46
K Shailja	27.21	39.86	25.05	29.32	8.45	5.32	6.22	21.22	1.23	20.12
K Khyati	11.89	34.05	22.00	40.53	9.02	5.83	10.74	26.50	0.91	20.34
MP/16-b*	22.98	42.05	21.88	35.91	9.44	4.91	8.06	22.45	0.03	20.55
K Pukhraj	18.33	26.80	18.33	48.55	5.66	3.88	10.27	21.15	1.33	19.03
K Pushkar	23.24	28.64	22.61	45.49	6.44	5.08	10.23	22.48	0.73	20.02
K Bahar	15.78	23.05	17.72	50.92	4.56	3.51	10.08	19.80	1.65	19.13
K Badshah	21.60	30.03	21.95	43.95	5.78	4.24	8.47	19.26	0.78	19.86
SEd	1.61	0.76	0.82	0.63	0.14	0.23	0.23	0.40	0.07	0.11
CD (0.05)	3.49	1.65	1.77	1.37	0.30	0.49	0.50	0.88	0.15	0.24
CV (%)	9.29	2.74	4.43	1.96	2.33	5.85	3.34	2.33	9.87	0.69

\* Primary evaluation

**Table 380:** Foliage senescence (%), grade-wise baby tuber (%) & tuber yield (t/ha), tuber rottage (t/ha) and dry matter (%) in 90 days crop.

Hybrid/ variety	Foliage Senescence (%)	Baby tuber (%)			Yield of Baby tuber (t/ha)				Tuber rottage (t/ha)	Dry matter (%)
		10-25 g	25-50 g	>50 g	10-25g	25-50g	>50g	Total		
K Himsona	97.05	33.40	29.64	33.45	7.46	6.62	7.47	22.32	0.78	20.88
K Shailja	97.38	34.49	22.24	39.05	9.35	6.03	10.59	27.12	1.15	20.57
K Khyati	90.05	22.28	16.02	53.92	7.14	5.13	17.29	32.06	2.50	21.04
MP/16-b*	87.49	38.40	16.13	35.29	10.96	4.60	10.08	28.54	2.91	20.64
K Pukhraj	83.56	26.30	21.62	46.34	6.61	5.43	11.64	25.13	1.44	20.67
K Pushkar	75.56	27.38	18.65	43.02	6.45	4.41	10.17	23.63	2.60	20.83
K Bahar	86.31	23.92	21.12	52.58	4.98	4.40	10.94	20.81	0.50	20.12
K Badshah	82.45	29.54	29.98	37.31	6.52	6.62	8.24	22.08	0.70	20.26
SEd	1.46	1.11	0.37	1.02	0.27	0.17	0.34	0.60	0.19	0.17
CD (0.05)	3.17	2.39	0.80	2.21	0.59	0.36	0.74	1.29	0.41	0.36
CV (%)	2.05	4.59	2.05	2.93	4.47	3.75	3.87	2.90	14.66	1.00

\* Primary evaluation

**Table 381:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
K Himsona	Did not appear	Did not appear	Did not appear	Did not appear	10.0	13.3	Did not appear	14.4	21.1
K Shailja					17.8	21.1		16.7	24.4
K Khyati					6.7	14.4		21.1	27.8
MP/16-b*					11.1	12.2		15.6	18.9
K Pukhraj					8.9	18.9		17.8	27.8
K Pushkar					6.7	15.6		13.3	20.0
K Bahar					11.1	20.0		14.4	20.0
K Badshah					7.8	17.8		10.0	17.8

\* Primary evaluation

**Table 382:** Total weight loss after 75 days storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt. Loss due to sprouting (At the end of storage of 75 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (75 days)		Number basis	Weight basis	
K Himsona	> 6 weeks	Nil	Nil	0	30	30.09	32.57
K Shailja	> 6 weeks	Nil	Nil	0	50	48.18	32.55
K Khyati	> 6 weeks	Nil	Nil	0	50	48.50	49.63
MP/16-b*	> 6 weeks	Nil	Nil	0	40	42.72	45.16
K Pukhraj	> 6 weeks	Nil	Nil	0	30	31.44	33.13
K Pushkar	> 6 weeks	Nil	Nil	0	50	52.42	55.24
K Bahar	> 6 weeks	Nil	Nil	0	40	42.88	44.80
K Badshah	> 6 weeks	Nil	Nil	0	20	21.78	24.24

\* Primary evaluation

**POOLED OVER THE YEAR (2015-16 & 2016-17)****Table 382.1:** Grade-wise & total yield (t/ha) and dry matter (%) under different location over the year at 60 days

Variety	BHN	CHN	RPR	Mean	BHN	CHN	RPR	Mean	BHN	CHN	RPR	Mean
	Yield 10-25g (t/ha)				Yield 25-50g (t/ha)				Yield >50g (t/ha)			
K Himsona	2.20	4.95	4.95	4.03	7.01	6.82	2.18	5.34	4.35	1.86	2.35	2.85
K Shailja	1.63	4.42	4.59	3.54	6.96	6.50	2.20	5.22	6.06	4.91	2.63	4.53
K Khyati	2.75	5.58	3.93	4.09	7.84	8.01	4.88	6.91	5.49	5.66	3.57	4.91
K Pukhraj	2.49	5.59	3.98	4.02	7.85	8.73	6.39	7.65	6.31	6.94	3.80	5.68
K Pushkar	2.68	4.85	3.49	3.68	8.83	8.14	7.70	8.22	4.65	7.43	4.65	5.57
Mean	2.35	5.08	4.19		7.70	7.64	4.67		5.37	5.36	3.40	
CD (5%)	Location = 0.17; Variety = 0.22 Location x Variety = 0.37				Location = 0.25; Variety = 0.32 Location x Variety = 0.55				Location = 0.22; Variety = 0.28 Location x Variety = 0.48			

Table contd.....

Variety	BHN	CHN	RPR	Mean	CHN	RPR	Mean
	Total Yield (t/ha)				Dry matter (%)		
K Himsona	13.55	13.62	9.74	12.31	16.59	17.94	17.26
K Shailja	14.65	15.82	9.59	13.35	16.44	17.82	17.13
K Khyati	16.08	19.25	12.91	16.08	17.00	18.33	17.66
K Pukhraj	16.66	21.25	14.69	17.53	16.50	17.83	17.17
K Pushkar	16.15	20.42	16.55	17.71	16.73	17.85	17.29
Mean	15.42	18.07	12.70		16.65	17.95	
CD (5%)	Location = 0.50; Variety = 0.64; Location x Variety = 1.12				Location = 0.12; Variety = 0.19 Location x Variety = NS		

**Table 382.2:** Grade-wise & total yield (t/ha) and dry matter (%) under different location over the year at 75 days

Variety	BHN	CHN	RPR	Mean	BHN	CHN	RPR	Mean	BHN	CHN	RPR	Mean
	Yield 10-25g (t/ha)				Yield 25-50g (t/ha)				Yield >50g (t/ha)			
K Himsona	2.40	5.80	5.49	4.56	6.47	7.68	5.81	6.65	5.83	3.03	2.86	3.91
K Shailja	1.98	5.13	5.71	4.27	7.05	8.61	4.95	6.87	7.25	6.37	5.22	6.28
K Khyati	2.99	6.75	7.94	5.89	7.60	10.01	4.74	7.45	8.02	7.47	6.40	7.29
K Pukhraj	2.78	6.31	5.51	4.86	7.65	11.00	5.08	7.91	10.02	9.41	7.45	8.96
K Pushkar	2.52	5.25	6.83	4.87	6.60	11.90	6.24	8.25	7.31	8.26	7.37	7.65
Mean	2.53	5.85	6.29		7.08	9.84	5.37		7.68	6.91	5.86	
CD (5%)	Location = 0.15; Variety = 0.19 Location x Variety = 0.34				Location = 0.21; Variety = 0.27 Location x Variety = 0.47				Location = 0.23; Variety = 0.30 Location x Variety = 0.52			

Table contd.....

Variety	BHN	CHN	RPR	Mean	CHN	RPR	Mean
	Total Yield (t/ha)				Dry matter (%)		
K Himsona	14.69	16.52	14.36	15.19	17.85	19.40	18.63
K Shailja	16.27	19.86	17.35	17.83	17.46	19.25	18.36
K Khyati	18.61	24.23	20.50	21.11	17.71	20.02	18.87
K Pukhraj	20.45	26.70	19.94	22.36	17.30	19.42	18.36
K Pushkar	16.43	25.41	20.81	20.89	17.60	19.84	18.72
Mean	17.29	22.55	18.59		17.59	19.59	
CD (5%)	Location = 0.42; Variety = 0.54; Location x Variety = 0.94				Location = 0.13; Variety = 0.21 Location x Variety = 0.29		

**Table 382.3:** Grade-wise & total yield (t/ha) and dry matter (%) under different location over the year at 90 days

Variety	BHN	CHN	RPR	Mean	BHN	CHN	RPR	Mean	BHN	CHN	RPR	Mean
	Yield 10-25g (t/ha)				Yield 25-50g (t/ha)				Yield >50g (t/ha)			
K Himsona	2.04	7.07	6.05	5.05	6.19	9.91	3.98	6.70	5.87	5.42	4.97	5.42
K Shailja	1.94	5.62	6.27	4.61	6.94	8.86	5.94	7.25	7.27	8.55	9.00	8.27
K Khyati	2.86	5.71	5.43	4.67	7.30	9.29	5.33	7.31	7.88	14.19	15.39	12.49
K Pukhraj	3.02	6.45	5.25	4.91	7.17	10.73	5.21	7.70	8.86	16.23	12.44	12.51
K Pushkar	2.47	5.01	4.55	4.01	6.22	11.12	5.10	7.48	7.54	16.99	11.49	12.01
Mean	2.47	5.97	5.51		6.77	9.98	5.11		7.48	12.28	10.66	
CD (5%)	Location = 0.17; Variety = 0.21 Location x Variety = 0.37				Location = 0.20; Variety = 0.26 Location x Variety = 0.46				Location = 0.23; Variety = 0.29 Location x Variety = 0.51			

Table contd.....

Variety	BHN	CHN	RPR	Mean	CHN	RPR	Mean
	Total Yield (t/ha)				Dry matter (%)		
K Himsona	14.11	22.41	15.56	17.36	18.74	20.53	19.63
K Shailja	16.15	23.04	22.70	20.63	18.36	20.61	19.49
K Khyati	18.03	29.26	27.89	25.06	18.54	21.22	19.88
K Pukhraj	19.04	33.31	23.98	25.44	18.14	20.95	19.55
K Pushkar	16.23	33.12	22.64	24.00	18.30	20.75	19.53
Mean	16.71	28.23	22.55		18.42	20.81	
CD (5%)	Location = 0.43; Variety = 0.55; Location x Variety = 0.96				Location = 0.19; Variety = NS Location x Variety = 0.43		



## GENET.15: STANDARDIZATION OF TPS TECHNOLOGY

### a) FOR SEEDLING TUBER PRODUCTION

Two methods of seedling tuber production viz., brick bed method and normal nursery method were compared for various traits using two TPS varieties viz., D-150 and 92-PT-27 at Patna. The results showed that plant emergence, seedling vigour and tuber uniformity was higher or at par in brick method. Grade-wise total tuber yield was at par in brick method at Jorhat, while it was lower in brick method at Patna.

**Table 383:** Experimental details

Experimental detail/Centre	JRH	PAT
Year	2016-17	2016-17
Design	RBD	RBD
Replication	3	3
Plot size (m <sup>2</sup> )	9.00	10.80
Spacing (cm)	50 x 20	50 x 20
Planting date	14.11.16	10.12.16
Dehauling date	14.02.17	08.03.17
Harvesting date	21.02.17	18.03.17
Duration of crop (days)	90	90

#### JORHAT

**Table 384:** Number of plant emerged/sqm and tuber uniformity (1-5 scale) in brick bed and normal nursery bed method

Hybrid/variety	Brick bed method			Normal nursery bed method		
	No of plant emerged/sqm	Tuber uniformity (1-5 scale)		No of plant emerged/sqm	Tuber uniformity (1-5 scale)	
		Shape	colour		Shape	colour
92-PT-27	84.67	4.00	4.00	81.67	4.00	4.00
D-150	85.00	4.00	4.00	82.67	4.00	4.00
SEd	0.88	0.00	0.00	1.00	0.00	0.00
CD (0.05)	NS	NS	NS	NS	NS	NS
CV (%)	1.27	0.11	0.11	1.49	0.11	0.11

**Table 385:** Grade-wise & total tuber yield (t/ha) in brick bed and normal nursery bed method

Hybrid/variety	Brick bed method				Normal nursery bed method			
	Grade-wise tuber yield (t/ha)				Grade-wise tuber yield (t/ha)			
	<15 g	15-25g	>25g	Total	<15 g	15-25g	>25g	Total
92-PT-27	2.41	0.65	0.39	3.44	2.43	0.33	0.70	3.47
D-150	2.78	0.65	0.34	3.77	2.76	0.60	0.44	3.79
SEd	0.09	0.08	0.05	0.06	0.04	0.08	0.03	0.11
CD (0.05)	NS	NS	NS	0.29	0.19	NS	0.15	NS
CV (%)	4.25	15.42	17.58	2.11	1.91	21.66	7.05	3.55

#### PATNA

**Table 386:** Number of plant emerged/sqm, seedling vigor (1-5 scale) and tuber uniformity (1-5 scale) in brick bed and normal nursery bed method

Hybrid/variety	Brick bed method				Normal nursery bed method			
	No of plant emerged/sqm	Seedling vigor (1-5 scale)	Tuber uniformity (1-5 scale)		No of plant emerged/sqm	Seedling vigor (1-5 scale)	Tuber uniformity (1-5 scale)	
			Shape	colour			Shape	colour
92-PT-27	89.67	3.33	3.33	3.00	89.33	3.67	3.67	3.67

D-150	92.00	3.33	4.00	4.00	86.33	3.67	3.67	3.33
SEd	0.33	0.58	0.34	0.00	2.00	0.58	0.58	0.33
CD (0.05)	1.54	NS	NS	0.02	NS	NS	NS	NS
CV (%)	0.45	21.21	11.20	0.12	2.79	19.29	19.29	11.66

**Table 387:** Grade-wise & total tuber yield (t/ha) in brick bed and normal nursery bed method

Hybrid/variety	Brick bed method				Normal nursery bed method			
	Grade-wise tuber yield (t/ha)				Grade-wise tuber yield (t/ha)			
	<15 g	15-25g	>25g	Total	<15 g	15-25g	>25g	Total
92-PT-27	1.62	4.92	8.92	15.46	1.46	5.34	11.32	18.13
D-150	1.38	4.36	8.91	14.65	1.75	5.95	10.31	18.00
SEd	0.30	1.24	1.48	0.94	0.36	0.90	1.01	0.96
CD (0.05)	NS	NS	6.84	NS	NS	NS	NS	NS
CV (%)	24.85	32.72	20.28	7.65	27.47	19.42	11.46	6.51

## B) WARE POTATO PRODUCTION USING SEEDLING TUBERS

Trial was conducted at Patna and the results showed that D-150 performed better for plant emergence (%) and seedling vigor under brick method. Grade wise total tuber yield of D-150 was at par in both brick bed method and nursery bed method but seedling vigour of 92-PT-27 was higher in brick method.

**Table 388:** Experimental details

Experimental detail/Centre	PAT
Year	2016-17
Design	RBD
Replication	3
Plot size (m <sup>2</sup> )	10.80
Spacing (cm)	50 x 10
Planting date	08.12.16
Dehauling date	07.03.17
Harvesting date	14.03.17
Duration of crop (days)	90 days

**Table 389:** Plant emergence (%), plant vigour (1-5 scale), dry matter (%) and tuber uniformity (1-5 scale) in brick bed and normal nursery bed method

Hybrid/variety	Plant emergence (%)		Plant Vigour (1-5 scale)		Dry matter (%)		Tuber uniformity (1-5 scale)			
	Brick bed	Nursery bed	Brick bed	Nursery bed	Brick bed	Nursery bed	Brick bed		Nursery bed	
							Shape	Colour	Shape	Colour
92-PT-27	92.67	89.67	3.00	3.66	15.53	17.03	3.33	4.00	3.33	4.00
D-150	93.67	89.33	4.00	3.33	17.20	17.27	3.66	3.99	3.66	3.99
SEd	1.16	2.67	0.01	0.67	0.58	0.27	0.33	0.01	0.34	0.01
CD (0.05)	NS	NS	0.03	NS	NS	NS	NS	NS	NS	NS
CV (%)	1.52	3.65	0.21	23.28	4.37	1.90	11.68	0.21	11.73	0.21

**Table 390:** Foliage senescence (%), total & marketable tuber yield (t/ha), and organoleptic test (1-5 scale) in brick bed and normal nursery bed method

Hybrid/variety	Foliage Senescence (%)		Total tuber yield (t/ha)		Mkt. tuber yield(t/ha)		Organoleptic test (1-5 scale)	
	Brick bed	Nursery bed	Brick bed	Nursery bed	Brick bed	Nursery bed	Brick bed	Nursery bed
92-PT-27	67.67	66.33	16.45	16.04	6.06	5.75	3.66	3.33
D-150	60.33	64.00	16.40	16.61	5.79	5.46	3.99	4.00
SEd	3.84	3.53	1.13	0.82	0.80	0.24	0.33	0.33

CD (0.05)	NS	NS	NS	NS	NS	NS	NS	NS
CV (%)	7.36	6.63	8.42	6.18	16.50	5.30	10.56	10.98

**Table 391:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (1-5 scale)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (1-5 scale)
	Brick bed method			Nursery bed method		
92-PT-27	Did not appear	Did not appear	2	Did not appear	Did not appear	3
D-150	Did not appear	Did not appear	1	Did not appear	Did not appear	2

### C) FOR TPS PRODUCTION

**Table 392:** Experimental details

Experimental detail/Centre	PAT
Year	2016-17
Design	RBD
Replication	3
Plot size (m <sup>2</sup> )	10.80
Spacing (cm)	50 x 10
Planting date	08.12.16
Dehauling date	07.03.17
Harvesting date	14.03.17
Duration of crop (days)	90 days

**Table 393:** Average berry weight (in gm)\*, 100 TPS weight (in gm), and germination (%) in lab in brick bed and normal nursery bed method

Hybrid/variety	Brick bed method			Nursery bed method		
	Av Berry weight (in gm)*	100 TPS weight (in gm)	Germination (%) in lab	Av Berry weight (in gm)*	100 TPS weight (in gm)	Germination (%) in lab
92-PT-27	7.67	0.52	85.80	6.33	0.69	87.33
D-150	5.67	0.43	86.67	5.00	0.67	86.73
SEd	0.58	0.05	0.19	0.67	0.02	1.70
CD (0.05)	NS	NS	0.89	NS	NS	NS
CV (%)	10.61	12.62	0.27	14.41	3.11	2.39

\* total berries/No of berries produced per plant

## GENET.16: ON-FARM TRIAL WITH SPECIALTY POTATO HYBRID

One specialty potato hybrid, MS/08-1565 with controls viz., Kufri Lalima, Kufri Sindhuri and Kufri Lalit was evaluated at 75 and 90 days crop durations at 8 AICRP centres *i.e.* Hisar, Jalandhar, Kalyani, Kanpur, Modipuram, Pantnagar, Patna and Raipur during *rabi* season in the plains.

Plant emergence was normal at all the locations in hybrid and controls except at Raipur for MS/08-1565 (74.44%). Late blight disease did not appear at Hisar, Patna and Raipur centre. For late blight incidence, the hybrid and controls had almost similar incidence ranging from 4.0-7.0% and 7.8-9.7% at 75 and 90 days trials, respectively at Kalyani, Kanpur and Pantnagar. Leaf spot disease appeared at Kalyani (4.7-9.00%), Kanpur (4.0-10.0) and Raipur (7.0-17.9%). Viral diseases appeared at Hisar (0.0-2.0%), Kanpur (4.0-8.0%), Patna (2.0-4.0%), Raipur (9.8-21.85) and Kalyani (5.8-11.20%).

For both total and marketable tuber yields Kufri Lalit was the best control at all locations except K. Lalima at Modipuram, Kanpur, Hisar and Pantnagar during 75 and 90 days crop durations. The hybrid, MS/08-1565 yielded significantly higher for both total and marketable tuber yields than the best control during 75 and 90 days crop duration at Kanpur, Modipuram, Pantnagar and Patna during both 75 and 90 days crop durations. In dry matter content (%) the hybrid, MS/08-1565 was at par to the controls.

The data of specialty potato hybrid, MS/08-1565 along with controls viz., Kufri Lalima, Kufri Sindhuri and Kufri Lalit evaluated at 75 and 90 days crop durations at 7 AICRP centres *i.e.* Hissar, Kalyani, Kanpur, Modipuram, Pantnagar, Patna and Raipur during *rabi* season in the plains was pooled.

The plant emergence was normal for all hybrid and controls. At both 75 and 90 days crop durations, ANOVA showed non-significant differences among genotypes for all the studied traits. The hybrid as well as all control varieties were statistically at par for both total and marketable tuber yields as well as dry matter content except.

**Table 394:** Experimental details

Experimental detail/Centre	HIS	JAL	KAL	KAN	MDP	PNT	PAT	RPR
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD	RBD	RBD	RBD
Plot size (gross) m <sup>2</sup>	96.00	48.00	9.00	96.00	28.80	96.00	48.60	96.00
Spacing (cm)	60 x 20	60 x 20	60 x 20	60 x 20	60 x 20	60 x 20	60 x 20	60 x 20
Planting date	22.10.16	14.10.16	02.12.16	30-31.10.16	31.10.16	22.10.16	17.11.16	13.11.16
Dehauling date 75 DAP	08.01.17	28.12.16	17.02.17	15-16.01.17	14.01.17	07.01.17	30.01.17	28.01.17
90 DAP	23.02.17	20.01.17	04.03.17	30-31.01.17	29.01.17	22.01.17	15.02.17	12.02.17
Harvesting date 75 DAP	23.01.17	12.01.17	27.02.17	25-26.02.17	27.02.17	18.01.17	07.02.17	04.02.17
90 DAP	23.02.17	07.02.17	14.03.17	27-28.02.17	27.02.17	02.02.17	25.02.17	19.02.17
Duration of crop (days)	75 & 90	75 & 90	75 & 90	75 & 90	75 & 90	75 & 90	75 & 90	75 & 90

### HISAR

**Table 395:** Plant emergence (%), seed wt. (t/ha), total & marketable tuber yield (t/ha) and dry matter (%) 75 & 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Mkt yield (t/ha)	Dry matter (%)	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Mkt yield (t/ha)	Dry matter (%)
	75 days					90 days				
MS/08-1565	96.20	5.74	25.92	22.22	16.50	97.50	5.22	34.65	30.22	17.30

K Lalima	95.30	5.93	31.67	27.86	15.20	96.50	5.56	34.83	30.11	16.40
K Sindhuri	96.40	5.15	21.05	18.03	17.20	94.50	5.33	22.63	19.27	19.40
K Lalit	94.20	5.36	30.06	25.86	17.10	98.40	5.14	34.73	30.91	18.20

**Table 396:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
MS/08-1565	Did not appear	Did not appear	Did not appear	Did not appear	Did not appear	0.5
K Lalima						0.0
K Sindhuri						2.0
K Lalit						1.5

## JALANDHAR

**Table 397:** Plant emergence (%), seed wt. (t/ha) and total & marketable tuber yield (t/ha) 75 & 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Mkt yield (t/ha)	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence	Total yield (t/ha)	Mkt yield (t/ha)
	75 days				90 days				
MS/08-1565	96.00	5.41	27.08	25.85	97.00	5.47	5.00	41.68	39.29
K Sindhuri	93.00	4.58	27.35	24.92	91.00	4.56	0.00	39.12	36.98
K Lalit	90.00	5.57	27.98	25.71	92.00	5.66	0.00	42.43	40.21

## KALYANI

**Table 398:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	% Dry matter
MS/08-1565	100.00	2.00	40.50	21.44	20.70	16.30
K Lalima	96.00	2.44	42.00	21.89	21.13	18.80
K Sindhuri	90.00	1.63	38.50	20.00	20.55	20.20
K Lalit	96.00	2.00	41.20	22.78	22.06	17.50

**Table 399:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	% Dry matter
MS/08-1565	100.00	1.83	40.50	27.33	26.32	16.30
K Lalima	96.00	2.36	42.00	28.77	20.70	18.80
K Sindhuri	90.00	1.44	38.50	28.22	19.50	20.20
K Lalit	96.00	2.23	41.20	29.11	21.22	17.50

**Table 400:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
MS/08-1565	6.0	4.7	7.5	8.5	6.0	9.4
K Lalima	DNA	6.5	6.5	7.8	8.3	8.7
K Sindhuri	5.0	5.0	8.0	8.9	7.6	11.2
K Lalit	6.5	7.0	5.8	9.7	9.0	8.8

DNA = Did not appear

## KANPUR

**Table 401:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	% Dry matter
MS/08-1565	90.05	3.67	42.00	46.16	35.56	15.00
K Lalima	81.20	3.00	48.00	30.32	20.94	14.60
K Sindhuri	93.80	2.70	37.00	32.20	26.15	16.80
K Lalit	83.53	2.89	40.25	29.91	22.19	13.40

**Table 402:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	% Dry matter
MS/08-1565	91.50	3.64	60.00	52.10	39.60	2.29	14.90
K Lalima	81.60	3.12	65.00	36.47	25.01	2.61	14.80
K Sindhuri	96.00	2.65	55.00	39.08	29.18	2.08	16.50
K Lalit	83.20	2.91	56.00	33.34	22.92	2.92	13.50

**Table 403:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
MS/08-1565	6.0	4.0	6.0	8.0	10.0	7.0
K Lalima	5.0	6.5	5.0	7.0	8.0	6.0
K Sindhuri	4.0	5.0	4.0	6.0	5.0	4.0
K Lalit	7.0	8.0	6.0	9.0	10.0	8.0

## MODIPURAM

**Table 404:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	% Dry matter
MS/08-1565	96.67	7.12	3.00	35.15	29.99	15.83
K Lalima	97.50	7.41	2.50	32.99	29.24	17.29
K Sindhuri	98.75	5.93	2.50	28.43	22.66	16.39
K Lalit	96.25	6.91	2.50	32.43	28.32	14.92

**Table 405:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	% Dry matter
MS/08-1565	98.33	6.03	3.50	47.75	40.64	18.00
K Lalima	97.08	5.73	3.00	43.68	39.97	18.58
K Sindhuri	98.33	6.35	3.00	41.70	34.50	18.58
K Lalit	97.50	5.95	3.50	45.52	40.80	16.57

**Table 406:** Total weight loss after 3 months storage at ambient temperature

Hybrid/variety	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 75 days)	% Loss due to rottage Weight basis	Total wt. Losses (%)
		At 6 weeks	End of storage ( 75days)			
MS/08-1565	> 6 weeks	20.19	20.19	0.03	2.00	11.23
K Lalima	>6 weeks	0.00	0.00	0.00	2.67	9.58
K Sindhuri	> 6 weeks	0.00	0.00	0.00	0.00	12.30
K Lalit	> 6 weeks	7.48	12.08	0.02	4.34	11.41

**PANTNAGAR****Table 407:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	% Dry matter
MS/08-1565	97.00	3.60	77.00	24.44	24.17	0.05	17.60
K Lalima	97.00	3.58	75.67	23.43	23.13	0.05	16.53
K Sindhuri	96.67	3.65	78.33	23.82	23.50	0.10	16.87
K Lalit	97.00	3.56	77.00	23.43	23.14	0.07	16.67

**Table 408:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	% Dry matter
MS/08-1565	97.33	3.64	97.00	25.03	24.75	0.06	18.57
K Lalima	96.67	3.64	97.00	27.62	23.92	0.06	18.23
K Sindhuri	97.00	3.58	97.00	24.40	24.16	0.06	17.37
K Lalit	96.67	3.59	97.00	24.03	23.80	0.09	17.60

**Table 409:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
MS/08-1565	4	0	0	4	0	0
K Lalima	3	0	0	5	0	0
K Sindhuri	4	0	0	4	0	0
K Lalit	5	0	0	5	0	0

**PATNA****Table 410:** Plant emergence (%), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	% Dry matter
MS/08-1565	85.00	73.00	39.59	34.84	18.90
K Lalima	85.00	72.67	28.80	24.52	17.90
K Sindhuri	86.00	55.00	31.83	27.25	17.23
K Lalit	86.33	68.67	32.88	29.60	18.50

**Table 411:** Plant emergence (%), foliage senescence (%), total & marketable tuber yield (t/ha) and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	% Dry matter
MS/08-1565	94.33	81.33	46.82	36.82	20.17
K Lalima	94.00	78.67	33.26	29.51	18.90
K Sindhuri	94.00	65.00	35.61	30.32	18.00
K Lalit	93.00	74.67	39.60	34.84	19.77

**Table 412:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
MS/08-1565	Did not appear	Did not appear	2	Did not appear	Did not appear	3
K Lalima			2			3
K Sindhuri			3			4
K Lalit			3			3

**Table 413:** Total weight loss after 3 months storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90 days)		Number basis	Weight basis	
MS/08-1565	> 6 weeks	0.00	0.00	0.00	49.29	45.06	52.57
K Lalima	> 6 weeks	0.00	0.00	0.00	45.82	50.54	57.17
K Sindhuri	> 6 weeks	0.00	0.00	0.00	45.47	47.28	54.86
K Lalit	< 6 weeks	0.94	0.00	0.00	42.37	45.22	50.82

## RAIPUR

**Table 414:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	% Dry matter
MS/08-1565	74.44	3.82	2.51	13.64	9.66	0.27	19.29
K Lalima	89.64	3.92	3.32	17.22	12.35	0.45	18.72
K Sindhuri	87.74	3.95	3.86	13.60	9.92	0.42	18.04
K Lalit	89.01	3.88	4.13	18.44	11.70	0.50	19.12

**Table 415:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	% Dry matter
MS/08-1565	74.44	3.82	75.24	16.65	11.61	0.24	20.46
K Lalima	89.64	3.92	65.93	19.48	13.64	0.99	20.10
K Sindhuri	87.74	3.95	68.20	17.79	12.28	0.57	18.19
K Lalit	89.01	3.88	81.53	20.28	14.94	0.95	20.23



**Table 416:** Disease reaction

Hybrids	Late blight (%)	Leaf spot disease (%)	Viral disease (%)	Late blight (%)	Leaf spot disease (%)	Viral disease (%)
	75 days			90 days		
MS/08-1565	0	12.61	16.53	0	17.37	20.45
K Lalima	0	8.96	10.92	0	12.04	14.57
K Sindhuri	0	7.00	9.80	0	10.64	13.73
K Lalit	0	14.85	17.09	0	17.93	21.85

**Table 417:** Total weight loss after 75 days storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt. Loss due to sprouting (At the end of storage of 75 days)	% Loss due to rotting		Total wt. Losses (%)
		At 6 weeks	End of storage ( 75 days)		Number basis	Weight basis	
MS/08-1565	>6 weeks	Nil	Nil	0	50.0	51.0	52.5
K Lalima	>6 weeks	Nil	Nil	0	50.0	42.0	43.1
K Sindhuri	>6 weeks	Nil	Nil	0	40.0	39.3	40.9
K Lalit	>6 weeks	Nil	Nil	0	60.0	54.1	55.4

**POOLED OVER THE YEAR (2016-17)****Table 417.1:** On-farm performance at different location (HIS, KAL, KAN, MDP, PNT, PAT & RPR) over the year at 75 & 90 days

Treatment	Emergence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Dry matter (%)	Emergence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Dry matter (%)
	75 days				90 days			
MS/08-1565	91.34	29.48	25.31	17.06	93.35	35.76	29.99	17.96
K Lalima	91.66	26.62	22.74	17.01	93.07	32.02	26.12	17.97
K Sindhuri	92.77	24.42	21.15	17.53	93.94	29.92	24.17	18.32
K Lalit	91.76	27.13	23.27	16.74	93.40	32.37	27.06	17.62
SEd	2.21	2.05	1.89	0.58	2.38	2.30	1.93	0.64
CD (0.05)	NS	NS	NS	NS	NS	NS	4.08	NS
CV (%)	4.51	14.28	15.26	6.30	4.76	13.26	13.43	6.68

## GENET.17: EVALUATION OF WATER STRESS TOLERANT HYBRID (1<sup>ST</sup> YEAR).

Two water stress tolerant hybrids WS/05-146 and CP-4175 were evaluated at seven different locations viz. Bhubaneswar, Deesa, Faizabad, Gwalior, Hisar, Modipuram and Raipur for their suitability to water deficit conditions.

**Table 418:** Experimental details

Experimental detail/Centre	BHN	DES	FZB	GWL	HIS	MDP	RPR
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Design	SPT	SPT	SPT	SPT	SPT	SPT	SPT
Replication	4	4	4	4	3	4	3
Net plot size (m <sup>2</sup> )	7.20	6.00	9.00	16.80	9.00	10.80	9.00
Spacing (cm)	60x20	50 X 20	60 X 20	60 X 20	60 X 20	60 X 20	60 X 20
Date of planting	17.11.16	16.11.16	19.11.16	22.10.16	22.10.16	28.10.16	14.11.16
Date of dehauling 75 DAP	27.01.17		04.02.17	17.01.17	07.01.17		29.01.17
90 DAP	09.02.17	25.02.17	19.02.17	02.02.17	22.01.17	02.02.17	13.02.17
Date of harvesting 75 DAP	02.02.17		15.02.17	23.01.17	02.02.17		04.02.17
90 DAP	15.02.17	25.02.17	26.02.17	08.02.17	15.02.17	18.02.17	20.02.17
Variety	V1	WS/05-146	WS/05-146	WS/05-146	K Jyoti	WS/05-146	K Pukhraj
	V2	K Jyoti	CP-4175	CP-4175	WS/05-146	K Bahar	WS/05-146
	V3		K Sindhuri	K Sindhuri			K Pukhraj
	V4		K Pukhraj				
	V5		K Jyoti				
	V6		K Badshah				
	V7		K Khyati				
Duration of crop (days)	75 & 90	90	75 & 90	75 & 90	90	90	90

### Treatments : a). Main-plot treatments : Irrigation levels – Four

**Treatment A:** Gwalior, Hisar, Modipuram

**Treatment B:** Bhubaneswar, Deesa, Faizabad, and Raipur

- A
- l<sub>1</sub> : 2.5 IW : CPE ratio (6, adequate irrigations)
  - l<sub>2</sub> : 2.0 IW : CPE ratio (5, sub-optimal irrigations)
  - l<sub>3</sub> : 1.5 IW : CPE ratio (4, irrigations at critical stages viz. SF, TI, ETES & LTES)
  - l<sub>4</sub> : l<sub>3</sub> + paddy straw mulch @ 5 t/ha at planting

**OR**

- B
- l<sub>1</sub> : Irrigation at 20 mm CPE (6, adequate irrigations)
  - l<sub>2</sub> : Irrigation at 25 mm CPE (5, sub-optimal irrigations)
  - l<sub>3</sub> : Irrigation at 30 mm CPE (4, irrigations at critical stages viz. SF, TI, ETES & LTES)
  - l<sub>4</sub> : l<sub>3</sub> + paddy straw mulch @ 5 t/ha at planting

**Note :** Depth of irrigation = 50 mm. The first irrigation at 7-10 days after planting should be given to all the plots, thereafter, irrigation treatments will be started.

### b). Sub-plot treatments: Potato varieties

#### BHUBANESHWAR

Irrigations (l<sub>1</sub>) given at 20 mm CPE (6 Nos.) produced significantly higher total yield (18.05 & 19.16 t/ha) at 75 and 90 days, respectively in comparison to other irrigation levels, but, it was also found statistically at par with the produce of 5 irrigations (l<sub>2</sub>) at 25 mm CPE (17.23 & 17.75 t/ha, respectively). Similar trend was also noticed in case of 25-75 and > 75 g size tuber yields and numbers at 90 days, while at 75 days, the yield and tuber

numbers of 25-75 g size. The total tubers were significantly higher (5,21,875 tubers/ha) at 90 days when 5 irrigations (I<sub>2</sub>) given at 25 mm CPE. However, the number of tubers did not differ significantly at 75 days.

Advance hybrid WS/05-146 (V<sub>1</sub>) produced significantly higher total yield (17.71 & 17.56 t/ha) at 75 and 90 days, respectively against Kufri Jyoti (V<sub>2</sub>), it was also found statistically superior over control (V<sub>2</sub>). Under targeted environment, four irrigations (I<sub>3</sub>) excluding palewa, advance hybrid (V<sub>1</sub>) produced significantly higher yields (17.38 & 15.66 t/ha) and saved 28% irrigation water in comparison to Kufri Jyoti (V<sub>2</sub>) which gave 14.38 and 13.31 t/ha at 75 and 90 days, respectively. Similar trend was also noticed in case of total number of tubers at both the crop duration.

**Table 419:** Plant emergence (%), plant height (cm), no of shoots/plant, grade-wise yield (t/ha) and no of tubers ('000/ha) in 75 days crop

Treatments	% Emergence			Plant height (cm)		
	V1	V2	Mean	V1	V2	Mean
I1	90.00	93.50	91.75	33.07	32.34	32.70
I2	92.50	89.25	90.88	27.40	28.44	27.92
I3	92.75	89.25	91.00	27.03	25.78	26.40
I4	88.25	95.50	91.88	29.24	30.53	29.89
Mean	90.88	91.88		29.19	29.27	
SEd (Irrigation levels)	3.27			0.43		
CD (0.05) (Irrigation levels)	NS			0.99		
SEd (Varieties)	1.91			0.52		
CD (0.05) (Varieties)	NS			NS		
SEd Irrigation levels at the same level of varieties	3.82			1.04		
CD (0.05) Irrigation levels at the same level of varieties	NS			NS		
SEd varieties at the same level of Irrigation levels	4.24			0.85		
CD (0.05) varieties at the same level of Irrigation levels	NS			NS		
Treatments	No. of shoots/plant			Yield of tubers 0-25g (t/ha)		
	V1	V2	Mean	V1	V2	Mean
I1	7.65	5.20	6.43	4.70	3.28	3.99
I2	8.38	6.30	7.34	5.17	3.87	4.52
I3	8.05	5.25	6.65	6.77	3.71	5.24
I4	6.80	5.45	6.13	5.35	3.48	4.42
Mean	7.72	5.55		5.50	3.58	
SEd (Irrigation levels)	0.32			0.34		
CD (0.05) (Irrigation levels)	0.72			0.79		
SEd (Varieties)	0.35			0.19		
CD (0.05) (Varieties)	0.76			0.41		
SEd Irrigation levels at the same level of varieties	0.69			0.38		
CD (0.05) Irrigation levels at the same level of varieties	NS			0.85		
SEd varieties at the same level of Irrigation levels	0.58			0.44		
CD (0.05) varieties at the same level of Irrigation levels	NS			0.98		
Treatments	Yield of tubers 25-75g (t/ha)			Yield of tubers >75g (t/ha)		
	V1	V2	Mean	V1	V2	Mean
I1	8.49	10.41	9.45	4.35	4.88	4.61
I2	8.88	7.27	8.07	4.04	5.25	4.65
I3	5.73	5.96	5.84	4.89	4.71	4.80
I4	6.74	7.54	7.14	5.75	4.78	5.27
Mean	7.46	7.79		4.76	4.91	
SEd (Irrigation levels)	0.49			0.22		
CD (0.05) (Irrigation levels)	1.12			NS		
SEd (Varieties)	0.34			0.21		
CD (0.05) (Varieties)	NS			NS		
SEd Irrigation levels at the same level of varieties	0.68			0.42		
CD (0.05) Irrigation levels at the same level of varieties	1.53			0.94		
SEd varieties at the same level of Irrigation levels	0.68			0.37		
CD (0.05) varieties at the same level of Irrigation levels	1.54			0.83		
Treatments	Total yield (t/ha)			No of tubers 0-25g (no/ha)		

	V1	V2	Mean	V1	V2	Mean
I1	17.53	18.56	18.05	390278	277083	333681
I2	18.09	16.38	17.23	436806	332986	384896
I3	17.38	14.38	15.88	560417	314236	437327
I4	17.84	15.80	16.82	443750	298264	371007
Mean	17.71	16.28		457813	305642	
SEd (Irrigation levels)	0.45			31284		
CD (0.05) (Irrigation levels)	1.04			NS		
SEd (Varieties)	0.32			14458		
CD (0.05) (Varieties)	0.71			31850		
SEd Irrigation levels at the same level of varieties	0.64			28916		
CD (0.05) Irrigation levels at the same level of varieties	1.44			65545		
SEd varieties at the same level of Irrigation levels	0.64			37373		
CD (0.05) varieties at the same level of Irrigation levels	1.44			84717		
Treatments	No of tubers 25-75g (no/ha)			No of tubers >75g (no/ha)		
	V1	V2	Mean	V1	V2	Mean
I1	228125	273959	251042	52430	49653	51041
I2	242361	209028	225695	50348	54861	52604
I3	158334	161459	159896	59375	51042	55208
I4	184375	200695	192535	60070	58333	59201
Mean	203299	211285		55556	53472	
SEd (Irrigation levels)	13780			1978		
CD (0.05) (Irrigation levels)	31613			4537		
SEd (Varieties)	8116			2320		
CD (0.05) (Varieties)	NS			NS		
SEd Irrigation levels at the same level of varieties	16231			4639		
CD (0.05) Irrigation levels at the same level of varieties	36629			NS		
SEd varieties at the same level of Irrigation levels	17934			3830		
CD (0.05) varieties at the same level of Irrigation levels	40472			NS		
Treatments	Total no of tubers (no/ha)					
	V1	V2	Mean			
I1	670834	600695	635764			
I2	729514	596875	663195			
I3	778125	526736	652430			
I4	688195	557292	622743			
Mean	716667	570399				
SEd (Irrigation levels)	23269					
CD (0.05) (Irrigation levels)	NS					
SEd (Varieties)	13337					
CD (0.05) (Varieties)	29381					
SEd Irrigation levels at the same level of varieties	26674					
CD (0.05) Irrigation levels at the same level of varieties	60228					
SEd varieties at the same level of Irrigation levels	29954					
CD (0.05) varieties at the same level of Irrigation levels	67633					

**Table 420:** Plant emergence (%), plant height (cm), no of shoots/plant, grade-wise yield (t/ha) and no of tubers ('000/ha) in 90 days crop

Treatments	% Emergence			Plant height (cm)		
	V1	V2	Mean	V1	V2	Mean
I1	90.50	93.25	91.88	32.71	32.25	32.48
I2	91.75	91.00	91.38	27.14	28.27	27.70
I3	91.75	89.50	90.63	28.47	25.84	27.15
I4	88.75	95.00	91.88	29.22	30.32	29.77
Mean	90.69	92.19		29.38	29.17	
SEd (Irrigation levels)	1.26			0.54		
CD (0.05) (Irrigation levels)	NS			1.24		
SEd (Varieties)	1.27			0.33		
CD (0.05) (Varieties)	NS			NS		
SEd Irrigation levels at the same level of varieties	2.54			0.65		

CD (0.05) Irrigation levels at the same level of varieties	NS			1.47		
SEd varieties at the same level of Irrigation levels	2.19			0.71		
CD (0.05) varieties at the same level of Irrigation levels	NS			1.60		
Treatments	No. of shoots/plant			Yield of tubers 0-25g (t/ha)		
	V1	V2	Mean	V1	V2	Mean
I1	7.90	5.38	6.64	1.74	1.71	1.72
I2	8.48	6.55	7.51	2.30	1.64	1.97
I3	7.83	5.35	6.59	1.54	1.60	1.57
I4	6.73	5.78	6.25	1.72	1.32	1.52
Mean	7.73	5.76		1.82	1.57	
SEd (Irrigation levels)	0.25			0.30		
CD (0.05) (Irrigation levels)	0.57			NS		
SEd (Varieties)	0.23			0.15		
CD (0.05) (Varieties)	0.50			NS		
SEd Irrigation levels at the same level of varieties	0.45			0.29		
CD (0.05) Irrigation levels at the same level of varieties	NS			NS		
SEd varieties at the same level of Irrigation levels	0.41			0.37		
CD (0.05) varieties at the same level of Irrigation levels	NS			NS		
Treatments	Yield of tubers 25-75g (t/ha)			Yield of tubers >75g (t/ha)		
	V1	V2	Mean	V1	V2	Mean
I1	10.37	11.25	10.81	7.05	6.21	6.63
I2	10.07	9.77	9.92	6.28	5.43	5.86
I3	9.84	6.89	8.36	4.30	4.82	4.56
I4	10.53	10.46	10.49	4.54	3.24	3.89
Mean	10.20	9.59		5.54	4.92	
SEd (Irrigation levels)	0.19			0.58		
CD (0.05) (Irrigation levels)	0.45			1.32		
SEd (Varieties)	0.21			0.22		
CD (0.05) (Varieties)	0.46			0.48		
SEd Irrigation levels at the same level of varieties	0.42			0.44		
CD (0.05) Irrigation levels at the same level of varieties	0.93			NS		
SEd varieties at the same level of Irrigation levels	0.35			0.65		
CD (0.05) varieties at the same level of Irrigation levels	0.79			NS		
Treatments	Total yield (t/ha)			No of tubers 0-25g (no/ha)		
	V1	V2	Mean	V1	V2	Mean
I1	19.15	19.17	19.16	152778	148611	150695
I2	18.65	16.85	17.75	199306	146875	173090
I3	15.66	13.31	14.49	140972	145139	143056
I4	16.79	15.01	15.90	151736	117708	134722
Mean	17.56	16.08		161198	139583	
SEd (Irrigation levels)	0.71			22184		
CD (0.05) (Irrigation levels)	1.63			NS		
SEd (Varieties)	0.30			11868		
CD (0.05) (Varieties)	0.65			NS		
SEd Irrigation levels at the same level of varieties	0.59			23736		
CD (0.05) Irrigation levels at the same level of varieties	NS			NS		
SEd varieties at the same level of Irrigation levels	0.83			27818		
CD (0.05) varieties at the same level of Irrigation levels	NS			NS		
Treatments	No of tubers 25-75g (no/ha)			No of tubers >75g (no/ha)		
	V1	V2	Mean	V1	V2	Mean
I1	296875	297222	297049	78820	67014	72917
I2	288542	276042	282292	67709	65278	66493
I3	268056	196528	232292	52430	53472	52951
I4	291320	298264	294792	55208	42014	48611
Mean	286198	267014		63542	56945	
SEd (Irrigation levels)	8469			5474		
CD (0.05) (Irrigation levels)	19428			12558		
SEd (Varieties)	5568			3213		
CD (0.05) (Varieties)	12266			NS		
SEd Irrigation levels at the same level of varieties	11136			6426		

CD (0.05) Irrigation levels at the same level of varieties	25076			NS
SEd varieties at the same level of Irrigation levels	11564			7114
CD (0.05) varieties at the same level of Irrigation levels	26040			NS
Treatments	Total no of tubers (no/ha)			
	V1	V2	Mean	
I1	528472	512847	520660	
I2	555556	488195	521875	
I3	461458	395139	428299	
I4	498264	457986	478125	
Mean	510937	463542		
SEd (Irrigation levels)	21996			
CD (0.05) (Irrigation levels)	50459			
SEd (Varieties)	13496			
CD (0.05) (Varieties)	29732			
SEd Irrigation levels at the same level of varieties	26993			
CD (0.05) Irrigation levels at the same level of varieties	NS			
SEd varieties at the same level of Irrigation levels	29123			
CD (0.05) varieties at the same level of Irrigation levels	NS			

## DEESA

Irrigations (I<sub>1</sub>) given at 20 mm CPE (6 Nos.) produced significantly higher total yield (20.41 t/ha) as compared to other irrigation levels, and it was also found statistically at par with the produce of 5 irrigations (I<sub>2</sub>) applied at 25 mm CPE (18.48 t/ha) and four irrigations (I<sub>4</sub>) with mulching (17.71 t/ha). Similar trend was also noticed in case of 25-75 & >75 g size yields. However, the effect of irrigation levels was non significant on total as well as 0-25 and > 75 g size tuber numbers, except 25-75 g size tuber numbers.

The *var.* Kufri Khyati (V<sub>7</sub>) produced significantly maximum total yield followed by Kufri Pukhraj (V<sub>4</sub>) *i.e.* 22.85 & 22.70 t/ha, respectively than other varieties. The similar trend was also noticed in case of tuber yields and numbers of marketable size (25-75 and >75 g) as well as total tuber numbers. However, the advance hybrid WS/05-146 (V<sub>1</sub>) produced significantly less tuber yield and numbers (10.67 t/ha and 2,01,945 tubers/ha, respectively) than other varieties.

**Table 421:** Plant emergence (%), plant height (cm), no of shoots/plant, grade-wise yield (t/ha) and no of tubers ('000/ha) in 90 days crop

Treatments	% Emergence							
	V1	V2	V3	V4	V5	V6	V7	Mean
I1	81.66	80.00	82.22	84.45	92.22	90.00	86.67	85.32
I2	81.67	89.17	85.55	85.00	83.33	88.89	90.00	86.23
I3	80.56	88.33	82.22	87.78	90.00	93.33	95.56	88.25
I4	84.44	85.00	83.89	85.00	91.11	91.67	90.55	87.38
Mean	82.08	85.63	83.47	85.56	89.17	90.97	90.69	
SEd (Irrigation levels)	2.51							
CD (0.05) (Irrigation levels)	NS							
SEd (Varieties)	2.46							
CD (0.05) (Varieties)	4.96							
SEd Irrigation levels at the same level of varieties	4.92							
CD (0.05) Irrigation levels at the same level of varieties	NS							
SEd varieties at the same level of Irrigation levels	5.20							
CD (0.05) varieties at the same level of Irrigation levels	NS							
Treatments	Plant height (cm)							
	V1	V2	V3	V4	V5	V6	V7	Mean
I1	36.00	39.58	34.30	50.30	37.13	50.38	43.67	41.62
I2	36.13	37.30	32.47	48.07	34.10	48.47	41.48	39.72

I3	30.25	32.40	29.57	41.40	31.50	42.70	37.47	35.04
I4	33.37	36.40	31.70	45.35	33.50	47.63	40.60	38.36
Mean	33.94	36.42	32.01	46.28	34.06	47.30	40.80	
SEd (Irrigation levels)	1.13							
CD (0.05) (Irrigation levels)	2.82							
SEd (Varieties)	1.03							
CD (0.05) (Varieties)	2.07							
SEd Irrigation levels at the same level of varieties	2.05							
CD (0.05) Irrigation levels at the same level of varieties	NS							
SEd varieties at the same level of Irrigation levels	2.21							
CD (0.05) varieties at the same level of Irrigation levels	NS							
Treatments	No of shoots/plant							
	V1	V2	V3	V4	V5	V6	V7	Mean
I1	3.00	3.67	3.33	3.00	2.67	4.00	2.67	3.19
I2	2.33	3.33	3.33	2.33	3.00	4.00	3.33	3.10
I3	2.33	4.33	3.00	2.67	2.67	4.00	2.67	3.10
I4	2.00	3.33	2.33	3.00	3.33	3.67	2.67	2.91
Mean	2.42	3.67	3.00	2.75	2.92	3.92	2.83	
SEd (Irrigation levels)	0.27							
CD (0.05) (Irrigation levels)	NS							
SEd (Varieties)	0.32							
CD (0.05) (Varieties)	0.65							
SEd Irrigation levels at the same level of varieties	0.64							
CD (0.05) Irrigation levels at the same level of varieties	NS							
SEd varieties at the same level of Irrigation levels	0.65							
CD (0.05) varieties at the same level of Irrigation levels	NS							
Treatments	Yield of tubers 0-25g (t/ha)							
	V1	V2	V3	V4	V5	V6	V7	Mean
I1	1.50	0.94	1.59	1.08	1.21	0.89	1.42	1.23
I2	1.18	0.60	2.02	1.58	1.31	1.08	1.16	1.28
I3	1.37	0.78	1.91	1.37	1.17	1.15	1.08	1.26
I4	1.24	1.31	1.59	1.66	1.17	0.67	2.01	1.38
Mean	1.32	0.91	1.78	1.43	1.22	0.95	1.42	
SEd (Irrigation levels)	0.05							
CD (0.05) (Irrigation levels)	0.05							
SEd (Varieties)	0.17							
CD (0.05) (Varieties)	0.17							
SEd Irrigation levels at the same level of varieties	0.34							
CD (0.05) Irrigation levels at the same level of varieties	0.34							
SEd varieties at the same level of Irrigation levels	0.32							
CD (0.05) varieties at the same level of Irrigation levels	0.32							
Treatments	Yield of tubers 25-75g (t/ha)							
	V1	V2	V3	V4	V5	V6	V7	Mean
I1	6.30	7.39	10.01	9.35	11.22	8.98	11.96	9.32
I2	6.18	5.87	9.49	8.95	11.26	6.87	9.88	8.36
I3	5.05	4.14	7.55	7.82	8.83	7.62	9.08	7.16
I4	7.25	5.63	8.40	10.17	9.10	5.05	9.17	7.82
Mean	6.19	5.76	8.86	9.07	10.10	7.13	10.02	
SEd (Irrigation levels)	0.56							

CD (0.05) (Irrigation levels)	1.40							
SEd (Varieties)	0.81							
CD (0.05) (Varieties)	1.64							
SEd Irrigation levels at the same level of varieties	1.62							
CD (0.05) Irrigation levels at the same level of varieties	NS							
SEd varieties at the same level of Irrigation levels	1.60							
CD (0.05) varieties at the same level of Irrigation levels	NS							
Treatments	Yield of tubers >75g(t/ha)							
	V1	V2	V3	V4	V5	V6	V7	Mean
I1	4.18	8.26	8.83	14.60	10.89	9.56	12.67	9.86
I2	3.03	5.91	6.88	14.99	9.28	10.16	11.66	8.84
I3	1.72	3.69	4.56	8.73	6.17	6.54	8.43	5.69
I4	3.66	7.44	5.78	10.49	10.62	8.66	12.87	8.50
Mean	3.15	6.33	6.51	12.20	9.24	8.73	11.41	
SEd (Irrigation levels)	1.04							
CD (0.05) (Irrigation levels)	2.58							
SEd (Varieties)	0.70							
CD (0.05) (Varieties)	1.41							
SEd Irrigation levels at the same level of varieties	1.40							
CD (0.05) Irrigation levels at the same level of varieties	NS							
SEd varieties at the same level of Irrigation levels	1.66							
CD (0.05) varieties at the same level of Irrigation levels	NS							
Treatments	Total yield (t/ha)							
	V1	V2	V3	V4	V5	V6	V7	Mean
I1	11.99	16.59	20.42	25.04	23.31	19.44	26.05	20.41
I2	10.39	12.39	18.39	25.52	21.86	18.11	22.70	18.48
I3	8.15	8.61	14.02	17.92	16.18	15.30	18.59	14.11
I4	12.16	14.38	15.78	22.32	20.88	14.38	24.05	17.71
Mean	10.67	12.99	17.16	22.70	20.56	16.81	22.85	
SEd (Irrigation levels)	1.27							
CD (0.05) (Irrigation levels)	3.17							
SEd (Varieties)	1.18							
CD (0.05) (Varieties)	2.38							
SEd Irrigation levels at the same level of varieties	2.36							
CD (0.05) Irrigation levels at the same level of varieties	NS							
SEd varieties at the same level of Irrigation levels	2.53							
CD (0.05) varieties at the same level of Irrigation levels	NS							
Treatments	No of tubers 0-25g (000`/ha)							
	V1	V2	V3	V4	V5	V6	V7	Mean
I1	115000	82778	133889	90000	104444	75555	125555	103889
I2	95000	51111	146667	132778	113333	89444	93889	103175
I3	102778	60555	128889	93889	81111	82222	85555	90714
I4	82222	90000	106111	131667	80000	61111	206667	108254
Mean	98750	71111	128889	112083	94722	77083	127917	
SEd (Irrigation levels)	5360							
CD (0.05) (Irrigation levels)	NS							
SEd (Varieties)	12701							
CD (0.05) (Varieties)	25616							
SEd Irrigation levels at the same level	25402							



of varieties								
CD (0.05) Irrigation levels at the same level of varieties	51831							
SEd varieties at the same level of Irrigation levels	24121							
CD (0.05) varieties at the same level of Irrigation levels	49217							
Treatments	No of tubers 25-75g (000`/ha)							
	V1	V2	V3	V4	V5	V6	V7	Mean
I1	77222	76111	116111	123889	130556	120000	138333	111746
I2	69444	80555	115000	113333	135556	93889	130000	105397
I3	75000	75556	126666	123889	141667	118889	126111	112540
I4	66111	77222	90000	100000	99445	67778	112222	87540
Mean	71944	77361	111944	115278	126806	100139	126667	
SEd (Irrigation levels)	6108							
CD (0.05) (Irrigation levels)	15236							
SEd (Varieties)	10288							
CD (0.05) (Varieties)	20750							
SEd Irrigation levels at the same level of varieties	20576							
CD (0.05) Irrigation levels at the same level of varieties	NS							
SEd varieties at the same level of Irrigation levels	20005							
CD (0.05) varieties at the same level of Irrigation levels	NS							
Treatments	No of tubers >75g (000`/ha)							
	V1	V2	V3	V4	V5	V6	V7	Mean
I1	33333	69444	72778	123889	95555	81667	105000	83095
I2	26111	51667	62222	131111	79444	86111	100556	76746
I3	34444	55556	55555	98333	71667	72778	92778	68730
I4	31111	64444	50556	87778	89445	67778	98889	70000
Mean	31250	60278	60278	110278	84028	77083	99306	
SEd (Irrigation levels)	8825							
CD (0.05) (Irrigation levels)	NS							
SEd (Varieties)	6162							
CD (0.05) (Varieties)	12428							
SEd Irrigation levels at the same level of varieties	12324							
CD (0.05) Irrigation levels at the same level of varieties	NS							
SEd varieties at the same level of Irrigation levels	14425							
CD (0.05) varieties at the same level of Irrigation levels	NS							
Treatments	Total no of tubers (000`/ha)							
	V1	V2	V3	V4	V5	V6	V7	Mean
I1	225556	228333	322778	337778	330555	277222	368889	298730
I2	190556	183333	323889	377222	328333	269444	324444	285317
I3	212222	191667	311111	316111	294444	273889	304445	271984
I4	179444	231667	246667	319445	268889	196666	417778	265794
Mean	201945	208750	301111	337639	305556	254305	353889	
SEd (Irrigation levels)	13771							
CD (0.05) (Irrigation levels)	NS							
SEd (Varieties)	20466							
CD (0.05) (Varieties)	41277							
SEd Irrigation levels at the same level of varieties	40932							
CD (0.05) Irrigation levels at the same level of varieties	NS							
SEd varieties at the same level of	40320							

Irrigation levels	
CD (0.05) varieties at the same level of Irrigation levels	NS

**Table 422:** Amount of water applied (mm)

Treatment	Amount of water (mm) applied in each irrigation							Total water applied (mm)
	I	II	III	IV	V	VI	VII	
I1V1	50	50	50	50	50	50	50	350
I1V2	50	50	50	50	50	50	50	350
I1V3	50	50	50	50	50	50	50	350
I1V4	50	50	50	50	50	50	50	350
I1V5	50	50	50	50	50	50	50	350
I1V6	50	50	50	50	50	50	50	350
I1V7	50	50	50	50	50	50	50	350
I2V1	50	50	50	50	50	50		300
I2V2	50	50	50	50	50	50		300
I2V3	50	50	50	50	50	50		300
I2V4	50	50	50	50	50	50		300
I2V5	50	50	50	50	50	50		300
I2V6	50	50	50	50	50	50		300
I2V7	50	50	50	50	50	50		300
I3V1	50	50	50	50	50			250
I3V2	50	50	50	50	50			250
I3V3	50	50	50	50	50			250
I3V4	50	50	50	50	50			250
I3V5	50	50	50	50	50			250
I3V6	50	50	50	50	50			250
I3V7	50	50	50	50	50			250
I4V1	50	50	50	50	50			250
I4V2	50	50	50	50	50			250
I4V3	50	50	50	50	50			250
I4V4	50	50	50	50	50			250
I4V5	50	50	50	50	50			250
I4V6	50	50	50	50	50			250
I4V7	50	50	50	50	50			250

## FAIZABAD

Irrigations (I<sub>2</sub>) given at 25 mm CPE (5 Nos.) produced significantly higher total yield (27.10 & 31.39 t/ha) at 75 and 90 days, respectively in comparison to other irrigation levels, but, it was also found statistically at par with the produce of 4 irrigations (I<sub>3</sub>) applied at 30 mm CPE (26.28 & 30.43 t/ha, respectively). Similar trend was also noticed in case of 0-25, 25-75 and > 75 g size yields and tuber numbers as well as total tuber numbers (5,81,111 and 6,62,222 /ha) at 75 and 90 days, respectively. The application of mulch with 4 irrigations (I<sub>4</sub>) produced significantly higher total yield and tuber numbers as well as graded tuber yields & numbers than other irrigation levels at 75 & 90 days, it was also found statistically superior over other treatments.

The *var.* Kufri Sindhuri (V<sub>3</sub>) produced significantly higher total yield (28.68 & 33.19 t/ha) at 75 and 90 days, respectively, but, it was also found statistically at par with the produce of advance hybrid WS/05-146 (V<sub>1</sub>) which gave 27.59 & 31.96 t/ha, respectively. However, under targeted environment where four irrigations (I<sub>3</sub>) were applied the same trend was observed, but, the differences in total yields were non significant. Similarly, the total and graded (0-25, 25-75 and > 75 g) tuber numbers as well as graded tuber yields were not differ significantly at 75 & 90 days.

**Table 423:** Plant emergence (%), plant growth, no of shoots/plant, grade-wise yield (t/ha) and number of tubers ('000/ha) in 75 days crop

Treatments	% Emergence				Plant Growth			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	96.43	94.64	95.71	95.59	4.00	4.00	4.00	4.00
I2	95.00	95.36	95.36	95.24	4.00	4.00	4.00	4.00
I3	95.36	95.00	95.36	95.24	4.00	4.00	4.00	4.00
I4	95.71	93.93	95.36	95.00	4.00	4.00	4.00	4.00
Mean	95.62	94.73	95.45		4.00	4.00	4.00	
SEd (Irrigation levels)	0.47				0.00			
CD (0.05) (Irrigation levels)	NS				NS			
SEd (Varieties)	0.55				0.00			
CD (0.05) (Varieties)	NS				NS			
SEd Irrigation levels at the same level of varieties	1.10				0.00			
CD (0.05) Irrigation levels at the same level of varieties	NS				NS			
SEd varieties at the same level of Irrigation levels	1.01				0.00			
CD (0.05) varieties at the same level of Irrigation levels	NS				NS			
Treatments	No. of shoots/plant				Yield of tubers 0-25g (t/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	4.29	3.90	4.40	4.20	1.50	1.46	1.74	1.57
I2	4.50	4.24	4.60	4.45	1.89	1.60	1.94	1.81
I3	4.69	4.40	4.80	4.63	1.81	1.63	1.83	1.75
I4	5.10	4.44	5.30	4.95	2.04	1.77	2.15	1.99
Mean	4.64	4.24	4.78		1.81	1.61	1.92	
SEd (Irrigation levels)	0.12				0.06			
CD (0.05) (Irrigation levels)	0.27				0.13			
SEd (Varieties)	0.12				0.06			
CD (0.05) (Varieties)	0.25				0.11			
SEd Irrigation levels at the same level of varieties	0.24				0.11			
CD (0.05) Irrigation levels at the same level of varieties	NS				NS			
SEd varieties at the same level of Irrigation levels	0.23				0.11			
CD (0.05) varieties at the same level of Irrigation levels	NS				NS			
Treatments	Yield of tubers 25-75g (t/ha)				Yield of tubers >75g (t/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	15.41	14.61	16.21	15.41	7.82	7.32	8.20	7.78
I2	17.31	15.33	17.78	16.80	8.74	7.76	8.97	8.49
I3	16.74	14.93	17.22	16.29	8.44	7.57	8.69	8.24
I4	18.95	16.23	19.92	18.37	9.57	8.21	10.07	9.28
Mean	17.10	15.28	17.78		8.64	7.71	8.98	
SEd (Irrigation levels)	0.53				0.27			
CD (0.05) (Irrigation levels)	1.22				0.63			
SEd (Varieties)	0.42				0.22			
CD (0.05) (Varieties)	0.88				0.45			
SEd Irrigation levels at the same level of varieties	0.85				0.43			
CD (0.05) Irrigation levels at the same level of varieties	NS				NS			
SEd varieties at the same level of Irrigation levels	0.87				0.45			
CD (0.05) varieties at the same level of Irrigation levels	NS				NS			

Treatments	Total yield (t/ha)				No of tubers 0-25g (no/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	24.90	23.55	26.14	24.86	110834	107778	115000	111204
I2	27.93	24.69	28.69	27.10	125278	109167	128889	121111
I3	26.98	24.12	27.75	26.28	120000	108333	123889	117407
I4	30.57	26.21	32.14	29.64	135556	117500	143333	132130
Mean	27.59	24.64	28.68		122917	110694	127778	
SEd (Irrigation levels)	0.86				3989			
CD (0.05) (Irrigation levels)	1.97				9151			
SEd (Varieties)	0.69				3196			
CD (0.05) (Varieties)	1.43				6635			
SEd Irrigation levels at the same level of varieties	1.38				6391			
CD (0.05) Irrigation levels at the same level of varieties	NS				NS			
SEd varieties at the same level of Irrigation levels	1.48				6568			
CD (0.05) varieties at the same level of Irrigation levels	NS				NS			
Treatments	No of tubers 25-75g (no/ha)				No of tubers >75g (no/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	335278	317500	324445	325741	87222	90278	91667	89722
I2	376111	332778	386389	365093	97500	86944	100278	94907
I3	364167	324445	374167	354259	94722	85000	97500	92408
I4	411667	352778	432778	399074	107222	91945	112778	103982
Mean	371806	331875	379445		96667	88542	100556	
SEd (Irrigation levels)	9414				2191			
CD (0.05) (Irrigation levels)	21596				5027			
SEd (Varieties)	10684				3081			
CD (0.05) (Varieties)	22183				6396			
SEd Irrigation levels at the same level of varieties	21369				6161			
CD (0.05) Irrigation levels at the same level of varieties	NS				NS			
SEd varieties at the same level of Irrigation levels	19825				5487			
CD (0.05) varieties at the same level of Irrigation levels	NS				NS			
Treatments	Total no of tubers (no/ha)							
	V1	V2	V3	Mean				
I1	533333	515556	531111	526667				
I2	598889	528889	615555	581111				
I3	578889	517778	595555	564074				
I4	654444	562222	688889	635185				
Mean	591389	531111	607778					
SEd (Irrigation levels)	14237							
CD (0.05) (Irrigation levels)	32660							
SEd (Varieties)	15789							
CD (0.05) (Varieties)	32780							
SEd Irrigation levels at the same level of varieties	31577							
CD (0.05) Irrigation levels at the same level of varieties	NS							
SEd varieties at the same level of Irrigation levels	29452							
CD (0.05) varieties at the same level of Irrigation levels	NS							

**Table 424:** Plant emergence (%), plant growth, no of shoots/plant, grade-wise yield (t/ha) and number of tubers ('000/ha) in 90 days crop

Treatments	% Emergence				Plant Growth			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	94.65	95.71	95.71	95.36	4.00	4.00	4.00	4.00
I2	94.64	96.07	95.71	95.48	4.00	4.00	4.00	4.00
I3	94.65	94.64	96.43	95.24	4.00	4.00	4.00	4.00
I4	94.64	94.64	95.00	94.76	4.00	4.00	4.00	4.00
Mean	94.64	95.27	95.71		4.00	4.00	4.00	
SEd (Irrigation levels)	0.45				0.00			
CD (0.05) (Irrigation levels)	NS				NS			
SEd (Varieties)	0.52				0.00			
CD (0.05) (Varieties)	NS				NS			
SEd Irrigation levels at the same level of varieties	1.04				0.00			
CD (0.05) Irrigation levels at the same level of varieties	NS				NS			
SEd varieties at the same level of Irrigation levels	0.96				0.00			
CD (0.05) varieties at the same level of Irrigation levels	NS				NS			
Treatments	No. of shoots/plant				Yield of tubers 0-25g (t/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	4.70	4.31	4.85	4.62	1.55	1.48	1.81	1.61
I2	4.94	4.65	5.00	4.86	1.93	1.71	1.97	1.87
I3	5.10	4.80	5.29	5.06	1.89	1.67	1.92	1.82
I4	5.60	4.15	5.80	5.18	2.13	1.82	2.21	2.05
Mean	5.08	4.48	5.23		1.87	1.67	1.98	
SEd (Irrigation levels)	0.16				0.06			
CD (0.05) (Irrigation levels)	0.37				0.14			
SEd (Varieties)	0.13				0.05			
CD (0.05) (Varieties)	0.27				0.10			
SEd Irrigation levels at the same level of varieties	0.26				0.10			
CD (0.05) Irrigation levels at the same level of varieties	0.55				NS			
SEd varieties at the same level of Irrigation levels	0.27				0.10			
CD (0.05) varieties at the same level of Irrigation levels	0.57				NS			
Treatments	Yield of tubers 25-75g (t/ha)				Yield of tubers >75g (t/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	17.01	16.11	17.86	16.99	10.09	9.56	10.58	10.07
I2	19.10	16.90	19.61	18.54	11.32	10.00	11.64	10.99
I3	18.42	16.48	18.97	17.96	10.95	9.78	11.24	10.65
I4	20.90	17.90	21.94	20.25	12.39	10.64	13.03	12.02
Mean	18.86	16.85	19.60		11.18	9.99	11.62	
SEd (Irrigation levels)	0.59				0.34			
CD (0.05) (Irrigation levels)	1.35				0.79			
SEd (Varieties)	0.47				0.28			
CD (0.05) (Varieties)	0.98				0.58			
SEd Irrigation levels at the same level of varieties	0.94				0.56			
CD (0.05) Irrigation levels at the same level of varieties	NS				NS			
SEd varieties at the same level of Irrigation levels	0.97				0.57			
CD (0.05) varieties at the same level of Irrigation levels	NS				NS			
Treatments	Total yield (t/ha)				No of tubers 0-25g (no/ha)			

	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	28.82	27.30	30.25	28.79	108056	102500	112500	107685
I2	32.34	28.61	33.22	31.39	120833	106111	122778	116574
I3	31.25	27.93	32.12	30.43	117500	104167	119722	113796
I4	35.42	30.36	37.18	34.32	132500	114167	138056	128241
Mean	31.96	28.55	33.19		119722	106736	123264	
SEd (Irrigation levels)	0.99				3673			
CD (0.05) (Irrigation levels)	2.28				8427			
SEd (Varieties)	0.80				2983			
CD (0.05) (Varieties)	1.66				6193			
SEd Irrigation levels at the same level of varieties	1.60				5966			
CD (0.05) Irrigation levels at the same level of varieties	NS				NS			
SEd varieties at the same level of Irrigation levels	1.64				6101			
CD (0.05) varieties at the same level of Irrigation levels	NS				NS			
Treatments	No of tubers 25-75g (no/ha)				No of tubers >75g (no/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	386667	365833	405556	386019	114167	108334	119722	114074
I2	433889	383889	445278	421019	128611	113333	131944	124630
I3	418334	374722	430556	407871	124167	111111	127500	120926
I4	475000	406389	498611	460000	140278	120556	147778	136204
Mean	428472	382708	445000		126806	113333	131736	
SEd (Irrigation levels)	13488				3929			
CD (0.05) (Irrigation levels)	30942				9013			
SEd (Varieties)	10716				3200			
CD (0.05) (Varieties)	22249				6643			
SEd Irrigation levels at the same level of varieties	21432				6400			
CD (0.05) Irrigation levels at the same level of varieties	NS				NS			
SEd varieties at the same level of Irrigation levels	22094				6538			
CD (0.05) varieties at the same level of Irrigation levels	NS				NS			
Treatments	Total no of tubers (no/ha)							
	V1	V2	V3	Mean				
I1	608889	576667	637778	607778				
I2	683333	603333	700000	662222				
I3	660000	590000	677778	642592				
I4	747778	641111	784445	724445				
Mean	675000	602778	700000					
SEd (Irrigation levels)	21054							
CD (0.05) (Irrigation levels)	48299							
SEd (Varieties)	16862							
CD (0.05) (Varieties)	35009							
SEd Irrigation levels at the same level of varieties	33724							
CD (0.05) Irrigation levels at the same level of varieties	NS							
SEd varieties at the same level of Irrigation levels	34662							
CD (0.05) varieties at the same level of Irrigation levels	NS							

## GWALIOR

Irrigations given at 2.5 IW: CPE ratio ( $I_1$ ) produced significantly higher total yield & numbers (26.29 t/ha and 5,15,625 tubers/ha, respectively) at 75 days, it was also found statistically at par with the produce of irrigations ( $I_2$ ) applied at 2.0 IW: CPE ratio (25.79 t/ha and 4,91,071 tubers/ha, respectively). However, the effect of irrigation levels was non significant on graded tuber yields and numbers except yield of >75 g size tubers. At 90 days harvest, irrigations at 2.0 IW: CPE ratio ( $I_2$ ) produced significantly higher total yield & tuber numbers (30.40 t/ha and 5,13,914 tubers/ha, respectively) and it was also found statistically superior than other irrigation treatments. Similar trend was also observed in case of all grades of tuber numbers as well as yields of 50-75 & >75 g. The application of mulch with irrigation treatment ( $I_4$ ) showed significant effect on potato.

Effect of varieties was non significant on total and grade wise tuber yields as well as numbers at 75 days. While at 90 days, the *var.* Kufri Jyoti ( $V_1$ ) produced significantly higher total yield (27.54 t/ha) in comparison to advance hybrid WS/05-146 (26.24 t/ha), it was also found statistically superior over ( $V_2$ ). Similar trend was also observed in case of >75 g size tuber yield and numbers, *but*, the reverse trend was noticed for yields and tuber numbers of 0-25, 25-50 and 50-75 g size. However, the advance hybrid WS/05-146 ( $V_2$ ) gave significantly maximum tuber numbers (5,41,927/ha) than Kufri Jyoti ( $V_1$ ) which produced 3,51,972 tubers/ha.

**Table 425:** Plant emergence (%), plant growth (cm), no of shoots/plant, grade-wise yield (t/ha) and number of tubers ('000/ha) in 75 days crop

Treatments	% Emergence			Plant growth			No of shoots/plants		
	V1	V2	Mean	V1	V2	Mean	V1	V2	Mean
I1	91.00	90.25	90.63	49.80	43.90	46.85	2.40	5.90	4.15
I2	92.25	90.00	91.13	45.70	49.50	47.60	2.65	5.75	4.20
I3	92.00	85.25	88.63	43.40	51.05	47.23	2.90	6.45	4.68
I4	93.25	91.50	92.38	46.90	54.45	50.68	3.45	5.35	4.40
MEAN	92.13	89.25		46.45	49.73		2.85	5.86	
SEd (Irrigation levels)	1.12			0.43			0.15		
CD (0.05) (Irrigation levels)	2.56			1.00			0.33		
SEd (Varieties)	0.65			0.38			0.08		
CD (0.05) (Varieties)	1.43			0.84			0.18		
SEd Irrigation levels at the same level of varieties	1.30			0.76			0.16		
CD (0.05) Irrigation levels at the same level of varieties	2.93			1.70			0.36		
SEd varieties at the same level of Irrigation levels	1.45			0.69			0.18		
CD (0.05) varieties at the same level of Irrigation levels	3.26			1.54			0.41		
Treatments	Yield of tubers 0-25g (t/ha)			Yield of tubers 25-50g (t/ha)			Yield of tubers 50-75g (t/ha)		
	V1	V2	Mean	V1	V2	Mean	V1	V2	Mean
I1	2.13	2.10	2.12	2.16	3.40	2.78	6.13	3.99	5.06
I2	1.89	1.88	1.88	3.23	2.92	3.08	4.30	4.91	4.60
I3	1.57	1.84	1.71	3.39	1.94	2.66	4.18	3.44	3.81
I4	1.10	2.05	1.57	2.94	3.42	3.18	5.59	3.58	4.59
MEAN	1.67	1.97		2.93	2.92		5.05	3.98	
SEd (Irrigation levels)	0.31			0.36			0.82		
CD (0.05) (Irrigation levels)	NS			NS			NS		
SEd (Varieties)	0.30			0.43			0.68		
CD (0.05) (Varieties)	NS			NS			NS		
SEd Irrigation levels at the same level of varieties	0.60			0.86			1.36		
CD (0.05) Irrigation levels at the same level of	NS			NS			NS		

varieties									
SEd varieties at the same level of Irrigation levels	0.52			0.70			1.26		
CD (0.05) varieties at the same level of Irrigation levels	NS			NS			NS		
Treatments	Yield of tubers >75g(t/ha)			Total yield (t/ha)			No of tubres 0-25 (000'/ha)		
	V1	V2	Mean	V1	V2	Mean	V1	V2	Mean
I1	17.75	14.94	16.34	28.17	24.42	26.29	216518	212797	214658
I2	17.92	14.55	16.23	27.32	24.25	25.79	205357	200893	203125
I3	11.71	8.64	10.18	20.84	15.85	18.35	144345	155506	149926
I4	13.57	12.42	12.99	23.20	21.45	22.33	107143	176339	141741
MEAN	15.24	12.64		24.88	21.49		168341	186384	
SEd (Irrigation levels)	1.45			1.71			36843		
CD (0.05) (Irrigation levels)	3.34			3.93			NS		
SEd (Varieties)	2.37			2.20			25248		
CD (0.05) (Varieties)	NS			NS			NS		
SEd Irrigation levels at the same level of varieties	4.74			4.39			50495		
CD (0.05) Irrigation levels at the same level of varieties	NS			NS			NS		
SEd varieties at the same level of Irrigation levels	3.65			3.55			51306		
CD (0.05) varieties at the same level of Irrigation levels	NS			NS			NS		
Treatments	No of tubres 25-50g (000'/ha)			No of tubres 50-75g (000'/ha)			No of tubres >75g (000'/ha)		
	V1	V2	Mean	V1	V2	Mean	V1	V2	Mean
I1	61756	103423	82589	107887	67708	87798	132441	128720	130580
I2	92262	100446	96354	71429	75149	73289	124256	112351	118304
I3	96726	52084	74405	66965	58036	62500	107143	72917	90030
I4	79613	102679	91146	72917	63244	68080	122024	99702	110863
MEAN	82589	89658		79799	66034		121466	103423	
SEd (Irrigation levels)	8746			11961			17483		
CD (0.05) (Irrigation levels)	NS			NS			NS		
SEd (Varieties)	12058			9933			18691		
CD (0.05) (Varieties)	NS			NS			NS		
SEd Irrigation levels at the same level of varieties	24116			19865			37382		
CD (0.05) Irrigation levels at the same level of varieties	NS			NS			NS		
SEd varieties at the same level of Irrigation levels	19164			18450			31692		
CD (0.05) varieties at the same level of Irrigation levels	NS			NS			NS		
Treatments	Total no of tubers (000'/ha)								
	V1	V2	Mean						
I1	518601	512649	515625						
I2	493304	488839	491071						
I3	415179	338542	376860						
I4	381696	441964	411830						
MEAN	452195	445498							
SEd (Irrigation levels)	44844								
CD (0.05) (Irrigation levels)	102874								
SEd (Varieties)	25467								
CD (0.05) (Varieties)	NS								
SEd Irrigation levels at the	50934								



same level of varieties		
CD (0.05) Irrigation levels at the same level of varieties	NS	
SEd varieties at the same level of Irrigation levels	57516	
CD (0.05) varieties at the same level of Irrigation levels	NS	

**Table 426:** Plant emergence (%), plant growth (cm), no of shoots/plant, grade-wise yield (t/ha) and number of tubers ('000/ha) in 90 days crop

Treatments	% Emergence			Plant growth			No of shoots/plants		
	V1	V2	Mean	V1	V2	Mean	V1	V2	Mean
I1	91.00	90.25	90.63	49.80	43.90	46.85	2.40	5.90	4.15
I2	92.25	90.00	91.13	45.70	49.50	47.60	2.65	5.75	4.20
I3	92.00	85.25	88.63	43.40	51.05	47.23	2.90	6.45	4.68
I4	93.25	91.50	92.38	46.90	54.45	50.68	3.45	5.35	4.40
MEAN	92.13	89.25		46.45	49.73		2.85	5.86	
SEd (Irrigation levels)	1.12			0.43			0.15		
CD (0.05) (Irrigation levels)	2.56			1.00			0.33		
SEd (Varieties)	0.65			0.38			0.08		
CD (0.05) (Varieties)	1.43			0.84			0.18		
SEd Irrigation levels at the same level of varieties	1.30			0.76			0.16		
CD (0.05) Irrigation levels at the same level of varieties	2.93			1.70			0.36		
SEd varieties at the same level of Irrigation levels	1.45			0.69			0.18		
CD (0.05) varieties at the same level of Irrigation levels	3.26			1.54			0.41		
Treatments	Yield of tubers 0-25g (t/ha)			Yield of tubers 25-50g (t/ha)			Yield of tubers 50-75g (t/ha)		
	V1	V2	Mean	V1	V2	Mean	V1	V2	Mean
I1	0.98	2.51	1.75	2.96	5.35	4.16	4.69	6.28	5.48
I2	1.11	2.49	1.80	2.77	5.06	3.92	4.74	7.22	5.98
I3	1.03	1.66	1.34	2.04	2.72	2.38	3.61	5.70	4.65
I4	1.03	2.06	1.55	2.58	5.16	3.87	4.11	7.65	5.88
MEAN	1.04	2.18		2.59	4.57		4.28	6.71	
SEd (Irrigation levels)	0.11			0.21			0.27		
CD (0.05) (Irrigation levels)	0.24			0.49			0.63		
SEd (Varieties)	0.07			0.11			0.24		
CD (0.05) (Varieties)	0.15			0.24			0.52		
SEd Irrigation levels at the same level of varieties	0.14			0.22			0.48		
CD (0.05) Irrigation levels at the same level of varieties	0.31			0.49			NS		
SEd varieties at the same level of Irrigation levels	0.14			0.26			0.43		
CD (0.05) varieties at the same level of Irrigation levels	0.32			0.59			NS		
Treatments	Yield of tubers >75g(t/ha)			Total yield (t/ha)			No of tubres 0-25g ('000'/ha)		
	V1	V2	Mean	V1	V2	Mean	V1	V2	Mean
I1	21.19	13.85	17.52	29.81	27.99	28.90	76339	230953	153646
I2	22.57	14.85	18.71	31.18	29.62	30.40	90922	257143	174033
I3	15.46	10.06	12.76	22.13	20.14	21.13	86905	169643	128274
I4	19.35	12.36	15.85	27.06	27.22	27.14	99107	200893	150000

MEAN	19.64	12.78		27.54	26.24		88318	214658	
SEd (Irrigation levels)	0.41			0.48			4037		
CD (0.05) (Irrigation levels)	0.93			1.09			9260		
SEd (Varieties)	0.23			0.31			3198		
CD (0.05) (Varieties)	0.50			0.67			7044		
SEd Irrigation levels at the same level of varieties	0.46			0.61			6395		
CD (0.05) Irrigation levels at the same level of varieties	1.03			NS			14347		
SEd varieties at the same level of Irrigation levels	0.52			0.64			6062		
CD (0.05) varieties at the same level of Irrigation levels	1.17			NS			13598		
Treatments	No of tubres 25-50g (000'/ha)			No of tubres 50-75g (000'/ha)			No of tubres >75g (000'/ha)		
	V1	V2	Mean	V1	V2	Mean	V1	V2	Mean
I1	68601	138840	103720	59375	91071	75223	133185	94196	113690
I2	86459	147917	117188	66518	107738	87128	148512	122619	135566
I3	49702	86012	67857	55060	95238	75149	118304	80357	99330
I4	73661	143601	108631	58929	110715	84822	136310	90774	113542
MEAN	69606	129092		59970	101190		134077	96987	
SEd (Irrigation levels)	4097			4695			4332		
CD (0.05) (Irrigation levels)	9399			NS			9937		
SEd (Varieties)	3769			3547			3196		
CD (0.05) (Varieties)	8304			7813			7042		
SEd Irrigation levels at the same level of varieties	7539			7094			6393		
CD (0.05) Irrigation levels at the same level of varieties	16863			NS			NS		
SEd varieties at the same level of Irrigation levels	6723			6871			6261		
CD (0.05) varieties at the same level of Irrigation levels	15039			NS			NS		
Treatments	Total no of tubres (000'/ha)								
	V1	V2	Mean						
I1	337500	555060	446280						
I2	392411	635417	513914						
I3	309970	431250	370610						
I4	368006	545982	456994						
MEAN	351972	541927							
SEd (Irrigation levels)	6830								
CD (0.05) (Irrigation levels)	15669								
SEd (Varieties)	9512								
CD (0.05) (Varieties)	20953								
SEd Irrigation levels at the same level of varieties	19023								
CD (0.05) Irrigation levels at the same level of varieties	42262								
SEd varieties at the same level of Irrigation levels	15086								
CD (0.05) varieties at the same level of Irrigation levels	33516								

**Table 427:** Moisture content % before Irrigations

Treatment	Kufri Jyoti			WS/05-146		
	Before II Irrigation					
	0-15	15-30	30-45	0-15	15-30	30-45

I1	14.29	14.74	17.48	14.29	15.91	20.27
I2	13.41	16.08	18.43	14.88	15.63	16.29
I3	13.16	14.45	15.19	13.01	16.01	18.66
I4	15.07	15.57	17.72	14.44	15.49	15.13
Before III Irrigation						
	0-15	15-30	30-45	0-15	15-30	30-45
I1	13.65	15.93	16.55	12.96	13.47	16.09
I2	14.82	15.29	15.30	13.70	14.41	14.60
I3	14.44	16.40	17.48	14.56	16.52	17.20
I4	15.75	16.48	16.76	15.35	16.72	17.14
Before IV Irrigation						
	0-15	15-30	30-45	0-15	15-30	30-45
I1	15.27	19.38	20.01	15.48	16.77	16.63
I2	13.69	15.76	16.58	13.52	14.05	14.77
I3	13.95	15.54	17.28	15.44	16.04	12.65
I4	15.10	15.93	15.89	14.54	16.12	16.63
Before V Irrigation						
	0-15	15-30	30-45	0-15	15-30	30-45
I1	17.18	17.78	19.67	17.87	18.62	19.70
I2	14.90	10.42	20.01	15.23	17.02	18.23
I3	15.92	16.86	18.10	15.61	17.02	17.73
I4	19.11	18.54	17.88	14.65	16.19	17.02
Before VI Irrigation						
	0-15	15-30	30-45	0-15	15-30	30-45
I1	16.69	17.58	18.92	15.10	17.31	17.06
I2	15.33	16.58	18.59	15.35	16.71	16.41
I3	17.30	18.27	21.49	19.32	18.65	20.61
I4	21.51	20.62	20.01	15.51	19.51	18.81
Before VII Irrigation						
	0-15	15-30	30-45	0-15	15-30	30-45
I1	16.80	18.08	20.63	13.80	16.58	16.36
I2	13.56	17.29	15.78	17.14	17.51	13.26

## HISAR

Irrigations given at 2.0 IW: CPE ratio (I<sub>2</sub>) produced significantly higher total yield (30.52 & 35.13 t/ha) at 75 and 90 days, respectively against other treatments, and it was also found statistically at par with the produce of irrigations (I<sub>1</sub>) applied at 2.5 IW: CPE ratio (30.47 & 33.53 t/ha, respectively). Similar trend was also noticed in case of marketable tuber yields at 75 days, but, the reverse trend was observed at 90 days harvest.

Advance hybrid WS/05-146 (V<sub>1</sub>) produced significantly higher total yield (33.61 & 37.62 t/ha) at 75 and 90 days, respectively against Kufri Bahar (V<sub>2</sub>) and other hybrid (V<sub>3</sub>), and it was also found statistically superior over control. Under targeted environment where irrigations given at 1.5 IW: CPE ratio (I<sub>3</sub>), the hybrid WS/05-146 produced significantly higher yields (29.97 & 36.18 t/ha) and also saved 28 % water in comparison Kufri Bahar (V<sub>2</sub>) which gave 24.35 & 27.43 t/ha at 75 and 90 days, respectively. Similar trend was also noticed in case of marketable yields at 75 & 90 days, and tuber numbers at 90 days harvest.

**Table 428:** Plant emergence (%), plant growth (cm), no of shoots/plant, marketable & total yield (t/ha) and number of marketable & total tubers ('000/ha) in 75 & 90 days crop

Treatments	75 days crop							
	% Emergence				Plant height (cm)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	97.72	96.47	97.59	97.26	60.26	53.47	50.73	54.82
I2	96.85	94.07	95.47	95.46	56.19	44.40	54.90	51.83
I3	96.62	94.70	94.23	95.19	49.60	40.60	52.00	47.40
I4	98.32	94.69	97.55	96.86	55.10	46.53	54.17	51.93
Mean	97.38	94.98	96.21		55.29	46.25	52.95	
SEd (Irrigation levels)	0.32				1.32			

CD (0.05) (Irrigation levels)	0.74				3.02			
SEd (Varieties)	0.69				1.38			
CD (0.05) (Varieties)	1.43				2.86			
SEd Irrigation levels at the same level of varieties	1.37				2.76			
CD (0.05) Irrigation levels at the same level of varieties	NS				5.88			
SEd varieties at the same level of Irrigation levels	1.17				2.61			
CD (0.05) varieties at the same level of Irrigation levels	NS				5.56			
Treatments	No. of shoots/plant				Mkt yield (t/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	4.87	4.83	4.33	4.68	6.05	2.07	2.91	3.68
I2	5.27	4.00	4.53	4.60	6.54	1.47	4.32	4.11
I3	4.33	4.77	4.67	4.59	4.80	1.40	2.44	2.88
I4	6.07	5.00	3.73	4.93	6.22	1.76	2.11	3.36
Mean	5.13	4.65	4.32		5.90	1.68	2.95	
SEd (Irrigation levels)	0.19				0.33			
CD (0.05) (Irrigation levels)	NS				0.76			
SEd (Varieties)	0.26				0.38			
CD (0.05) (Varieties)	0.53				0.79			
SEd Irrigation levels at the same level of varieties	0.51				0.76			
CD (0.05) Irrigation levels at the same level of varieties	1.08				NS			
SEd varieties at the same level of Irrigation levels	0.46				0.70			
CD (0.05) varieties at the same level of Irrigation levels	0.97				NS			
Treatments	Total yield (t/ha)							
	V1	V2	V3	Mean				
I1	36.97	25.45	28.99	30.47				
I2	36.04	24.80	30.71	30.52				
I3	29.97	24.35	30.08	28.13				
I4	31.45	26.80	28.80	29.02				
Mean	33.61	25.35	29.65					
SEd (Irrigation levels)	0.75							
CD (0.05) (Irrigation levels)	1.71							
SEd (Varieties)	0.59							
CD (0.05) (Varieties)	1.22							
SEd Irrigation levels at the same level of varieties	1.18							
CD (0.05) Irrigation levels at the same level of varieties	2.54							
SEd varieties at the same level of Irrigation levels	1.22							
CD (0.05) varieties at the same level of Irrigation levels	2.62							
<b>90 days crop</b>								
Treatments	% Emergence				Mkt yield (t/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	98.32	94.69	97.55	96.86	5.15	2.13	3.32	3.53
I2	96.07	95.55	95.64	95.75	5.99	0.92	1.57	2.83
I3	95.89	94.27	96.67	95.61	4.24	0.80	3.41	2.82
I4	96.16	96.96	97.51	96.88	5.18	1.08	2.40	2.89
Mean	96.61	95.37	96.84		5.14	1.23	2.67	
SEd (Irrigation levels)	0.93				0.17			
CD (0.05) (Irrigation levels)	NS				0.39			
SEd (Varieties)	0.60				0.36			
CD (0.05) (Varieties)	1.24				0.75			

SEd Irrigation levels at the same level of varieties	1.20				0.72			
CD (0.05) Irrigation levels at the same level of varieties	NS				NS			
SEd varieties at the same level of Irrigation levels	1.35				0.61			
CD (0.05) varieties at the same level of Irrigation levels	NS				NS			
Treatments	Total yield (t/ha)				No of Mkt tubers (000'/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	38.42	29.19	32.98	33.53	291667	233796	253241	259568
I2	38.70	35.25	31.43	35.13	375926	261574	245370	294290
I3	36.18	27.43	34.02	32.54	421296	282407	294444	332716
I4	37.17	31.07	34.42	34.22	336574	189815	169908	232099
Mean	37.62	30.74	33.21		356366	241898	240741	
SEd (Irrigation levels)	0.76				29012			
CD (0.05) (Irrigation levels)	1.74				66556			
SEd (Varieties)	0.68				17147			
CD (0.05) (Varieties)	1.41				35601			
SEd Irrigation levels at the same level of varieties	1.36				34295			
CD (0.05) Irrigation levels at the same level of varieties	2.91				NS			
SEd varieties at the same level of Irrigation levels	1.34				40321			
CD (0.05) varieties at the same level of Irrigation levels	2.88				NS			
Treatments	Total no of tubers (no/ha)							
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	950000	776852	961574	896142				
I2	1071296	875000	943982	963426				
I3	1154167	872685	889352	972068				
I4	933334	780093	805093	839506				
Mean	1027199	826158	900000					
SEd (Irrigation levels)	56791							
CD (0.05) (Irrigation levels)	NS							
SEd (Varieties)	39577							
CD (0.05) (Varieties)	82168							
SEd Irrigation levels at the same level of varieties	79153							
CD (0.05) Irrigation levels at the same level of varieties	NS							
SEd varieties at the same level of Irrigation levels	86035							
CD (0.05) varieties at the same level of Irrigation levels	NS							

**Table 429:** Number of irrigation and amount of water applied (mm)

Treat-ments	Number of irrigations applied at different DAP							Amount of water (mm) applied in each irrigation							Total water applied (mm)
	I*	II	III	IV	V	VI	VII	I	II	III	IV	V	VI	VII	
V <sub>1</sub> I <sub>1</sub>	2	11	23	38	52	70	87	40	40	40	40	40	40	40	280
V <sub>2</sub> I <sub>1</sub>	2	11	23	38	52	70	87	40	40	40	40	40	40	40	280
V <sub>3</sub> I <sub>1</sub>	2	11	23	38	52	70	87	40	40	40	40	40	40	40	280
V <sub>1</sub> I <sub>2</sub>	2	13	30	49	69	87		40	40	40	40	40	40		240
V <sub>2</sub> I <sub>2</sub>	2	13	30	49	69	87		40	40	40	40	40	40		240
V <sub>3</sub> I <sub>2</sub>	2	13	30	49	69	87		40	40	40	40	40	40		240
V <sub>1</sub> I <sub>3</sub>	2	14	35	55	82			40	40	40	40	40			200
V <sub>2</sub> I <sub>3</sub>	2	14	35	55	82			40	40	40	40	40			200

V <sub>3</sub> l <sub>3</sub>	2	14	35	55	82			40	40	40	40	40			200
V <sub>1</sub> l <sub>4</sub>	2	14	35	55	82			40	40	40	40	40			200
V <sub>2</sub> l <sub>4</sub>	2	14	35	55	82			40	40	40	40	40			200
V <sub>3</sub> l <sub>4</sub>	2	14	35	55	82			40	40	40	40	40			200

## MODIPURAM

Irrigations applied at 2.5 IW: CPE ratio (I<sub>1</sub>) produced significantly higher tuber yield (50.0 t/ha) in comparison to other irrigation levels, but, it was also found at par with the yield produced by irrigations (I<sub>2</sub>) given at 2.0 IW: CPE ratio (48.2 t/ha). Similar trend was also noticed in case of > 75 g size tuber yield. The growth parameters (plant height and no. of leaves/plant) supports the findings. However, the total and graded tuber numbers and DM content did not differ significantly with irrigation levels, but, total dry matter produce (8.7 t/ha) was significantly higher when irrigations applied at 2.5 IW: CPE ratio (I<sub>1</sub>).

The *var.* Kufri Pukhraj (V<sub>1</sub>) produced significantly higher total tuber yield (49.4 t/ha, respectively) in comparison to advance hybrid WS/05-146 (V<sub>2</sub>) which produced 43.6 t/ha. However, the total tuber numbers (948 thousand/ha) and dry matter content (18.9 %) was recorded maximum in advance hybrid WS/05-146 (V<sub>2</sub>) than Kufri Pukhraj (V<sub>1</sub>) which gave 802 thous. tubers/ha and 16.5 % dry matter content. Similar trend was also observed in case of 0-25 & 25-75 g size tuber yields and numbers. However, the yield and tuber numbers of >75 g size was significantly higher in Kufri Pukhraj (V<sub>1</sub>) in comparison to advance hybrid (V<sub>2</sub>).

**Table 430:** Productivity and inputs use efficiency as influenced by different irrigation levels and potato varieties.

Treatment	Emergence (%)	Growth characters			Potato yield (t/ha)			
		Plant height (cm)	Stems/plant	Leaves /plant	Large (>75g)	Medium (25-75g)	Small (<25g)	Total
a). Main plots - Irrigation levels								
I <sub>1</sub>	98.70	63.40	4.30	41.80	24.80	21.80	3.30	50.00
I <sub>2</sub>	98.40	62.50	4.30	39.10	24.00	21.10	3.10	48.20
I <sub>3</sub>	98.60	54.50	4.10	38.20	15.00	23.60	3.20	42.50
I <sub>4</sub>	98.50	57.50	4.40	39.70	17.00	24.00	4.20	45.20
SE m (±)	-	1.40	0.30	1.80	1.50	1.10	0.30	1.50
CD at 5%	-	3.10	N.S.	N.S.	3.00	2.30	0.70	3.10
b). Sub plots - Potato varieties								
Kufri Pukhraj	98.60	58.80	4.10	39.10	25.60	20.90	2.80	49.40
WS/05-146	98.50	57.60	4.60	41.00	14.80	24.40	4.40	43.60
SE m (±)	-	1.10	0.20	1.20	1.40	0.80	0.20	1.10
CD at 5%	-	N.S.	0.40	2.50	3.00	1.60	0.50	2.20

Table contd.....

Treatment	Tuber numbers (thous./ha)				Dry Matter (%)	Total DM (t/ha)
	Large (>75g)	Medium (25-75g)	Small (<25g)	Total		
a). Main plots - Irrigation levels						
I <sub>1</sub>	167	416	282	867	17.49	8.70
I <sub>2</sub>	155	423	290	868	17.63	8.47
I <sub>3</sub>	131	437	300	868	17.72	7.51
I <sub>4</sub>	129	453	314	895	17.71	7.97
SE m (±)	12	15	18	22	0.14	0.27
CD at 5%	NS	NS	NS	NS	NS	0.56
b). Sub plots - Potato varieties						
Kufri Pukhraj	158	404	240	802	16.48	8.10
WS/05-146	133	469	352	948	18.88	8.23
SE m (±)	8	11	13	16	0.10	0.19
CD at 5%	17	22	27	32	0.21	NS

## RAIPUR

Irrigations (I<sub>1</sub>) given at 20 mm CPE (6 Nos.) produced significantly higher total yield (15.57 and 17.30 t/ha) at 75 and 90 days, respectively in comparison to other irrigation levels, it was also found statistically superior over other treatments. Similar trend was also noticed in case of 25-75 & >75 g size yields. However, the tuber numbers was significantly higher (5,37,180 and 4,04,081 tubers/ha) when irrigations (I<sub>4</sub>) applied at 30 mm CPE with mulch at 75 and 90 days, respectively. The similar trend was also observed in case of < 25 g size tubers. The application of mulch with irrigation treatment (I<sub>4</sub>) showed significant effect on total yield and tuber numbers at both stages.

The CP-4175 (V<sub>2</sub>) produced significantly higher yield (14.55 & 16.01 t/ha) followed by Kufri Pukhraj (V<sub>3</sub>) as compared to hybrid WS/05-146 (V<sub>1</sub>) at 75 and 90 days, respectively. The similar trend was also observed in case of 25-75 & >75 g size tuber yields and numbers at both the stages. However, in case of total tuber numbers, CP-4175 (V<sub>2</sub>) gave higher tubers at 75 days, while at 90 days Kufri Pukhraj (V<sub>3</sub>) produced significantly higher tuber numbers than WS/05-146 (V<sub>1</sub>).

**Table 431:** Plant emergence (%), plant growth, no of shoots/plant, grade-wise yield (t/ha) and number of tubers ('000/ha) in 75 days crop

Treatments	% Emergence				Plant Growth			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	67.36	65.28	93.05	75.23	30.35	40.09	39.03	36.49
I2	65.97	78.47	88.19	77.55	33.82	41.91	34.05	36.59
I3	64.58	63.89	90.28	72.92	31.55	36.23	31.40	33.06
I4	58.33	52.08	88.19	66.20	33.78	41.39	37.47	37.55
Mean	64.06	64.93	89.93		32.37	39.91	35.49	
SEd (Irrigation levels)	4.51				2.10			
CD (0.05) (Irrigation levels)	NS				NS			
SEd (Varieties)	3.58				1.80			
CD (0.05) (Varieties)	7.65				3.85			
SEd Irrigation levels at the same level of varieties	7.16				3.60			
CD (0.05) Irrigation levels at the same level of varieties	NS				NS			
SEd varieties at the same level of Irrigation levels	7.38				3.61			
CD (0.05) varieties at the same level of Irrigation levels	NS				NS			
Treatments	No. of shoots/plant				Yield of tubers 0-25g (t/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	2.80	3.07	3.00	2.96	4.97	6.05	6.64	5.89
I2	4.47	3.20	3.60	3.76	3.10	4.46	3.08	3.55
I3	2.07	4.20	3.40	3.22	5.05	3.02	3.81	3.96
I4	4.87	3.80	3.67	4.11	5.63	6.21	6.62	6.15
Mean	3.55	3.57	3.42		4.69	4.94	5.04	
SEd (Irrigation levels)	0.28				0.17			
CD (0.05) (Irrigation levels)	0.70				0.43			
SEd (Varieties)	0.79				0.31			
CD (0.05) (Varieties)	NS				NS			
SEd Irrigation levels at the same level of varieties	1.57				0.61			
CD (0.05) Irrigation levels at the same level of varieties	NS				1.33			
SEd varieties at the same level of Irrigation levels	1.31				0.53			
CD (0.05) varieties at the same level of Irrigation levels	NS				1.15			
Treatments	Yield of tubers 25-75g (t/ha)				Yield of tubers >75g (t/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean

I1	5.55	7.65	6.60	6.60	2.80	3.30	2.24	2.78
I2	5.00	6.15	4.70	5.28	2.47	2.82	3.07	2.79
I3	2.89	5.73	5.45	4.69	0.85	2.06	1.20	1.37
I4	4.34	6.36	6.70	5.80	2.44	3.23	1.52	2.40
Mean	4.45	6.47	5.86		2.14	2.85	2.01	
SEd (Irrigation levels)	0.09				0.11			
CD (0.05) (Irrigation levels)	0.23				0.26			
SEd (Varieties)	0.10				0.09			
CD (0.05) (Varieties)	0.21				0.19			
SEd Irrigation levels at the same level of varieties	0.20				0.18			
CD (0.05) Irrigation levels at the same level of varieties	0.44				0.40			
SEd varieties at the same level of Irrigation levels	0.19				0.18			
CD (0.05) varieties at the same level of Irrigation levels	0.41				0.41			
Treatments	Total yield (t/ha)				No of tubers 0-25g (no/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	13.77	17.26	15.69	15.57	231222	264389	317192	270934
I2	11.78	13.55	12.15	12.49	154619	222156	128834	168536
I3	9.25	11.22	11.08	10.51	361200	147233	192911	233781
I4	12.80	16.15	14.94	14.63	353381	346567	401689	367212
Mean	11.90	14.55	13.46		275106	245086	260157	
SEd (Irrigation levels)	0.25				33310			
CD (0.05) (Irrigation levels)	0.61				83091			
SEd (Varieties)	0.31				30941			
CD (0.05) (Varieties)	0.66				NS			
SEd Irrigation levels at the same level of varieties	0.62				61882			
CD (0.05) Irrigation levels at the same level of varieties	NS				138994			
SEd varieties at the same level of Irrigation levels	0.56				60519			
CD (0.05) varieties at the same level of Irrigation levels	NS				135931			
Treatments	No of tubers 25-75g (no/ha)				No of tubers >75g (no/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	85667	172545	140085	132765.70	33018	38807	26418	32748.00
I2	93922	117059	117267	109416.20	29145	33156	36155	32818.55
I3	63078	127189	103704	97990.11	10078	24303	14093	16158.00
I4	135744	141808	129437	135663.00	28733	38059	17904	28232.22
Mean	94603	139650	122623		25244	33581	23643	
SEd (Irrigation levels)	4507				1240			
CD (0.05) (Irrigation levels)	11242				3094			
SEd (Varieties)	6503				1027			
CD (0.05) (Varieties)	13905				2196			
SEd Irrigation levels at the same level of varieties	13006				2054			
CD (0.05) Irrigation levels at the same level of varieties	28516				4651			
SEd varieties at the same level of Irrigation levels	11536				2086			
CD (0.05) varieties at the same level of Irrigation levels	25294				4723			
Treatments	Total no of tubers (no/ha)							
	V1	V2	V3	Mean				
I1	376385	490211	487937	451511				
I2	312048	374541	301237	329275				
I3	443222	308674	331504	361133				
I4	532319	528900	550322	537180				



Mean	415994	425582	417750	
SEd (Irrigation levels)	32850			
CD (0.05) (Irrigation levels)	81945			
SEd (Varieties)	32813			
CD (0.05) (Varieties)	NS			
SEd Irrigation levels at the same level of varieties	65626			
CD (0.05) Irrigation levels at the same level of varieties	NS			
SEd varieties at the same level of Irrigation levels	62851			
CD (0.05) varieties at the same level of Irrigation levels	NS			

**Table 432:** Plant emergence (%), plant growth, no of shoots/plant, grade-wise yield (t/ha) and number of tubers ('000/ha) in 90 days crop

Treatments	Yield of tubers 0-25g (t/ha)				Yield of tubers 25-75g (t/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	5.11	5.97	7.27	6.12	6.13	8.25	6.47	6.95
I2	3.97	2.96	4.51	3.81	5.71	7.90	5.57	6.40
I3	5.32	3.21	4.86	4.46	3.87	5.74	5.17	4.93
I4	6.56	7.70	5.84	6.70	5.10	5.38	6.79	5.76
Mean	5.24	4.96	5.62		5.21	6.82	6.00	
SEd (Irrigation levels)	0.13				0.15			
CD (0.05) (Irrigation levels)	0.33				0.38			
SEd (Varieties)	0.12				0.16			
CD (0.05) (Varieties)	0.26				0.34			
SEd Irrigation levels at the same level of varieties	0.24				0.32			
CD (0.05) Irrigation levels at the same level of varieties	0.55				0.71			
SEd varieties at the same level of Irrigation levels	0.24				0.30			
CD (0.05) varieties at the same level of Irrigation levels	0.54				0.68			
Treatments	Yield of tubers >75g (t/ha)				Total yield (t/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	3.47	4.41	3.36	3.75	15.19	19.15	17.55	17.30
I2	2.00	3.24	1.86	2.36	12.78	14.90	13.26	13.65
I3	1.47	2.41	1.50	1.80	10.98	12.51	12.65	12.05
I4	1.53	3.12	2.37	2.34	14.08	17.46	15.93	15.82
Mean	2.12	3.30	2.27		13.26	16.01	14.85	
SEd (Irrigation levels)	0.10				0.19			
CD (0.05) (Irrigation levels)	0.25				0.47			
SEd (Varieties)	0.11				0.24			
CD (0.05) (Varieties)	0.22				0.52			
SEd Irrigation levels at the same level of varieties	0.21				0.48			
CD (0.05) Irrigation levels at the same level of varieties	0.47				1.06			
SEd varieties at the same level of Irrigation levels	0.20				0.44			
CD (0.05) varieties at the same level of Irrigation levels	0.44				0.96			
Treatments	No of tubers 0-25g (no/ha)				No of tubers 25-75g (no/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	222422	259911	316274	266202	97463	123259	96652	105791
I2	172607	128574	196259	165814	85422	118070	83178	95557
I3	231730	139645	211352	194242	57870	85685	77133	73563
I4	285578	334641	254122	291447	76178	80326	101489	85997

Mean	228084	215693	244502		79233	101835	89613	
SEd (Irrigation levels)	5822				2329			
CD (0.05) (Irrigation levels)	14524				5811			
SEd (Varieties)	5302				2404			
CD (0.05) (Varieties)	11337				5139			
SEd Irrigation levels at the same level of varieties	10605				4807			
CD (0.05) Irrigation levels at the same level of varieties	23851				10724			
SEd varieties at the same level of Irrigation levels	10434				4564			
CD (0.05) varieties at the same level of Irrigation levels	23468				10183			
Treatments	No of tubers >75g (no/ha)				Total no of tubers (no/ha)			
	V1	V2	V3	Mean	V1	V2	V3	Mean
I1	3730	4748	3611	4030	337511	394281	448367	393386
I2	2152	3485	1996	2544	274067	277330	329463	293620
I3	1589	2596	1615	1933	317233	245859	310356	291149
I4	1648	3359	2552	2520	378456	446107	387681	404081
Mean	2280	3547	2444		326817	340894	368967	
SEd (Irrigation levels)	107				6903			
CD (0.05) (Irrigation levels)	266				17220			
SEd (Varieties)	113				7893			
CD (0.05) (Varieties)	242				16877			
SEd Irrigation levels at the same level of varieties	226				15787			
CD (0.05) Irrigation levels at the same level of varieties	503				35009			
SEd varieties at the same level of Irrigation levels	213				14622			
CD (0.05) varieties at the same level of Irrigation levels	475				32426			

## GENET.18: STANDARDIZATION OF PRODUCTION TECHNOLOGY OF BABY POTATOES

Two varieties Kufri Khyati and Kufri Pukhraj were evaluated at Bhubaneswar and Raipur for production technology of baby potatoes.

**Table 433:** Experimental details

Experimental detail/Centre	BHN	RPR
Year	2016-17	2016-17
Design	Split plot	Split plot
Replication	4	4
Plot size (gross) m <sup>2</sup>	9.00	9.00
Spacing (cm)	60 x 20	60 x 20
Planting date	24.11.16	14.11.16
Dehauling date	60 DAP	16.01.17
	75 DAP	01.02.17
	90 DAP	13.01.17
Harvesting date	60 DAP	28.01.17
	75 DAP	12.02.17
	90 DAP	23.01.17
Duration of crop (days)	60 DAP	20.01.17
Variety	75 DAP	04.02.17
	90 DAP	19.02.17
NPK dose (kg/ha)	60 & 75	60, 75 & 90
	V1	K Khyati
	V2	K Pukhraj
	150:80:100	150:100:100

### Treatments

Variety	Seed size	Fertilizers	Irrigation
V1	S <sub>1</sub> : Large size	F <sub>1</sub> : 100% RDF	I <sub>1</sub> : 20mm CPE
	S <sub>2</sub> : Medium size	F <sub>2</sub> : 75% RDF	I <sub>2</sub> : 30mm CPE
V2	S <sub>1</sub> : Large size	F <sub>1</sub> : 100% RDF	I <sub>1</sub> : 20mm CPE
	S <sub>2</sub> : Medium size	F <sub>2</sub> : 75% RDF	I <sub>2</sub> : 30mm CPE

### BHUBANESWAR

Field trial was conducted during 2016-17 consecutively in second year for optimizing production technologies of baby potatoes. Crop emergence (%) was uniform (87.50- 95.25%) and satisfactory in different treatments of variety Kufri Khyati. At 60 days, proportion of baby grade (25-50g) potatoes was maximum in treatment I<sub>2</sub>S<sub>1</sub>F<sub>2</sub>(30mm CPE irrigation level + large seed size + 75% RDF - 42.59 %). Similarly, highest baby grade tuber yield (8.88 t/ha) was also recorded in this treatment, while total tuber yield (23.70 t/ha) was maximum in I<sub>1</sub>S<sub>1</sub>F<sub>1</sub> (20mm CPE irrigation level + large seed size + 100% RDF). At 75 days, percentage of baby grade (25-50g) potatoes was highest in I<sub>1</sub>S<sub>2</sub>F<sub>1</sub> (20mm CPE irrigation level + medium seed size + 100% RDF -37.80 %), whereas, baby grade and total tuber yield was maximum in I<sub>1</sub>S<sub>2</sub>F<sub>1</sub> (20mm CPE irrigation level + medium seed size + 100% RDF - 7.36 t/ha) and I<sub>1</sub>S<sub>1</sub>F<sub>1</sub> (20mm CPE irrigation level + large seed size + 100% RDF - 35.98 t/ha), respectively.

In cv. Kufri Pukhraj, crop emergence was uniform (89.25- 96.00%) and very good in different treatments. Baby grade (25-50g) potatoes proportion was maximum in treatment I<sub>2</sub>S<sub>2</sub>F<sub>1</sub> (30mm CPE irrigation level + medium seed size + 100% RDF - 37.30 %) at 60 days. Baby grade (7.31 t/ha) and total tuber yield (22.70 t/ha) was highest in I<sub>1</sub>S<sub>1</sub>F<sub>1</sub> treatment (20mm CPE irrigation level + large seed size + 100% RDF). At 75 days, proportion of baby grade (25-50g) potatoes was highest in I<sub>2</sub>S<sub>2</sub>F<sub>2</sub>(30mm CPE irrigation level + medium seed size + 75% RDF - 37.09 %), whereas, baby grade (8.65 t/ha) and total tuber yield (24.70 t/ha) was maximum in I<sub>1</sub>S<sub>1</sub>F<sub>1</sub> (20mm CPE irrigation level + large seed size + 100% RDF).

**Table 434:** Plant emergence (%), grade-wise baby tuber (%), grade-wise baby tuber yield & total tuber yield (t/ha) and weight (t/ha) of rotten tubers in 60 & 75 days crop of cultivar **K Khyati**.

60 days crop												
Seed wt (t/ha)												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	5.51	5.60	5.56	S1	5.53	5.58	5.56	F1	4.45	4.40	4.43	
S2	3.35	3.68	3.51	S2	3.57	3.45	3.51	F2	4.65	4.63	4.64	
Mean F	4.43	4.64		Mean I	4.55	4.52		Mean I	4.55	4.52		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
	S1		S2		Factor (Seed size)				0.13	0.04	0.03	
	F1	F2	F1	F2	Factor (Fertilizers)				0.17	0.07	0.05	
I1	5.50	5.55	3.40	3.75	Interaction (Seed size X Fertilizers)				NS	0.10	0.07	
I2	5.51	5.65	3.30	3.61	Factor(Irrigation)				NS	0.07	0.05	
					Interaction (Seed size X Irrigation)				NS	0.10	0.07	
					Interaction (Fertilizers X Irrigation)				NS	0.10	0.07	
					Interaction (Seed size X Fertilizers X Irrigation)				NS	0.14	0.10	
% Emergence												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	92.13	94.13	93.13	S1	94.13	92.13	93.13	F1	90.75	92.88	91.81	
S2	91.50	92.75	92.13	S2	90.50	93.75	92.13	F2	93.88	93.00	93.44	
Mean F	91.81	93.44		Mean I	92.31	92.94		Mean I	92.31	92.94		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
	S1		S2		Factor (Seed size)				NS	1.07	0.75	
	F1	F2	F1	F2	Factor (Fertilizers)				NS	1.17	0.83	
I1	93.75	94.50	87.75	93.25	Interaction (Seed size X Fertilizers)				NS	1.66	1.17	
I2	90.50	93.75	95.25	92.25	Factor(Irrigation)				NS	1.47	1.04	
					Interaction (Seed size X Irrigation)				NS	2.07	1.47	
					Interaction (Fertilizers X Irrigation)				NS	2.07	1.47	
					Interaction (Seed size X Fertilizers X Irrigation)				NS	2.93	2.07	
% Baby tuber 10-25g												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	16.45	23.04	19.74	S1	18.69	20.79	19.74	F1	16.66	18.22	17.44	
S2	18.43	20.99	19.71	S2	17.98	21.44	19.71	F2	20.01	24.02	22.01	
Mean F	17.44	22.01		Mean I	18.34	21.12		Mean I	18.34	21.12		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
	S1		S2		Factor (Seed size)				NS	0.88	0.62	
	F1	F2	F1	F2	Factor (Fertilizers)				1.33	0.55	0.39	
I1	17.26	20.13	16.06	19.90	Interaction (Seed size X Fertilizers)				1.88	0.77	0.55	
I2	15.63	25.95	20.80	22.08	Factor(Irrigation)				1.28	0.59	0.42	
					Interaction (Seed size X Irrigation)				NS	0.83	0.59	
					Interaction (Fertilizers X Irrigation)				NS	0.83	0.59	
					Interaction (Seed size X Fertilizers X Irrigation)				2.57	1.18	0.83	
% Baby tuber 25-50g												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	37.64	39.01	38.33	S1	36.09	40.56	38.33	F1	39.15	34.83	36.99	
S2	36.34	36.57	36.46	S2	37.06	35.85	36.46	F2	34.00	41.59	37.79	
Mean F	36.99	37.79		Mean I	36.57	38.21		Mean I	36.57	38.21		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
	S1		S2		Factor (Seed size)				NS	0.99	0.70	
	F1	F2	F1	F2	Factor (Fertilizers)				NS	0.59	0.42	
I1	36.75	35.43	41.54	32.57	Interaction (Seed size X Fertilizers)				NS	0.83	0.59	
I2	38.53	42.59	31.13	40.58	Factor(Irrigation)				1.14	0.52	0.37	
					Interaction (Seed size X Irrigation)				1.61	0.74	0.52	
					Interaction (Fertilizers X Irrigation)				1.61	0.74	0.52	
					Interaction (Seed size X Fertilizers X Irrigation)				2.27	1.04	0.74	
% Baby tuber >50g												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	

S1	45.92	37.95	41.93	S1	45.22	38.65	41.93	F1	44.20	46.95	45.57	
S2	45.23	42.44	43.84	S2	44.96	42.71	43.84	F2	45.99	34.40	40.19	
Mean F	45.57	40.19		Mean I	45.09	40.68		Mean I	45.09	40.68		
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)			0.80	0.25	0.18			
F1		F2		Factor (Fertilizers)			1.07	0.44	0.31			
I1	45.99	44.44	42.40	47.53	Interaction (Seed size X Fertilizers)			1.51	0.62	0.44		
I2	45.84	31.46	48.07	37.35	Factor(Irrigation)			1.60	0.74	0.52		
					Interaction (Seed size X Irrigation)			2.27	1.04	0.74		
					Interaction (Fertilizers X Irrigation)			2.27	1.04	0.74		
					Interaction (Seed size X Fertilizers X Irrigation)			NS	1.47	1.04		
<b>Yield of baby tubers 10-25g (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	3.71	4.92	4.31	S1	4.25	4.38	4.31	F1	3.50	3.44	3.47	
S2	3.23	3.57	3.40	S2	3.17	3.63	3.40	F2	3.91	4.58	4.24	
Mean F	3.47	4.24		Mean I	3.71	4.01		Mean I	3.71	4.01		
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)			0.82	0.26	0.18			
F1		F2		Factor (Fertilizers)			0.27	0.11	0.08			
I1	4.08	4.41	2.93	3.41	Interaction (Seed size X Fertilizers)			0.38	0.16	0.11		
I2	3.33	5.43	3.54	3.72	Factor(Irrigation)			NS	0.15	0.10		
					Interaction (Seed size X Irrigation)			NS	0.21	0.15		
					Interaction (Fertilizers X Irrigation)			0.45	0.21	0.15		
					Interaction (Seed size X Fertilizers X Irrigation)			0.63	0.29	0.21		
<b>Yield of baby tubers 25-50g (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	8.47	8.34	8.40	S1	8.26	8.55	8.40	F1	8.12	6.76	7.44	
S2	6.41	6.22	6.31	S2	6.55	6.08	6.31	F2	6.69	7.87	7.28	
Mean F	7.44	7.28		Mean I	7.40	7.31		Mean I	7.40	7.31		
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)			0.35	0.11	0.08			
F1		F2		Factor (Fertilizers)			NS	0.11	0.08			
I1	8.72	7.80	7.53	5.58	Interaction (Seed size X Fertilizers)			NS	0.15	0.11		
I2	8.22	8.88	5.30	6.86	Factor(Irrigation)			NS	0.17	0.12		
					Interaction (Seed size X Irrigation)			0.54	0.25	0.17		
					Interaction (Fertilizers X Irrigation)			0.54	0.25	0.17		
					Interaction (Seed size X Fertilizers X Irrigation)			0.76	0.35	0.25		
<b>Yield of baby tubers &gt;50g (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	10.35	8.17	9.26	S1	10.36	8.17	9.26	F1	9.32	8.98	9.15	
S2	7.94	7.24	7.59	S2	7.92	7.26	7.59	F2	8.97	6.44	7.71	
Mean F	9.15	7.71		Mean I	9.14	7.71		Mean I	9.14	7.71		
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)			0.47	0.15	0.11			
F1		F2		Factor (Fertilizers)			0.38	0.15	0.11			
I1	10.94	9.78	7.70	8.15	Interaction (Seed size X Fertilizers)			0.53	0.22	0.15		
I2	9.77	6.56	8.19	6.33	Factor(Irrigation)			0.45	0.21	0.15		
					Interaction (Seed size X Irrigation)			0.64	0.29	0.21		
					Interaction (Fertilizers X Irrigation)			0.64	0.29	0.21		
					Interaction (Seed size X Fertilizers X Irrigation)			NS	0.41	0.29		
<b>Total yield (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	22.53	21.43	21.98	S1	22.86	21.09	21.98	F1	20.94	19.17	20.06	
S2	17.59	17.03	17.31	S2	17.64	16.97	17.31	F2	19.57	18.89	19.23	
Mean F	20.06	19.23		Mean I	20.25	19.03		Mean I	20.25	19.03		
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)			1.10	0.35	0.25			
F1		F2		Factor (Fertilizers)			0.57	0.24	0.17			
I1	23.74	21.99	18.14	17.14	Interaction (Seed size X Fertilizers)			NS	0.33	0.24		
I2	21.32	20.87	17.03	16.91	Factor(Irrigation)			0.73	0.34	0.24		

				Interaction (Seed size X Irrigation)				NS	0.48	0.34	
				Interaction (Fertilizers X Irrigation)				NS	0.48	0.34	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	0.67	0.48	
<b>Weight of rotten tubers (t/ha)</b>											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	0.42	0.28	0.35	S1	0.40	0.29	0.35	F1	0.48	0.37	0.43
S2	0.44	0.44	0.44	S2	0.49	0.39	0.44	F2	0.40	0.31	0.36
Mean F	0.43	0.36		Mean I	0.44	0.34		Mean I	0.44	0.34	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		S1		S2		Factor (Seed size)		0.09	0.03	0.02	
		F1	F2	F1	F2	Factor (Fertilizers)		NS	0.04	0.03	
I1	0.49	0.31	0.48	0.50	Interaction (Seed size X Fertilizers)		NS	0.05	0.04		
I2	0.35	0.24	0.40	0.38	Factor(Irrigation)		0.06	0.03	0.02		
				Interaction (Seed size X Irrigation)				NS	0.04	0.03	
				Interaction (Fertilizers X Irrigation)				NS	0.04	0.03	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	0.05	0.04	
<b>75 days crop</b>											
<b>Seed wt (t/ha)</b>											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	5.62	5.56	5.59	S1	5.60	5.58	5.59	F1	4.58	4.47	4.52
S2	3.43	3.83	3.63	S2	3.71	3.55	3.63	F2	4.74	4.65	4.69
Mean F	4.52	4.69		Mean I	4.66	4.56		Mean I	4.66	4.56	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		S1		S2		Factor (Seed size)		0.11	0.03	0.02	
		F1	F2	F1	F2	Factor (Fertilizers)		0.09	0.04	0.03	
I1	5.65	5.55	3.50	3.93	Interaction (Seed size X Fertilizers)		0.13	0.05	0.04		
I2	5.58	5.58	3.36	3.73	Factor(Irrigation)		NS	0.06	0.04		
				Interaction (Seed size X Irrigation)				NS	0.09	0.06	
				Interaction (Fertilizers X Irrigation)				NS	0.09	0.06	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	0.12	0.09	
<b>% Emergence</b>											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	88.75	92.50	90.63	S1	92.63	88.63	90.63	F1	84.13	91.50	87.81
S2	86.88	95.75	91.31	S2	87.88	94.75	91.31	F2	96.38	91.88	94.13
Mean F	87.81	94.13		Mean I	90.25	91.69		Mean I	90.25	91.69	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		S1		S2		Factor (Seed size)		NS	1.28	0.91	
		F1	F2	F1	F2	Factor (Fertilizers)		4.76	1.95	1.38	
I1	90.00	95.25	78.25	97.50	Interaction (Seed size X Fertilizers)		NS	2.76	1.95		
I2	87.50	89.75	95.50	94.00	Factor(Irrigation)		NS	1.37	0.97		
				Interaction (Seed size X Irrigation)				4.22	1.94	1.37	
				Interaction (Fertilizers X Irrigation)				4.22	1.94	1.37	
				Interaction (Seed size X Fertilizers X Irrigation)				5.96	2.74	1.94	
<b>% Baby tuber 10-25g</b>											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	19.72	19.52	19.62	S1	19.28	19.96	19.62	F1	16.02	18.49	17.26
S2	14.80	19.88	17.34	S2	16.28	18.40	17.34	F2	19.53	19.87	19.70
Mean F	17.26	19.70		Mean I	17.78	19.18		Mean I	17.78	19.18	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		S1		S2		Factor (Seed size)		1.77	0.56	0.40	
		F1	F2	F1	F2	Factor (Fertilizers)		0.77	0.31	0.22	
I1	19.01	19.54	13.04	19.52	Interaction (Seed size X Fertilizers)		1.08	0.44	0.31		
I2	20.43	19.50	16.56	20.24	Factor(Irrigation)		0.68	0.31	0.22		
				Interaction (Seed size X Irrigation)				0.96	0.44	0.31	
				Interaction (Fertilizers X Irrigation)				0.96	0.44	0.31	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	0.62	0.44	
<b>% Baby tuber 25-50g</b>											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	28.90	32.87	30.89	S1	29.61	32.17	30.89	F1	33.42	33.02	33.22

S2	37.53	36.20	36.87	S2	37.40	36.33	36.87	F2	33.60	35.48	34.54	
Mean F	33.22	34.54		Mean I	33.51	34.25		Mean I	33.51	34.25		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)				0.44	0.14	0.10		
F1	F2	F1	F2	Factor (Fertilizers)				NS	0.65	0.46		
I1	29.04	30.19	37.80	37.01	Interaction (Seed size X Fertilizers)				2.25	0.92	0.65	
I2	28.77	35.56	37.27	35.39	Factor(Irrigation)				0.70	0.32	0.23	
				Interaction (Seed size X Irrigation)				0.99	0.46	0.32		
				Interaction (Fertilizers X Irrigation)				0.99	0.46	0.32		
				Interaction (Seed size X Fertilizers X Irrigation)				1.41	0.65	0.46		
<b>% Baby tuber &gt;50g</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	51.38	47.61	49.49	S1	51.11	47.87	49.49	F1	50.56	48.49	49.53	
S2	47.67	43.92	45.80	S2	46.32	45.27	45.80	F2	46.87	44.66	45.76	
Mean F	49.53	45.76		Mean I	48.72	46.57		Mean I	48.72	46.57		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)				2.04	0.64	0.46		
F1	F2	F1	F2	Factor (Fertilizers)				1.22	0.50	0.35		
I1	51.96	50.27	49.17	43.47	Interaction (Seed size X Fertilizers)				1.73	0.71	0.50	
I2	50.81	44.94	46.17	44.38	Factor(Irrigation)				1.09	0.50	0.36	
				Interaction (Seed size X Irrigation)				1.55	0.71	0.50		
				Interaction (Fertilizers X Irrigation)				NS	0.71	0.50		
				Interaction (Seed size X Fertilizers X Irrigation)				2.19	1.01	0.71		
<b>Yield of baby tubers 10-25g (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	4.45	4.08	4.27	S1	4.45	4.08	4.27	F1	3.57	3.71	3.64	
S2	2.82	3.61	3.22	S2	3.09	3.34	3.22	F2	3.98	3.71	3.85	
Mean F	3.64	3.85		Mean I	3.77	3.71		Mean I	3.77	3.71		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)				0.46	0.15	0.10		
F1	F2	F1	F2	Factor (Fertilizers)				0.19	0.08	0.06		
I1	4.60	4.31	2.54	3.64	Interaction (Seed size X Fertilizers)				0.27	0.11	0.08	
I2	4.31	3.86	3.11	3.57	Factor(Irrigation)				NS	0.09	0.06	
				Interaction (Seed size X Irrigation)				0.26	0.12	0.09		
				Interaction (Fertilizers X Irrigation)				0.26	0.12	0.09		
				Interaction (Seed size X Fertilizers X Irrigation)				NS	0.17	0.12		
<b>Yield of baby tubers 25-50g (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	6.54	6.85	6.69	S1	6.84	6.55	6.69	F1	7.19	6.53	6.86	
S2	7.18	6.57	6.87	S2	7.12	6.62	6.87	F2	6.77	6.64	6.71	
Mean F	6.86	6.71		Mean I	6.98	6.59		Mean I	6.98	6.59		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)				NS	0.13	0.09		
F1	F2	F1	F2	Factor (Fertilizers)				NS	0.13	0.09		
I1	7.02	6.66	7.36	6.89	Interaction (Seed size X Fertilizers)				0.46	0.19	0.13	
I2	6.07	7.04	6.99	6.25	Factor(Irrigation)				0.24	0.11	0.08	
				Interaction (Seed size X Irrigation)				NS	0.16	0.11		
				Interaction (Fertilizers X Irrigation)				0.35	0.16	0.11		
				Interaction (Seed size X Fertilizers X Irrigation)				0.49	0.22	0.16		
<b>Yield of baby tubers &gt;50g (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	11.69	10.01	10.85	S1	11.86	9.84	10.85	F1	11.12	9.74	10.43	
S2	9.16	7.98	8.57	S2	8.86	8.29	8.57	F2	9.60	8.40	9.00	
Mean F	10.43	9.00		Mean I	10.36	9.07		Mean I	10.36	9.07		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)				0.57	0.18	0.13		
F1	F2	F1	F2	Factor (Fertilizers)				0.48	0.20	0.14		
I1	12.62	11.09	9.61	8.11	Interaction (Seed size X Fertilizers)				NS	0.28	0.20	
I2	10.76	8.93	8.71	7.86	Factor(Irrigation)				0.28	0.13	0.09	
				Interaction (Seed size X Irrigation)				0.40	0.18	0.13		

				Interaction (Fertilizers X Irrigation)				NS	0.18	0.13	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	0.26	0.18	
<b>Total yield (t/ha)</b>											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	33.66	31.17	32.42	S1	34.42	30.41	32.42	F1	32.62	29.49	31.05
S2	28.45	26.91	27.68	S2	28.40	26.96	27.68	F2	30.20	27.88	29.04
Mean F	31.05	29.04		Mean I	31.41	28.68		Mean I	31.41	28.68	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		S1		S2		Factor (Seed size)		NS	1.60	1.13	
		F1	F2	F1	F2	Factor (Fertilizers)		1.31	0.54	0.38	
I1	35.98	32.86	29.26	27.55	Interaction (Seed size X Fertilizers)		NS	0.76	0.54		
I2	31.34	29.49	27.63	26.28	Factor(Irrigation)		1.20	0.55	0.39		
				Interaction (Seed size X Irrigation)				1.70	0.78	0.55	
				Interaction (Fertilizers X Irrigation)				NS	0.78	0.55	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	1.11	0.78	
<b>Weight of rotten tubers (t/ha)</b>											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	0.42	0.34	0.38	S1	0.43	0.33	0.38	F1	0.48	0.38	0.43
S2	0.44	0.43	0.44	S2	0.47	0.40	0.44	F2	0.42	0.34	0.38
Mean F	0.43	0.38		Mean I	0.45	0.36		Mean I	0.45	0.36	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		S1		S2		Factor (Seed size)		NS	0.02	0.02	
		F1	F2	F1	F2	Factor (Fertilizers)		NS	0.04	0.03	
I1	0.49	0.36	0.47	0.48	Interaction (Seed size X Fertilizers)		NS	0.06	0.04		
I2	0.34	0.31	0.42	0.38	Factor(Irrigation)		0.03	0.02	0.01		
				Interaction (Seed size X Irrigation)				NS	0.02	0.02	
				Interaction (Fertilizers X Irrigation)				NS	0.02	0.02	
				Interaction (Seed size X Fertilizers X Irrigation)				0.07	0.03	0.02	

**Table 435:** Plant emergence (%), grade-wise baby tuber (%), grade-wise baby tuber yield & total tuber yield (t/ha) and weight (t/ha) of rotten tubers in 60 & 75 days crop of cultivar **K Pukhraj**.

<b>60 days crop</b>											
<b>% Seed wt (t/ha)</b>											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	5.75	5.79	5.77	S1	5.68	5.87	5.77	F1	4.54	4.64	4.59
S2	3.42	3.44	3.43	S2	3.37	3.49	3.43	F2	4.52	4.72	4.62
Mean F	4.59	4.62		Mean I	4.53	4.68		Mean I	4.53	4.68	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		S1		S2		Factor (Seed size)		0.16	0.05	0.04	
		F1	F2	F1	F2	Factor (Fertilizers)		NS	0.05	0.04	
I1	5.68	5.68	3.39	3.36	Interaction (Seed size X Fertilizers)		NS	0.07	0.05		
I2	5.83	5.91	3.46	3.53	Factor(Irrigation)		NS	0.10	0.07		
				Interaction (Seed size X Irrigation)				NS	0.14	0.10	
				Interaction (Fertilizers X Irrigation)				NS	0.14	0.10	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	0.19	0.14	
<b>% Emergence</b>											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	91.75	94.38	93.06	S1	94.25	91.88	93.06	F1	94.50	92.13	93.31
S2	94.88	94.75	94.81	S2	94.13	95.50	94.81	F2	93.88	95.25	94.56
Mean F	93.31	94.56		Mean I	94.19	93.69		Mean I	94.19	93.69	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		S1		S2		Factor (Seed size)		1.25	0.40	0.28	
		F1	F2	F1	F2	Factor (Fertilizers)		NS	1.42	1.00	
I1	94.25	94.25	94.75	93.50	Interaction (Seed size X Fertilizers)		NS	2.00	1.42		
I2	89.25	94.50	95.00	96.00	Factor(Irrigation)		NS	1.16	0.82		
				Interaction (Seed size X Irrigation)				NS	1.64	1.16	
				Interaction (Fertilizers X Irrigation)				NS	1.64	1.16	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	2.31	1.64	
<b>% Baby tuber 10-25g</b>											



Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	17.74	20.10	18.92	S1	17.11	20.73	18.92	F1	17.83	17.49	17.66
S2	17.58	18.92	18.25	S2	19.91	16.59	18.25	F2	19.19	19.83	19.51
Mean F	17.66	19.51		Mean I	18.51	18.66		Mean I	18.51	18.66	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
S1		S2		Factor (Seed size)				NS	0.49	0.35	
F1	F2	F1	F2	Factor (Fertilizers)				1.06	0.43	0.31	
I1	16.27	17.94	19.38	20.44	Interaction (Seed size X Fertilizers)				NS	0.61	0.43
I2	19.20	22.26	15.79	17.40	Factor(Irrigation)				NS	0.36	0.25
				Interaction (Seed size X Irrigation)				1.10	0.50	0.36	
				Interaction (Fertilizers X Irrigation)				NS	0.50	0.36	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	0.71	0.50	
% Baby tuber 25-50g											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	32.34	32.96	32.65	S1	33.69	31.60	32.65	F1	31.60	34.90	33.25
S2	34.15	33.52	33.84	S2	32.43	35.24	33.84	F2	34.53	31.95	33.24
Mean F	33.25	33.24		Mean I	33.06	33.42		Mean I	33.06	33.42	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
S1		S2		Factor (Seed size)				NS	0.58	0.41	
F1	F2	F1	F2	Factor (Fertilizers)				NS	0.82	0.58	
I1	32.19	35.20	31.01	33.86	Interaction (Seed size X Fertilizers)				NS	1.16	0.82
I2	32.49	30.72	37.30	33.18	Factor(Irrigation)				NS	0.54	0.38
				Interaction (Seed size X Irrigation)				1.66	0.76	0.54	
				Interaction (Fertilizers X Irrigation)				1.66	0.76	0.54	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	1.08	0.76	
% Baby tuber >50g											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	49.92	46.95	48.43	S1	49.20	47.67	48.43	F1	50.58	47.61	49.09
S2	48.26	47.56	47.91	S2	47.66	48.17	47.91	F2	46.28	48.23	47.25
Mean F	49.09	47.25		Mean I	48.43	47.92		Mean I	48.43	47.92	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
S1		S2		Factor (Seed size)				NS	0.66	0.47	
F1	F2	F1	F2	Factor (Fertilizers)				NS	0.91	0.64	
I1	51.54	46.87	49.62	45.70	Interaction (Seed size X Fertilizers)				NS	1.28	0.91
I2	48.31	47.03	46.91	49.43	Factor(Irrigation)				NS	0.60	0.43
				Interaction (Seed size X Irrigation)				NS	0.85	0.60	
				Interaction (Fertilizers X Irrigation)				1.86	0.85	0.60	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	1.20	0.85	
Yield of baby tubers 10-25g (t/ha)											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	3.83	4.03	3.93	S1	3.67	4.20	3.93	F1	3.73	3.45	3.59
S2	3.35	3.33	3.34	S2	3.76	2.92	3.34	F2	3.70	3.66	3.68
Mean F	3.59	3.68		Mean I	3.71	3.56		Mean I	3.71	3.56	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
S1		S2		Factor (Seed size)				0.40	0.13	0.09	
F1	F2	F1	F2	Factor (Fertilizers)				NS	0.12	0.09	
I1	3.69	3.65	3.78	3.75	Interaction (Seed size X Fertilizers)				NS	0.17	0.12
I2	3.98	4.42	2.93	2.91	Factor(Irrigation)				NS	0.08	0.05
				Interaction (Seed size X Irrigation)				0.23	0.11	0.08	
				Interaction (Fertilizers X Irrigation)				NS	0.11	0.08	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	0.15	0.11	
Yield of baby tubers 25-50g (t/ha)											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	7.02	6.64	6.83	S1	7.24	6.42	6.83	F1	6.68	6.81	6.74
S2	6.46	5.88	6.17	S2	6.13	6.22	6.17	F2	6.68	5.83	6.26
Mean F	6.74	6.26		Mean I	6.68	6.32		Mean I	6.68	6.32	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
S1		S2		Factor (Seed size)				0.39	0.12	0.09	
F1	F2	F1	F2	Factor (Fertilizers)				0.39	0.16	0.11	

I1	7.31	7.16	6.04	6.21	Interaction (Seed size X Fertilizers)			NS	0.23	0.16		
I2	6.74	6.11	6.88	5.56	Factor(Irrigation)			0.27	0.12	0.09		
					Interaction (Seed size X Irrigation)			0.38	0.17	0.12		
					Interaction (Fertilizers X Irrigation)			0.38	0.17	0.12		
					Interaction (Seed size X Fertilizers X Irrigation)			NS	0.25	0.17		
<b>Yield of baby tubers &gt;50g (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	10.86	9.46	10.16	S1	10.64	9.69	10.16	F1	10.70	9.34	10.02	
S2	9.17	8.36	8.77	S2	9.04	8.50	8.77	F2	8.98	8.84	8.91	
Mean F	10.02	8.91		Mean I	9.84	9.09		Mean I	9.84	9.09		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
		S1		S2		Factor (Seed size)		0.39	0.12	0.09		
		F1	F2	F1	F2	Factor (Fertilizers)		0.62	0.25	0.18		
I1	11.71	9.57	9.69	8.39	Interaction (Seed size X Fertilizers)			NS	0.36	0.25		
I2	10.02	9.35	8.66	8.34	Factor(Irrigation)			0.37	0.17	0.12		
					Interaction (Seed size X Irrigation)			NS	0.24	0.17		
					Interaction (Fertilizers X Irrigation)			0.52	0.24	0.17		
					Interaction (Seed size X Fertilizers X Irrigation)			NS	0.34	0.24		
<b>Total yield (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	21.72	20.12	20.92	S1	21.54	20.30	20.92	F1	21.10	19.60	20.35	
S2	18.99	17.57	18.28	S2	18.93	17.63	18.28	F2	19.36	18.34	18.85	
Mean F	20.35	18.85		Mean I	20.23	18.97		Mean I	20.23	18.97		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
		S1		S2		Factor (Seed size)		0.63	0.20	0.14		
		F1	F2	F1	F2	Factor (Fertilizers)		0.72	0.29	0.21		
I1	22.70	20.37	19.51	18.35	Interaction (Seed size X Fertilizers)			NS	0.41	0.29		
I2	20.74	19.87	18.47	16.80	Factor(Irrigation)			0.45	0.21	0.15		
					Interaction (Seed size X Irrigation)			NS	0.29	0.21		
					Interaction (Fertilizers X Irrigation)			NS	0.29	0.21		
					Interaction (Seed size X Fertilizers X Irrigation)			0.89	0.41	0.29		
<b>Weight of rotten tubers (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	0.55	0.54	0.54	S1	0.54	0.55	0.54	F1	0.54	0.58	0.56	
S2	0.57	0.53	0.55	S2	0.56	0.54	0.55	F2	0.55	0.52	0.53	
Mean F	0.56	0.53		Mean I	0.55	0.55		Mean I	0.55	0.55		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
		S1		S2		Factor (Seed size)		NS	0.04	0.03		
		F1	F2	F1	F2	Factor (Fertilizers)		NS	0.02	0.02		
I1	0.55	0.52	0.53	0.58	Interaction (Seed size X Fertilizers)			NS	0.03	0.02		
I2	0.55	0.55	0.61	0.48	Factor(Irrigation)			NS	0.03	0.02		
					Interaction (Seed size X Irrigation)			NS	0.04	0.03		
					Interaction (Fertilizers X Irrigation)			NS	0.04	0.03		
					Interaction (Seed size X Fertilizers X Irrigation)			NS	0.06	0.04		
<b>75 days crop</b>												
<b>Seed wt (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	5.72	5.79	5.76	S1	5.77	5.74	5.76	F1	4.59	4.58	4.58	
S2	3.45	3.73	3.59	S2	3.47	3.70	3.59	F2	4.65	4.87	4.76	
Mean F	4.58	4.76		Mean I	4.62	4.72		Mean I	4.62	4.72		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
		S1		S2		Factor (Seed size)		0.24	0.08	0.05		
		F1	F2	F1	F2	Factor (Fertilizers)		NS	0.10	0.07		
I1	5.77	5.77	3.41	3.54	Interaction (Seed size X Fertilizers)			NS	0.13	0.10		
I2	5.67	5.82	3.49	3.91	Factor(Irrigation)			NS	0.07	0.05		
					Interaction (Seed size X Irrigation)			NS	0.09	0.07		
					Interaction (Fertilizers X Irrigation)			NS	0.09	0.07		
					Interaction (Seed size X Fertilizers X Irrigation)			NS	0.13	0.09		
<b>% Emergence</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				

	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	94.75	96.38	95.56	S1	95.38	95.75	95.56	F1	94.63	95.25	94.94
S2	95.13	94.38	94.75	S2	95.63	93.88	94.75	F2	96.38	94.38	95.38
Mean F	94.94	95.38		Mean I	95.50	94.81		Mean I	95.50	94.81	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
S1		S2		Factor (Seed size)				NS	1.02	0.72	
F1	F2	F1	F2	Factor (Fertilizers)				NS	0.96	0.68	
I1	94.25	96.50	95.00	96.25	Interaction (Seed size X Fertilizers)				NS	1.35	0.96
I2	95.25	96.25	95.25	92.50	Factor(Irrigation)				NS	1.34	0.95
				Interaction (Seed size X Irrigation)				NS	1.89	1.34	
				Interaction (Fertilizers X Irrigation)				NS	1.89	1.34	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	2.68	1.89	
<b>% Baby tuber 10-25g</b>											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	19.89	20.67	20.28	S1	18.31	22.25	20.28	F1	19.05	20.61	19.83
S2	19.77	19.30	19.54	S2	20.24	18.83	19.54	F2	19.49	20.48	19.99
Mean F	19.83	19.99		Mean I	19.27	20.54		Mean I	19.27	20.54	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
S1		S2		Factor (Seed size)				NS	0.43	0.30	
F1	F2	F1	F2	Factor (Fertilizers)				NS	0.49	0.35	
I1	17.75	18.86	20.36	20.13	Interaction (Seed size X Fertilizers)				NS	0.69	0.49
I2	22.02	22.48	19.19	18.47	Factor(Irrigation)				NS	0.62	0.44
				Interaction (Seed size X Irrigation)				1.91	0.88	0.62	
				Interaction (Fertilizers X Irrigation)				NS	0.88	0.62	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	1.24	0.88	
<b>% Baby tuber 25-50g</b>											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	34.46	30.09	32.27	S1	32.80	31.75	32.27	F1	35.73	32.77	34.25
S2	34.04	36.76	35.40	S2	36.39	34.41	35.40	F2	33.46	33.39	33.42
Mean F	34.25	33.42		Mean I	34.59	33.08		Mean I	34.59	33.08	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
S1		S2		Factor (Seed size)				1.39	0.44	0.31	
F1	F2	F1	F2	Factor (Fertilizers)				NS	0.60	0.42	
I1	35.11	30.50	36.35	36.43	Interaction (Seed size X Fertilizers)				2.06	0.84	0.60
I2	33.81	29.68	31.73	37.09	Factor(Irrigation)				1.28	0.59	0.42
				Interaction (Seed size X Irrigation)				NS	0.83	0.59	
				Interaction (Fertilizers X Irrigation)				1.81	0.83	0.59	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	1.18	0.83	
<b>% Baby tuber &gt;50g</b>											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	45.41	49.37	47.39	S1	49.02	45.75	47.39	F1	45.22	46.37	45.80
S2	46.19	43.94	45.06	S2	43.37	46.76	45.06	F2	47.17	46.14	46.65
Mean F	45.80	46.65		Mean I	46.20	46.25		Mean I	46.20	46.25	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
S1		S2		Factor (Seed size)				NS	1.60	1.13	
F1	F2	F1	F2	Factor (Fertilizers)				NS	1.00	0.71	
I1	47.14	50.90	43.30	43.45	Interaction (Seed size X Fertilizers)				3.45	1.41	1.00
I2	43.67	47.84	49.08	44.43	Factor(Irrigation)				NS	1.17	0.83
				Interaction (Seed size X Irrigation)				3.60	1.65	1.17	
				Interaction (Fertilizers X Irrigation)				NS	1.65	1.17	
				Interaction (Seed size X Fertilizers X Irrigation)				NS	2.34	1.65	
<b>Yield of baby tubers 10-25g (t/ha)</b>											
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation			
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F
S1	4.69	4.58	4.63	S1	4.31	4.96	4.63	F1	4.30	4.40	4.35
S2	4.01	3.53	3.77	S2	4.04	3.50	3.77	F2	4.05	4.06	4.05
Mean F	4.35	4.05		Mean I	4.17	4.23		Mean I	4.17	4.23	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
S1		S2		Factor (Seed size)				0.21	0.07	0.05	
F1	F2	F1	F2	Factor (Fertilizers)				0.23	0.10	0.07	
I1	4.38	4.24	4.22	3.86	Interaction (Seed size X Fertilizers)				NS	0.14	0.10

I2	5.00	4.92	3.80	3.20	Factor(Irrigation)	NS	0.13	0.09				
					Interaction (Seed size X Irrigation)	0.40	0.19	0.13				
					Interaction (Fertilizers X Irrigation)	NS	0.19	0.13				
					Interaction (Seed size X Fertilizers X Irrigation)	NS	0.26	0.19				
<b>Yield of baby tubers 25-50g (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	8.16	6.67	7.42	S1	7.75	7.08	7.42	F1	8.10	6.98	7.54	
S2	6.92	6.69	6.81	S2	7.27	6.34	6.81	F2	6.92	6.45	6.68	
Mean F	7.54	6.68		Mean I	7.51	6.71		Mean I	7.51	6.71		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)				0.54	0.17	0.12		
F1	F2	F1	F2	Factor (Fertilizers)				0.26	0.11	0.08		
I1	8.65	6.86	7.56	6.99	Interaction (Seed size X Fertilizers)				0.36	0.15	0.11	
I2	7.68	6.49	6.28	6.40	Factor(Irrigation)				0.33	0.15	0.11	
					Interaction (Seed size X Irrigation)				NS	0.22	0.15	
					Interaction (Fertilizers X Irrigation)				NS	0.22	0.15	
					Interaction (Seed size X Fertilizers X Irrigation)				NS	0.31	0.22	
<b>Yield of baby tubers &gt;50g (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	10.78	10.92	10.85	S1	11.53	10.18	10.85	F1	10.34	9.84	10.09	
S2	9.39	8.08	8.74	S2	8.70	8.78	8.74	F2	9.89	9.11	9.50	
Mean F	10.09	9.50		Mean I	10.11	9.48		Mean I	10.11	9.48		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)				1.29	0.41	0.29		
F1	F2	F1	F2	Factor (Fertilizers)				0.45	0.19	0.13		
I1	11.68	11.38	9.00	8.40	Interaction (Seed size X Fertilizers)				0.64	0.26	0.19	
I2	9.89	10.46	9.79	7.76	Factor(Irrigation)				0.58	0.27	0.19	
					Interaction (Seed size X Irrigation)				0.82	0.38	0.27	
					Interaction (Fertilizers X Irrigation)				NS	0.38	0.27	
					Interaction (Seed size X Fertilizers X Irrigation)				NS	0.53	0.38	
<b>Total yield (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	23.63	22.17	22.90	S1	23.59	22.22	22.90	F1	22.74	21.22	21.98	
S2	20.32	18.30	19.31	S2	20.00	18.61	19.31	F2	20.86	19.61	20.23	
Mean F	21.98	20.23		Mean I	21.80	20.42		Mean I	21.80	20.42		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)				1.71	0.54	0.38		
F1	F2	F1	F2	Factor (Fertilizers)				0.65	0.27	0.19		
I1	24.70	22.48	20.77	19.24	Interaction (Seed size X Fertilizers)				NS	0.38	0.27	
I2	22.56	21.87	19.87	17.35	Factor(Irrigation)				0.75	0.34	0.24	
					Interaction (Seed size X Irrigation)				NS	0.49	0.34	
					Interaction (Fertilizers X Irrigation)				NS	0.49	0.34	
					Interaction (Seed size X Fertilizers X Irrigation)				NS	0.69	0.49	
<b>Weight of rotten tubers (t/ha)</b>												
Seed size X Fertilizers				Seed size X Irrigation				Fertilizers X Irrigation				
	F1	F2	Mean S		I1	I2	Mean S		I1	I2	Mean F	
S1	0.53	0.45	0.49	S1	0.52	0.46	0.49	F1	0.51	0.49	0.50	
S2	0.47	0.47	0.47	S2	0.47	0.47	0.47	F2	0.48	0.44	0.46	
Mean F	0.50	0.46		Mean I	0.50	0.46		Mean I	0.50	0.46		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
S1		S2		Factor (Seed size)				NS	0.03	0.02		
F1	F2	F1	F2	Factor (Fertilizers)				NS	0.03	0.02		
I1	0.60	0.45	0.42	0.52	Interaction (Seed size X Fertilizers)				NS	0.04	0.03	
I2	0.47	0.46	0.52	0.42	Factor(Irrigation)				NS	0.04	0.03	
					Interaction (Seed size X Irrigation)				NS	0.06	0.04	
					Interaction (Fertilizers X Irrigation)				NS	0.06	0.04	
					Interaction (Seed size X Fertilizers X Irrigation)				0.17	0.08	0.06	

## RAIPUR

Field experiment was carried out during 2016-17 in second year for developing production technologies of baby potatoes. Crop emergence (%) was uniform (90.60- 95.00%) and very good in different treatments of variety Kufri Khyati. At 60 days, proportion of baby grade (25-50g) potatoes was highest in treatment I<sub>2</sub>S<sub>1</sub>F<sub>2</sub>(30mm CPE irrigation level + large seed size + 75% RDF - 36.03 %). Similarly, highest baby grade tuber yield (3.98 t/ha) was also recorded in this treatment, while total tuber yield (13.51 t/ha) was maximum in I<sub>1</sub>S<sub>1</sub>F<sub>1</sub> (20mm CPE irrigation level + large seed size + 100% RDF). At 75 days, percentage of baby grade (25-50g) potatoes was highest in I<sub>2</sub>S<sub>1</sub>F<sub>1</sub> (30mm CPE irrigation level + large seed size + 100% RDF - 29.05 %) and likewise, baby grade yield (4.90 t/ha) was also maximum in this treatment. Total tuber yield was highest in I<sub>1</sub>S<sub>1</sub>F<sub>1</sub> (20mm CPE irrigation level + large seed size + 100% RDF - 19.20 t/ha). At 90 days, baby grade (25-50g) potato percentage was highest in treatment I<sub>2</sub>S<sub>1</sub>F<sub>1</sub>(30mm CPE irrigation level + large seed size + 100% RDF - 16.36%). Similarly, maximum baby grade tuber yield (3.05 t/ha) was also observed in this treatment, whereas highest total tuber yield (23.50 t/ha) was observed in I<sub>1</sub>S<sub>1</sub>F<sub>1</sub> (20mm CPE irrigation level + large seed size + 100% RDF).

In cv. Kufri Pukhraj, crop emergence (%) was uniform (89.17- 95.00%) and quite satisfactory in different treatments and baby grade (25-50g) potatoes percent was maximum in treatment I<sub>2</sub>S<sub>2</sub>F<sub>1</sub> (30mm CPE irrigation level + medium seed size + 100% RDF - 36.96 %) at 60 days. Baby grade (4.88 t/ha) and total tuber yield (15.20 t/ha) was highest in I<sub>2</sub>S<sub>1</sub>F<sub>1</sub> (30mm CPE irrigation level + large seed size + 100% RDF) and I<sub>1</sub>S<sub>1</sub>F<sub>1</sub> treatment (20mm CPE irrigation level + large seed size + 100% RDF), respectively. At 75 days, proportion of baby grade (25-50g) potatoes was highest in I<sub>2</sub>S<sub>1</sub>F<sub>2</sub> (30mm CPE irrigation level + large seed size + 75% RDF - 28.34 %), while, baby grade yield (5.12 t/ha) and total tuber yield (21.79 t/ha) was maximum in I<sub>2</sub>S<sub>1</sub>F<sub>1</sub> (30mm CPE irrigation level + large seed size + 100% RDF) and I<sub>1</sub>S<sub>1</sub>F<sub>1</sub>treatments(20mm CPE irrigation level + large seed size + 100% RDF), respectively. At 90 days, percentage of baby grade (25-50g) potatoes was maximum in treatment I<sub>2</sub>S<sub>1</sub>F<sub>2</sub> (30mm CPE irrigation level + large seed size + 75% RDF - 23.47 %). Highest baby grade tuber yield (5.56 t/ha) and total tuber yield (26.24 t/ha) was found in I<sub>2</sub>S<sub>2</sub>F<sub>1</sub> (30mm CPE irrigation level + medium seed size + 100% RDF) and I<sub>1</sub>S<sub>1</sub>F<sub>1</sub>treatments (20mm CPE irrigation level + large seed size + 100% RDF), respectively

**Table 436:** Plant emergence (%), grade-wise baby tuber (%), grade-wise baby tuber yield & total tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 60, 75 & 90 days crop of cultivar **K Khyati**.

60 days crop												
Seed Wt (t/ha)												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	5.32	6.23	5.77	I1	5.86	5.69	5.77	F1	5.52	5.39	5.45	
I2	5.59	5.44	5.51	I2	5.88	5.14	5.51	F2	6.22	5.45	5.83	
Mean F	5.45	5.83		Mean S	5.87	5.42		Mean S	5.87	5.42		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
	I1		I2		Factor (Irrigation)				NS	0.31	0.22	
	F1	F2	F1	F2	Factor (Fertilizers)				NS	0.20	0.14	
S1	4.97	6.74	6.06	5.70	Interaction (Irrigation X Fertilizer)				NS	0.29	0.20	
S2	5.66	5.72	5.11	5.17	Factor (Seed size)				0.25	0.11	0.08	
					Interaction (Irrigation X Seed size)				0.35	0.15	0.11	
					Interaction (Fertilizer X Seed size)				0.35	0.15	0.11	
					Interaction (Irrigation X Fertilizer X Seed size)				0.50	0.22	0.15	
% Emergence												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	93.33	94.17	93.75	I1	94.17	93.33	93.75	F1	94.58	93.75	94.17	
I2	95.00	91.67	93.33	I2	92.50	94.17	93.33	F2	92.08	93.75	92.92	
Mean F	94.17	92.92		Mean S	93.33	93.75		Mean S	93.33	93.75		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
	I1		I2		Factor (Irrigation)				NS	0.55	0.39	
	F1	F2	F1	F2	Factor (Fertilizers)				NS	1.79	1.27	
S1	94.17	94.17	95.00	90.00	Interaction (Irrigation X Fertilizer)				NS	2.53	1.79	
S2	92.50	94.17	95.00	93.33	Factor (Seed size)				NS	1.86	1.32	
					Interaction (Irrigation X Seed size)				NS	2.64	1.86	
					Interaction (Fertilizer X Seed size)				NS	2.64	1.86	
					Interaction (Irrigation X Fertilizer X Seed size)				NS	3.73	2.64	
% Baby tuber 10-25g												

Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	21.69	21.24	21.47	I1	22.27	20.66	21.47	F1	26.33	20.13	23.23
I2	24.77	26.21	25.49	I2	25.48	25.50	25.49	F2	21.42	26.04	23.73
Mean F	23.23	23.73		Mean S	23.87	23.08		Mean S	23.87	23.08	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
I1		I2		Factor (Irrigation)				NS	1.49	1.05	
F1	F2	F1	F2	Factor (Fertilizers)				NS	1.34	0.95	
S1	26.56	17.98	26.11	24.85	Interaction (Irrigation X Fertilizer)				NS	1.90	1.34
S2	16.82	24.50	23.43	27.57	Factor (Seed size)				NS	1.32	0.94
				Interaction (Irrigation X Seed size)				NS	1.87	1.32	
				Interaction (Fertilizer X Seed size)				4.31	1.87	1.32	
				Interaction (Irrigation X Fertilizer X Seed size)				NS	2.64	1.87	
% Baby tuber 25-50g											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	23.16	27.29	25.23	I1	23.89	26.57	25.23	F1	20.23	29.50	24.86
I2	26.56	28.99	27.78	I2	27.82	27.73	27.78	F2	31.48	24.80	28.14
Mean F	24.86	28.14		Mean S	25.85	27.15		Mean S	25.85	27.15	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
I1		I2		Factor (Irrigation)				1.62	0.37	0.26	
F1	F2	F1	F2	Factor (Fertilizers)				1.19	0.43	0.30	
S1	20.84	26.94	19.61	36.03	Interaction (Irrigation X Fertilizer)				NS	0.61	0.43
S2	25.49	27.64	33.51	21.96	Factor (Seed size)				NS	1.03	0.73
				Interaction (Irrigation X Seed size)				NS	1.46	1.03	
				Interaction (Fertilizer X Seed size)				3.36	1.46	1.03	
				Interaction (Irrigation X Fertilizer X Seed size)				4.76	2.07	1.46	
% Baby tuber >50g											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	52.52	48.45	50.48	I1	51.30	49.66	50.48	F1	50.06	47.53	48.79
I2	45.07	39.73	42.40	I2	41.59	43.21	42.40	F2	42.83	45.34	44.09
Mean F	48.79	44.09		Mean S	46.45	46.44		Mean S	46.45	46.44	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
I1		I2		Factor (Irrigation)				7.27	1.67	1.18	
F1	F2	F1	F2	Factor (Fertilizers)				4.05	1.47	1.04	
S1	49.76	52.84	50.36	32.83	Interaction (Irrigation X Fertilizer)				NS	2.08	1.47
S2	55.27	44.05	39.79	46.63	Factor (Seed size)				NS	0.67	0.47
				Interaction (Irrigation X Seed size)				2.17	0.94	0.67	
				Interaction (Fertilizer X Seed size)				2.17	0.94	0.67	
				Interaction (Irrigation X Fertilizer X Seed size)				3.08	1.34	0.94	
Yield of baby tubers 10-25g (t/ha)											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	2.85	2.57	2.71	I1	2.88	2.54	2.71	F1	3.29	2.34	2.82
I2	2.79	2.84	2.82	I2	2.90	2.74	2.82	F2	2.48	2.93	2.71
Mean F	2.82	2.71		Mean S	2.89	2.64		Mean S	2.89	2.64	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
I1		I2		Factor (Irrigation)				NS	0.10	0.07	
F1	F2	F1	F2	Factor (Fertilizers)				NS	0.23	0.16	
S1	3.54	2.22	3.05	2.74	Interaction (Irrigation X Fertilizer)				NS	0.32	0.23
S2	2.16	2.92	2.53	2.94	Factor (Seed size)				NS	0.16	0.11
				Interaction (Irrigation X Seed size)				NS	0.23	0.16	
				Interaction (Fertilizer X Seed size)				0.52	0.23	0.16	
				Interaction (Irrigation X Fertilizer X Seed size)				NS	0.32	0.23	
Yield of baby tubers 25-50g (t/ha)											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	3.06	3.30	3.18	I1	3.09	3.26	3.18	F1	2.57	3.44	3.01
I2	2.96	3.17	3.06	I2	3.14	2.98	3.06	F2	3.66	2.81	3.23
Mean F	3.01	3.23		Mean S	3.12	3.12		Mean S	3.12	3.12	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
I1		I2		Factor (Irrigation)				NS	0.11	0.07	
F1	F2	F1	F2	Factor (Fertilizers)				NS	0.13	0.09	

S1	2.85	3.33	2.29	3.98	Interaction (Irrigation X Fertilizer)			NS	0.18	0.13	
S2	3.26	3.26	3.62	2.35	Factor (Seed size)			NS	0.16	0.11	
					Interaction (Irrigation X Seed size)			NS	0.22	0.16	
					Interaction (Fertilizer X Seed size)			0.51	0.22	0.16	
					Interaction (Irrigation X Fertilizer X Seed size)			0.72	0.31	0.22	
<b>Yield of baby tubers &gt;50g (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	6.91	5.87	6.39	I1	6.63	6.15	6.39	F1	6.30	5.70	6.00
I2	5.09	4.31	4.70	I2	4.75	4.65	4.70	F2	5.08	5.10	5.09
Mean F	6.00	5.09		Mean S	5.69	5.40		Mean S	5.69	5.40	
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm	
		I1		I2		Factor (Irrigation)			NS	0.39	0.28
		F1	F2	F1	F2	Factor (Fertilizers)			0.28	0.10	0.07
S1	6.73	6.53	5.87	3.63	Interaction (Irrigation X Fertilizer)			NS	0.14	0.10	
S2	7.09	5.21	4.31	4.98	Factor (Seed size)			NS	0.16	0.11	
					Interaction (Irrigation X Seed size)			NS	0.23	0.16	
					Interaction (Fertilizer X Seed size)			NS	0.23	0.16	
					Interaction (Irrigation X Fertilizer X Seed size)			0.73	0.32	0.23	
<b>Total yield (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	13.16	12.10	12.63	I1	12.93	12.33	12.63	F1	12.59	11.82	12.20
I2	11.25	10.87	11.06	I2	11.37	10.75	11.06	F2	11.71	11.26	11.49
Mean F	12.20	11.49		Mean S	12.15	11.54		Mean S	12.15	11.54	
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm	
		I1		I2		Factor (Irrigation)			NS	0.39	0.27
		F1	F2	F1	F2	Factor (Fertilizers)			NS	0.41	0.29
S1	13.51	12.36	11.68	11.06	Interaction (Irrigation X Fertilizer)			NS	0.58	0.41	
S2	12.81	11.84	10.82	10.68	Factor (Seed size)			0.59	0.26	0.18	
					Interaction (Irrigation X Seed size)			0.84	0.36	0.26	
					Interaction (Fertilizer X Seed size)			NS	0.36	0.26	
					Interaction (Irrigation X Fertilizer X Seed size)			NS	0.51	0.36	
<b>Weight of rotten tubers (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	0.35	0.36	0.36	I1	0.33	0.38	0.36	F1	0.42	0.34	0.38
I2	0.41	0.56	0.48	I2	0.58	0.39	0.48	F2	0.49	0.43	0.46
Mean F	0.38	0.46		Mean S	0.46	0.38		Mean S	0.46	0.38	
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm	
		I1		I2		Factor (Irrigation)			NS	0.03	0.02
		F1	F2	F1	F2	Factor (Fertilizers)			NS	0.05	0.04
S1	0.38	0.28	0.46	0.70	Interaction (Irrigation X Fertilizer)			NS	0.08	0.05	
S2	0.31	0.45	0.36	0.41	Factor (Seed size)			NS	0.03	0.02	
					Interaction (Irrigation X Seed size)			0.11	0.05	0.03	
					Interaction (Fertilizer X Seed size)			NS	0.05	0.03	
					Interaction (Irrigation X Fertilizer X Seed size)			0.16	0.07	0.05	
<b>% Tuber dry matter</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	19.28	19.09	19.18	I1	19.24	19.13	19.18	F1	19.10	18.93	19.02
I2	18.75	18.28	18.52	I2	18.65	18.38	18.52	F2	18.78	18.59	18.68
Mean F	19.02	18.68		Mean S	18.94	18.76		Mean S	18.94	18.76	
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm	
		I1		I2		Factor (Irrigation)			0.08	0.02	0.01
		F1	F2	F1	F2	Factor (Fertilizers)			0.07	0.02	0.02
S1	19.35	19.12	18.86	18.44	Interaction (Irrigation X Fertilizer)			0.09	0.03	0.02	
S2	19.22	19.05	18.64	18.12	Factor (Seed size)			0.07	0.03	0.02	
					Interaction (Irrigation X Seed size)			0.09	0.04	0.03	
					Interaction (Fertilizer X Seed size)			NS	0.04	0.03	
					Interaction (Irrigation X Fertilizer X Seed size)			NS	0.06	0.04	
<b>75 days crop</b>											
<b>% Baby tuber 10-25g</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			

	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	23.61	24.81	24.21	I1	24.60	23.82	24.21	F1	17.93	23.97	20.95
I2	18.29	20.83	19.56	I2	12.56	26.56	19.56	F2	19.23	26.41	22.82
Mean F	20.95	22.82		Mean S	18.58	25.19		Mean S	18.58	25.19	
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm
	I1		I2		Factor (Irrigation)				1.52	0.35	0.25
	F1	F2	F1	F2	Factor (Fertilizers)				1.52	0.35	0.25
S1	22.53	26.67	13.33	11.79	Interaction (Irrigation X Fertilizer)				NS	0.53	0.37
S2	24.69	22.95	23.24	29.88	Factor (Seed size)				1.29	0.56	0.40
					Interaction (Irrigation X Seed size)				1.82	0.79	0.56
					Interaction (Fertilizer X Seed size)				NS	0.79	0.56
					Interaction (Irrigation X Fertilizer X Seed size)				2.58	1.12	0.79
<b>% Baby tuber 25-50g</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	25.78	24.10	24.94	I1	24.32	25.56	24.94	F1	26.77	24.43	25.60
I2	25.42	23.60	24.51	I2	27.98	21.04	24.51	F2	25.53	22.18	23.85
Mean F	25.60	23.85		Mean S	26.15	23.30		Mean S	26.15	23.30	
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm
	I1		I2		Factor (Irrigation)				NS	0.46	0.33
	F1	F2	F1	F2	Factor (Fertilizers)				NS	0.67	0.48
S1	24.49	24.15	29.05	26.90	Interaction (Irrigation X Fertilizer)				NS	0.95	0.67
S2	27.07	24.06	21.78	20.30	Factor (Seed size)				1.37	0.60	0.42
					Interaction (Irrigation X Seed size)				1.94	0.84	0.60
					Interaction (Fertilizer X Seed size)				NS	0.84	0.60
					Interaction (Irrigation X Fertilizer X Seed size)				NS	1.19	0.84
<b>% Baby tuber &gt;50g</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	48.86	47.52	48.19	I1	48.92	47.45	48.19	F1	52.04	49.70	50.87
I2	52.89	47.78	50.33	I2	51.69	48.98	50.33	F2	48.57	46.73	47.65
Mean F	50.87	47.65		Mean S	50.31	48.22		Mean S	50.31	48.22	
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm
	I1		I2		Factor (Irrigation)				NS	1.03	0.73
	F1	F2	F1	F2	Factor (Fertilizers)				1.66	0.60	0.43
S1	51.64	46.20	52.44	50.94	Interaction (Irrigation X Fertilizer)				2.35	0.85	0.60
S2	46.07	48.84	53.33	44.63	Factor (Seed size)				1.26	0.55	0.39
					Interaction (Irrigation X Seed size)				NS	0.77	0.55
					Interaction (Fertilizer X Seed size)				NS	0.77	0.55
					Interaction (Irrigation X Fertilizer X Seed size)				2.52	1.10	0.77
<b>Yield of baby tubers 10-25g (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	4.33	4.42	4.37	I1	4.60	4.15	4.37	F1	3.29	4.09	3.69
I2	3.05	3.39	3.22	I2	2.12	4.32	3.22	F2	3.42	4.38	3.90
Mean F	3.69	3.90		Mean S	3.36	4.24		Mean S	3.36	4.24	
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm
	I1		I2		Factor (Irrigation)				0.32	0.07	0.05
	F1	F2	F1	F2	Factor (Fertilizers)				NS	0.08	0.06
S1	4.33	4.86	2.25	1.98	Interaction (Irrigation X Fertilizer)				NS	0.11	0.08
S2	4.33	3.97	3.84	4.80	Factor (Seed size)				0.20	0.09	0.06
					Interaction (Irrigation X Seed size)				0.28	0.12	0.09
					Interaction (Fertilizer X Seed size)				NS	0.12	0.09
					Interaction (Irrigation X Fertilizer X Seed size)				0.40	0.17	0.12
<b>Yield of baby tubers 25-50g (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	4.73	4.29	4.51	I1	4.56	4.46	4.51	F1	4.80	4.18	4.49
I2	4.25	3.88	4.07	I2	4.70	3.43	4.07	F2	4.46	3.72	4.09
Mean F	4.49	4.09		Mean S	4.63	3.95		Mean S	4.63	3.95	
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm
	I1		I2		Factor (Irrigation)				0.42	0.10	0.07
	F1	F2	F1	F2	Factor (Fertilizers)				NS	0.17	0.12
S1	4.70	4.41	4.90	4.50	Interaction (Irrigation X Fertilizer)				NS	0.24	0.17



S2	4.75	4.17	3.60	3.26	Factor (Seed size)	0.29	0.13	0.09				
					Interaction (Irrigation X Seed size)	0.42	0.18	0.13				
					Interaction (Fertilizer X Seed size)	NS	0.18	0.13				
					Interaction (Irrigation X Fertilizer X Seed size)	NS	0.26	0.18				
<b>Yield of baby tubers &gt;50g (t/ha)</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	9.00	8.43	8.72	I1	9.16	8.28	8.72	F1	9.38	8.44	8.91	
I2	8.82	7.85	8.34	I2	8.68	7.99	8.34	F2	8.46	7.83	8.14	
Mean F	8.91	8.14		Mean S	8.92	8.13		Mean S	8.92	8.13		
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm		
			I1	I2	Factor (Irrigation)			NS	0.14	0.10		
			F1	F2	Factor (Fertilizers)			0.31	0.11	0.08		
S1	9.92	8.39	8.84	8.52	Interaction (Irrigation X Fertilizer)			NS	0.16	0.11		
S2	8.08	8.47	8.80	7.18	Factor (Seed size)			0.27	0.12	0.08		
					Interaction (Irrigation X Seed size)			NS	0.16	0.12		
					Interaction (Fertilizer X Seed size)			NS	0.16	0.12		
					Interaction (Irrigation X Fertilizer X Seed size)			0.53	0.23	0.16		
<b>Total yield (t/ha)</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	18.38	17.78	18.08	I1	18.71	17.44	18.08	F1	18.03	17.04	17.54	
I2	16.70	16.40	16.55	I2	16.80	16.30	16.55	F2	17.48	16.70	17.09	
Mean F	17.54	17.09		Mean S	17.75	16.87		Mean S	17.75	16.87		
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm		
			I1	I2	Factor (Irrigation)			NS	0.46	0.32		
			F1	F2	Factor (Fertilizers)			NS	0.30	0.21		
S1	19.20	18.22	16.86	16.73	Interaction (Irrigation X Fertilizer)			NS	0.42	0.30		
S2	17.55	17.33	16.53	16.07	Factor (Seed size)			0.36	0.16	0.11		
					Interaction (Irrigation X Seed size)			0.51	0.22	0.16		
					Interaction (Fertilizer X Seed size)			NS	0.22	0.16		
					Interaction (Irrigation X Fertilizer X Seed size)			NS	0.31	0.22		
<b>Weight of rotten tubers (t/ha)</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	0.32	0.64	0.48	I1	0.41	0.56	0.48	F1	0.56	0.33	0.45	
I2	0.57	1.29	0.93	I2	1.30	0.56	0.93	F2	1.15	0.78	0.96	
Mean F	0.45	0.96		Mean S	0.85	0.56		Mean S	0.85	0.56		
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm		
			I1	I2	Factor (Irrigation)			NS	0.27	0.19		
			F1	F2	Factor (Fertilizers)			0.25	0.09	0.06		
S1	0.26	0.55	0.86	1.74	Interaction (Irrigation X Fertilizer)			NS	0.13	0.09		
S2	0.38	0.73	0.28	0.83	Factor (Seed size)			0.12	0.05	0.04		
					Interaction (Irrigation X Seed size)			0.16	0.07	0.05		
					Interaction (Fertilizer X Seed size)			NS	0.07	0.05		
					Interaction (Irrigation X Fertilizer X Seed size)			NS	0.10	0.07		
<b>Tuber dry matter (%)</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	20.06	19.85	19.96	I1	20.03	19.88	19.96	F1	19.69	19.57	19.63	
I2	19.19	19.10	19.14	I2	19.19	19.10	19.14	F2	19.53	19.42	19.47	
Mean F	19.63	19.47		Mean S	19.61	19.49		Mean S	19.61	19.49		
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm		
			I1	I2	Factor (Irrigation)			0.42	0.10	0.07		
			F1	F2	Factor (Fertilizers)			0.15	0.06	0.04		
S1	20.12	19.95	19.26	19.11	Interaction (Irrigation X Fertilizer)			NS	0.08	0.06		
S2	20.01	19.75	19.12	19.08	Factor (Seed size)			0.12	0.05	0.04		
					Interaction (Irrigation X Seed size)			NS	0.07	0.05		
					Interaction (Fertilizer X Seed size)			NS	0.07	0.05		
					Interaction (Irrigation X Fertilizer X Seed size)			NS	0.10	0.07		
<b>90 days crop</b>												
<b>% Baby tuber 10-25g</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	

I1	14.77	15.37	15.07	I1	15.21	14.92	15.07	F1	14.20	14.75	14.48	
I2	14.19	13.91	14.05	I2	10.32	17.78	14.05	F2	11.33	17.95	14.64	
Mean F	14.48	14.64		Mean S	12.77	16.35		Mean S	12.77	16.35		
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm	
					I1				I2			
					F1				F2			
					Factor (Irrigation)				NS			
					Factor (Fertilizers)				NS			
					Interaction (Irrigation X Fertilizer)				NS			
S1	16.63	13.79	11.77	8.87	Factor (Seed size)				1.58	0.69	0.49	
S2	12.90	16.95	16.60	18.95	Interaction (Irrigation X Seed size)				2.23	0.97	0.69	
					Interaction (Fertilizer X Seed size)				2.23	0.97	0.69	
					Interaction (Irrigation X Fertilizer X Seed size)				NS	1.37	0.97	
<b>% Baby tuber 25-50g</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	12.05	14.56	13.30	I1	12.91	13.69	13.30	F1	14.00	11.56	12.78	
I2	13.51	13.73	13.62	I2	16.31	10.93	13.62	F2	15.23	13.06	14.15	
Mean F	12.78	14.15		Mean S	14.61	12.31		Mean S	14.61	12.31		
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm	
					I1				I2			
					F1				F2			
					Factor (Irrigation)				NS			
					Factor (Fertilizers)				NS			
					Interaction (Irrigation X Fertilizer)				NS			
S1	11.64	14.18	16.36	16.27	Factor (Seed size)				0.68	0.30	0.21	
S2	12.46	14.93	10.65	11.20	Interaction (Irrigation X Seed size)				0.96	0.42	0.30	
					Interaction (Fertilizer X Seed size)				NS	0.42	0.30	
					Interaction (Irrigation X Fertilizer X Seed size)				NS	0.59	0.42	
<b>% Baby tuber &gt;50g</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	68.90	64.71	66.81	I1	66.55	67.06	66.81	F1	65.22	69.53	67.37	
I2	65.85	66.75	66.30	I2	64.60	67.99	66.30	F2	65.94	65.52	65.73	
Mean F	67.37	65.73		Mean S	65.58	67.52		Mean S	65.58	67.52		
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm	
					I1				I2			
					F1				F2			
					Factor (Irrigation)				NS			
					Factor (Fertilizers)				NS			
					Interaction (Irrigation X Fertilizer)				NS			
S1	67.61	65.50	62.83	66.38	Factor (Seed size)				NS	1.37	0.97	
S2	70.19	63.93	68.87	67.11	Interaction (Irrigation X Seed size)				NS	1.35	0.95	
					Interaction (Fertilizer X Seed size)				3.10	1.35	0.95	
					Interaction (Irrigation X Fertilizer X Seed size)				NS	1.90	1.35	
<b>Yield of baby tubers 10-25g (t/ha)</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	3.31	2.91	3.11	I1	3.35	2.86	3.11	F1	3.05	2.81	2.93	
I2	2.55	2.33	2.44	I2	1.86	3.02	2.44	F2	2.16	3.07	2.62	
Mean F	2.93	2.62		Mean S	2.61	2.94		Mean S	2.61	2.94		
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm	
					I1				I2			
					F1				F2			
					Factor (Irrigation)				0.47			
					Factor (Fertilizers)				NS			
					Interaction (Irrigation X Fertilizer)				NS			
S1	3.91	2.79	2.19	1.53	Factor (Seed size)				0.28	0.12	0.09	
S2	2.70	3.02	2.92	3.12	Interaction (Irrigation X Seed size)				0.39	0.17	0.12	
					Interaction (Fertilizer X Seed size)				0.39	0.17	0.12	
					Interaction (Irrigation X Fertilizer X Seed size)				NS	0.24	0.17	
<b>Yield of baby tubers 25-50g (t/ha)</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	2.68	2.77	2.72	I1	2.80	2.64	2.72	F1	2.89	2.25	2.57	
I2	2.46	2.32	2.39	I2	2.92	1.86	2.39	F2	2.83	2.25	2.54	
Mean F	2.57	2.54		Mean S	2.86	2.25		Mean S	2.86	2.25		
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm	
					I1				I2			
					F1				F2			
					Factor (Irrigation)				NS			
					Factor (Fertilizers)				NS			
					Interaction (Irrigation X Fertilizer)				NS			
S1	2.73	2.87	3.05	2.79	Factor (Seed size)				0.18	0.08	0.05	
S2	2.62	2.66	1.87	1.84	Interaction (Irrigation X Seed size)				0.18	0.08	0.05	
					Interaction (Fertilizer X Seed size)				0.18	0.08	0.05	
					Interaction (Irrigation X Fertilizer X Seed size)				0.18	0.08	0.05	

				Interaction (Irrigation X Seed size)				0.25	0.11	0.08	
				Interaction (Fertilizer X Seed size)				NS	0.11	0.08	
				Interaction (Irrigation X Fertilizer X Seed size)				NS	0.15	0.11	
<b>Yield of baby tubers &gt;50g (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	15.32	12.32	13.82	I1	14.58	13.06	13.82	F1	13.77	13.42	13.59
I2	11.87	11.21	11.54	I2	11.52	11.56	11.54	F2	12.33	11.20	11.76
Mean F	13.59	11.76		Mean S	13.05	12.31		Mean S	13.05	12.31	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		I1		I2		Factor (Irrigation)		0.84	0.19	0.14	
		F1	F2	F1	F2	Factor (Fertilizers)		0.22	0.08	0.06	
S1	15.88	13.27	11.66	11.38	Interaction (Irrigation X Fertilizer)		0.31	0.11	0.08		
S2	14.75	11.36	12.08	11.03	Factor (Seed size)		0.34	0.15	0.10		
				Interaction (Irrigation X Seed size)				0.47	0.21	0.15	
				Interaction (Fertilizer X Seed size)				0.47	0.21	0.15	
				Interaction (Irrigation X Fertilizer X Seed size)				NS	0.29	0.21	
<b>Total yield (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	22.26	19.02	20.64	I1	21.88	19.40	20.64	F1	21.07	19.29	20.18
I2	18.10	16.81	17.45	I2	17.90	17.00	17.45	F2	18.72	17.11	17.91
Mean F	20.18	17.91		Mean S	19.89	18.20		Mean S	19.89	18.20	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		I1		I2		Factor (Irrigation)		0.95	0.22	0.15	
		F1	F2	F1	F2	Factor (Fertilizers)		0.91	0.33	0.23	
S1	23.50	20.27	18.64	17.16	Interaction (Irrigation X Fertilizer)		1.28	0.46	0.33		
S2	21.02	17.78	17.56	16.45	Factor (Seed size)		0.77	0.33	0.24		
				Interaction (Irrigation X Seed size)				1.09	0.47	0.33	
				Interaction (Fertilizer X Seed size)				NS	0.47	0.33	
				Interaction (Irrigation X Fertilizer X Seed size)				NS	0.67	0.47	
<b>Weight of rotten tubers (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	0.95	1.04	1.00	I1	1.15	0.84	1.00	F1	1.35	0.82	1.08
I2	1.22	0.96	1.09	I2	1.60	0.57	1.09	F2	1.40	0.60	1.00
Mean F	1.08	1.00		Mean S	1.38	0.71		Mean S	1.38	0.71	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		I1		I2		Factor (Irrigation)		NS	0.20	0.14	
		F1	F2	F1	F2	Factor (Fertilizers)		NS	0.15	0.11	
S1	0.97	1.33	1.73	1.46	Interaction (Irrigation X Fertilizer)		NS	0.22	0.15		
S2	0.93	0.75	0.70	0.45	Factor (Seed size)		0.57	0.25	0.18		
				Interaction (Irrigation X Seed size)				NS	0.35	0.25	
				Interaction (Fertilizer X Seed size)				NS	0.35	0.25	
				Interaction (Irrigation X Fertilizer X Seed size)				NS	0.50	0.35	
<b>Tuber dry matter (%)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	20.74	20.06	20.40	I1	20.50	20.31	20.40	F1	20.50	20.31	20.40
I2	20.06	19.82	19.94	I2	20.00	19.88	19.94	F2	20.00	19.88	19.94
Mean F	20.40	19.94		Mean S	20.25	20.09		Mean S	20.25	20.09	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		I1		I2		Factor (Irrigation)		0.34	0.08	0.05	
		F1	F2	F1	F2	Factor (Fertilizers)		0.22	0.08	0.06	
S1	20.87	20.12	20.12	19.88	Interaction (Irrigation X Fertilizer)		0.30	0.11	0.08		
S2	20.62	20.00	20.00	19.75	Factor (Seed size)		0.14	0.06	0.04		
				Interaction (Irrigation X Seed size)				NS	0.08	0.06	
				Interaction (Fertilizer X Seed size)				NS	0.08	0.06	
				Interaction (Irrigation X Fertilizer X Seed size)				NS	0.12	0.08	

**Table 437:** Plant emergence (%), grade-wise baby tuber (%), grade-wise baby tuber yield & total tuber yield (t/ha) weight (t/ha) of rotten tubers and tuber dry matter (%) in 60, 75 & 90 days crop of cultivar **K Pukhraj**.

60 days crop												
Seed wt (t/ha)												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	5.34	4.88	5.11	I1	5.03	5.20	5.11	F1	5.25	5.11	5.18	
I2	5.02	4.97	4.99	I2	5.06	4.93	4.99	F2	4.83	5.02	4.93	
Mean F	5.18	4.93		Mean S	5.04	5.07		Mean S	5.04	5.07		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
	I1		I2		Factor (Irrigation)				NS	0.06	0.04	
	F1	F2	F1	F2	Factor (Fertilizers)				NS	0.14	0.10	
S1	5.32	4.73	5.18	4.93	Interaction (Irrigation X Fertilizer)				NS	0.20	0.14	
S2	5.36	5.03	4.86	5.00	Factor (Seed size)				NS	0.09	0.06	
					Interaction (Irrigation X Seed size)				NS	0.12	0.09	
					Interaction (Fertilizer X Seed size)				NS	0.12	0.09	
					Interaction (Irrigation X Fertilizer X Seed size)				NS	0.17	0.12	
% Emergence												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	90.00	90.42	90.21	I1	89.17	91.25	90.21	F1	92.08	90.00	91.04	
I2	92.08	90.42	91.25	I2	92.92	89.58	91.25	F2	90.00	90.83	90.42	
Mean F	91.04	90.42		Mean S	91.04	90.42		Mean S	91.04	90.42		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
	I1		I2		Factor (Irrigation)				NS	0.55	0.39	
	F1	F2	F1	F2	Factor (Fertilizers)				NS	2.06	1.46	
S1	89.17	89.17	95.00	90.83	Interaction (Irrigation X Fertilizer)				NS	2.92	2.06	
S2	90.83	91.67	89.17	90.00	Factor (Seed size)				NS	1.61	1.14	
					Interaction (Irrigation X Seed size)				NS	2.28	1.61	
					Interaction (Fertilizer X Seed size)				NS	2.28	1.61	
					Interaction (Irrigation X Fertilizer X Seed size)				NS	3.23	2.28	
% Baby tuber 10-25g												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	32.42	37.53	34.97	I1	36.66	33.29	34.97	F1	28.68	30.93	29.80	
I2	27.19	32.11	29.65	I2	31.02	28.28	29.65	F2	39.00	30.64	34.82	
Mean F	29.80	34.82		Mean S	33.84	30.78		Mean S	33.84	30.78		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
	I1		I2		Factor (Irrigation)				2.43	0.56	0.39	
	F1	F2	F1	F2	Factor (Fertilizers)				2.49	0.90	0.64	
S1	32.98	40.33	24.37	37.68	Interaction (Irrigation X Fertilizer)				NS	1.28	0.90	
S2	31.85	34.73	30.01	26.55	Factor (Seed size)				1.54	0.67	0.47	
					Interaction (Irrigation X Seed size)				NS	0.94	0.67	
					Interaction (Fertilizer X Seed size)				2.18	0.94	0.67	
					Interaction (Irrigation X Fertilizer X Seed size)				3.08	1.34	0.94	
% Baby tuber 25-50g												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	24.57	26.16	25.37	I1	22.49	28.24	25.37	F1	30.87	30.16	30.52	
I2	36.46	23.77	30.12	I2	27.78	32.46	30.12	F2	19.40	30.53	24.97	
Mean F	30.52	24.97		Mean S	25.14	30.35		Mean S	25.14	30.35		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
	I1		I2		Factor (Irrigation)				4.49	1.03	0.73	
	F1	F2	F1	F2	Factor (Fertilizers)				1.34	0.48	0.34	
S1	25.78	19.21	35.97	19.59	Interaction (Irrigation X Fertilizer)				1.89	0.68	0.48	
S2	23.37	33.11	36.96	27.96	Factor (Seed size)				1.00	0.43	0.31	
					Interaction (Irrigation X Seed size)				NS	0.61	0.43	
					Interaction (Fertilizer X Seed size)				1.41	0.61	0.43	
					Interaction (Irrigation X Fertilizer X Seed size)				2.00	0.87	0.61	
% Baby tuber >50g												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	

I1	40.25	28.32	34.28	I1	33.92	34.65	34.28	F1	37.71	37.41	37.56		
I2	34.87	40.76	37.81	I2	38.57	37.05	37.81	F2	34.78	34.29	34.54		
Mean F	37.56	34.54		Mean S	36.24	35.85		Mean S	36.24	35.85			
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm			
					I1			I2					
					F1			F2					
					Factor (Irrigation)			2.53	0.58	0.41			
					Factor (Fertilizers)			2.40	0.87	0.62			
S1	37.48	30.35	37.93	39.21	Interaction (Irrigation X Fertilizer)						3.40	1.23	0.87
S2	43.02	26.28	31.80	42.30	Factor (Seed size)						NS	0.95	0.67
					Interaction (Irrigation X Seed size)			NS	1.34	0.95			
					Interaction (Fertilizer X Seed size)			NS	1.34	0.95			
					Interaction (Irrigation X Fertilizer X Seed size)			4.35	1.89	1.34			
<b>Yield of baby tubers 10-25g (t/ha)</b>													
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size					
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F		
I1	4.81	5.31	5.06	I1	5.42	4.71	5.06	F1	4.15	4.17	4.16		
I2	3.51	3.81	3.66	I2	3.95	3.37	3.66	F2	5.22	3.90	4.56		
Mean F	4.16	4.56		Mean S	4.68	4.04		Mean S	4.68	4.04			
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm			
					I1			I2					
					F1			F2					
					Factor (Irrigation)			0.17	0.04	0.03			
					Factor (Fertilizers)			0.29	0.10	0.07			
S1	5.00	5.83	3.30	4.60	Interaction (Irrigation X Fertilizer)						NS	0.15	0.10
S2	4.62	4.79	3.72	3.01	Factor (Seed size)						0.29	0.13	0.09
					Interaction (Irrigation X Seed size)			NS	0.18	0.13			
					Interaction (Fertilizer X Seed size)			0.41	0.18	0.13			
					Interaction (Irrigation X Fertilizer X Seed size)			0.58	0.25	0.18			
<b>Yield of baby tubers 25-50g (t/ha)</b>													
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size					
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F		
I1	3.65	3.68	3.66	I1	3.34	3.98	3.66	F1	4.40	3.99	4.19		
I2	4.73	2.78	3.76	I2	3.64	3.87	3.76	F2	2.59	3.87	3.23		
Mean F	4.19	3.23		Mean S	3.49	3.93		Mean S	3.49	3.93			
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm			
					I1			I2					
					F1			F2					
					Factor (Irrigation)			NS	0.16	0.11			
					Factor (Fertilizers)			0.21	0.08	0.05			
S1	3.91	2.78	4.88	2.40	Interaction (Irrigation X Fertilizer)						0.30	0.11	0.08
S2	3.39	4.57	4.58	3.17	Factor (Seed size)						0.22	0.09	0.07
					Interaction (Irrigation X Seed size)			NS	0.13	0.09			
					Interaction (Fertilizer X Seed size)			0.30	0.13	0.09			
					Interaction (Irrigation X Fertilizer X Seed size)			0.43	0.19	0.13			
<b>Yield of baby tubers &gt;50g (t/ha)</b>													
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size					
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F		
I1	5.97	4.01	4.99	I1	5.05	4.93	4.99	F1	5.42	5.09	5.26		
I2	4.54	4.80	4.67	I2	4.97	4.37	4.67	F2	4.60	4.21	4.40		
Mean F	5.26	4.40		Mean S	5.01	4.65		Mean S	5.01	4.65			
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm			
					I1			I2					
					F1			F2					
					Factor (Irrigation)			NS	0.10	0.07			
					Factor (Fertilizers)			0.55	0.20	0.14			
S1	5.71	4.39	5.13	4.80	Interaction (Irrigation X Fertilizer)						0.77	0.28	0.20
S2	6.24	3.63	3.95	4.79	Factor (Seed size)						0.29	0.13	0.09
					Interaction (Irrigation X Seed size)			NS	0.18	0.13			
					Interaction (Fertilizer X Seed size)			NS	0.18	0.13			
					Interaction (Irrigation X Fertilizer X Seed size)			0.58	0.25	0.18			
<b>Total yield (t/ha)</b>													
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size					
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F		
I1	14.85	14.13	14.49	I1	14.83	14.15	14.49	F1	14.38	13.45	13.91		
I2	12.98	11.78	12.38	I2	12.89	11.86	12.38	F2	13.34	12.56	12.95		
Mean F	13.91	12.95		Mean S	13.86	13.01		Mean S	13.86	13.01			
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm			
					I1			I2					
					F1			F2					
					Factor (Irrigation)			0.43	0.10	0.07			
					Factor (Fertilizers)			0.76	0.28	0.19			
S1	15.20	14.45	13.55	12.23	Interaction (Irrigation X Fertilizer)						NS	0.39	0.28
S2	14.50	13.80	12.40	11.32	Factor (Seed size)						0.58	0.25	0.18

				Interaction (Irrigation X Seed size)				NS	0.36	0.25		
				Interaction (Fertilizer X Seed size)				NS	0.36	0.25		
				Interaction (Irrigation X Fertilizer X Seed size)				NS	0.51	0.36		
<b>Weight of rotten tubers (t/ha)</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	0.42	1.14	0.78	I1	1.03	0.54	0.78	F1	0.41	0.21	0.31	
I2	0.20	0.39	0.29	I2	0.33	0.26	0.29	F2	0.95	0.59	0.77	
Mean F	0.31	0.77		Mean S	0.68	0.40		Mean S	0.68	0.40		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
		I1		I2		Factor (Irrigation)				0.18	0.04	0.03
		F1	F2	F1	F2	Factor (Fertilizers)				0.16	0.06	0.04
S1	0.59	1.46	0.24	0.43	Interaction (Irrigation X Fertilizer)				0.22	0.08	0.06	
S2	0.26	0.82	0.15	0.36	Factor (Seed size)				0.18	0.08	0.06	
				Interaction (Irrigation X Seed size)				0.26	0.11	0.08		
				Interaction (Fertilizer X Seed size)				NS	0.11	0.08		
				Interaction (Irrigation X Fertilizer X Seed size)				NS	0.16	0.11		
<b>Tuber dry matter (%)</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	19.06	18.67	18.86	I1	19.00	18.73	18.86	F1	18.62	18.51	18.56	
I2	18.07	17.94	18.00	I2	18.06	17.95	18.00	F2	18.44	18.17	18.30	
Mean F	18.56	18.30		Mean S	18.53	18.34		Mean S	18.53	18.34		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
		I1		I2		Factor (Irrigation)				0.05	0.01	0.01
		F1	F2	F1	F2	Factor (Fertilizers)				0.13	0.05	0.03
S1	19.12	18.87	18.12	18.00	Interaction (Irrigation X Fertilizer)				NS	0.07	0.05	
S2	19.00	18.46	18.02	17.88	Factor (Seed size)				0.09	0.04	0.03	
				Interaction (Irrigation X Seed size)				NS	0.05	0.04		
				Interaction (Fertilizer X Seed size)				NS	0.05	0.04		
				Interaction (Irrigation X Fertilizer X Seed size)				NS	0.08	0.05		
<b>75 days crop</b>												
<b>% Baby tuber 10-25g</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	20.92	20.31	20.62	I1	23.09	18.15	20.62	F1	20.34	26.10	23.22	
I2	25.51	19.29	22.40	I2	21.43	23.37	22.40	F2	24.18	15.42	19.80	
Mean F	23.22	19.80		Mean S	22.26	20.76		Mean S	22.26	20.76		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
		I1		I2		Factor (Irrigation)				NS	0.49	0.35
		F1	F2	F1	F2	Factor (Fertilizers)				2.10	0.76	0.54
S1	21.26	24.91	19.41	23.45	Interaction (Irrigation X Fertilizer)				2.97	1.08	0.76	
S2	20.58	15.72	31.61	15.12	Factor (Seed size)				NS	0.85	0.60	
				Interaction (Irrigation X Seed size)				2.78	1.21	0.85		
				Interaction (Fertilizer X Seed size)				2.78	1.21	0.85		
				Interaction (Irrigation X Fertilizer X Seed size)				3.93	1.71	1.21		
<b>% Baby tuber 25-50g</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	19.61	16.76	18.19	I1	18.29	18.09	18.19	F1	22.40	22.44	22.42	
I2	25.23	23.72	24.47	I2	27.23	21.72	24.47	F2	23.12	17.36	20.24	
Mean F	22.42	20.24		Mean S	22.76	19.90		Mean S	22.76	19.90		
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm		
		I1		I2		Factor (Irrigation)				3.87	0.89	0.63
		F1	F2	F1	F2	Factor (Fertilizers)				NS	1.11	0.79
S1	18.68	17.89	26.11	28.34	Interaction (Irrigation X Fertilizer)				NS	1.57	1.11	
S2	20.54	15.63	24.34	19.10	Factor (Seed size)				NS	1.73	1.22	
				Interaction (Irrigation X Seed size)				NS	2.44	1.73		
				Interaction (Fertilizer X Seed size)				NS	2.44	1.73		
				Interaction (Irrigation X Fertilizer X Seed size)				NS	3.46	2.44		
<b>% Baby tuber &gt;50g</b>												
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size				
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F	
I1	56.24	55.59	55.92	I1	53.51	58.33	55.92	F1	50.92	46.64	48.78	

I2	41.32	48.81	45.06	I2	43.03	47.09	45.06	F2	45.62	58.78	52.20
Mean F	48.78	52.20		Mean S	48.27	52.71		Mean S	48.27	52.71	
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm
	I1		I2		Factor (Irrigation)				4.20	0.96	0.68
	F1	F2	F1	F2	Factor (Fertilizers)				NS	1.65	1.17
S1	56.72	50.29	45.11	40.95	Interaction (Irrigation X Fertilizer)				NS	2.33	1.65
S2	55.76	60.89	37.52	56.67	Factor (Seed size)				3.29	1.43	1.01
					Interaction (Irrigation X Seed size)				NS	2.02	1.43
					Interaction (Fertilizer X Seed size)				4.65	2.02	1.43
					Interaction (Irrigation X Fertilizer X Seed size)				NS	2.86	2.02
<b>Yield of baby tubers 10-25g (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	4.37	3.64	4.00	I1	4.57	3.44	4.00	F1	4.22	5.08	4.65
I2	4.93	3.27	4.10	I2	3.91	4.29	4.10	F2	4.26	2.66	3.46
Mean F	4.65	3.46		Mean S	4.24	3.87		Mean S	4.24	3.87	
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm
	I1		I2		Factor (Irrigation)				NS	0.16	0.12
	F1	F2	F1	F2	Factor (Fertilizers)				0.42	0.15	0.11
S1	4.62	4.51	3.81	4.01	Interaction (Irrigation X Fertilizer)				0.59	0.21	0.15
S2	4.11	2.78	6.05	2.54	Factor (Seed size)				0.18	0.08	0.06
					Interaction (Irrigation X Seed size)				0.26	0.11	0.08
					Interaction (Fertilizer X Seed size)				0.26	0.11	0.08
					Interaction (Irrigation X Fertilizer X Seed size)				0.36	0.16	0.11
<b>Yield of baby tubers 25-50g (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	4.08	3.09	3.59	I1	3.75	3.42	3.59	F1	4.59	4.38	4.49
I2	4.89	4.02	4.46	I2	4.98	3.93	4.46	F2	4.14	2.97	3.56
Mean F	4.49	3.56		Mean S	4.37	3.68		Mean S	4.37	3.68	
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm
	I1		I2		Factor (Irrigation)				NS	0.25	0.18
	F1	F2	F1	F2	Factor (Fertilizers)				0.83	0.30	0.21
S1	4.07	3.44	5.12	4.85	Interaction (Irrigation X Fertilizer)				NS	0.42	0.30
S2	4.10	2.74	4.66	3.20	Factor (Seed size)				NS	0.40	0.28
					Interaction (Irrigation X Seed size)				NS	0.56	0.40
					Interaction (Fertilizer X Seed size)				NS	0.56	0.40
					Interaction (Irrigation X Fertilizer X Seed size)				NS	0.79	0.56
<b>Yield of baby tubers &gt;50g (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	11.74	9.88	10.81	I1	10.73	10.90	10.81	F1	10.60	9.15	9.88
I2	8.01	8.24	8.13	I2	7.92	8.33	8.13	F2	8.04	10.08	9.06
Mean F	9.88	9.06		Mean S	9.32	9.61		Mean S	9.32	9.61	
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm
	I1		I2		Factor (Irrigation)				0.47	0.11	0.08
	F1	F2	F1	F2	Factor (Fertilizers)				0.51	0.19	0.13
S1	12.37	9.09	8.84	7.00	Interaction (Irrigation X Fertilizer)				0.73	0.26	0.19
S2	11.12	10.67	7.18	9.49	Factor (Seed size)				NS	0.20	0.14
					Interaction (Irrigation X Seed size)				NS	0.28	0.20
					Interaction (Fertilizer X Seed size)				0.64	0.28	0.20
					Interaction (Irrigation X Fertilizer X Seed size)				NS	0.39	0.28
<b>Total yield (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	20.87	17.94	19.40	I1	20.05	18.76	19.40	F1	20.70	19.54	20.12
I2	19.37	16.92	18.15	I2	18.35	17.94	18.15	F2	17.70	17.16	17.43
Mean F	20.12	17.43		Mean S	19.20	18.35		Mean S	19.20	18.35	
Seed size X Fertilizers X Irrigation					Factors				CD (0.05)	SEd	SEm
	I1		I2		Factor (Irrigation)				NS	0.48	0.34
	F1	F2	F1	F2	Factor (Fertilizers)				1.26	0.46	0.32
S1	21.79	18.31	19.61	17.10	Interaction (Irrigation X Fertilizer)				NS	0.64	0.46
S2	19.94	17.58	19.14	16.74	Factor (Seed size)				NS	0.47	0.33
					Interaction (Irrigation X Seed size)				NS	0.67	0.47

				Interaction (Fertilizer X Seed size)				NS	0.67	0.47	
				Interaction (Irrigation X Fertilizer X Seed size)				NS	0.94	0.67	
<b>Weight of rotten tubers (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	0.68	1.34	1.01	I1	1.00	1.01	1.01	F1	1.29	0.94	1.11
I2	1.55	1.39	1.47	I2	1.55	1.39	1.47	F2	1.26	1.46	1.36
Mean F	1.11	1.36		Mean S	1.27	1.20		Mean S	1.27	1.20	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		I1		I2		Factor (Irrigation)		0.20	0.05	0.03	
		F1	F2	F1	F2	Factor (Fertilizers)		NS	0.17	0.12	
S1	0.73	1.28	1.84	1.25	Interaction (Irrigation X Fertilizer)		NS	0.25	0.17		
S2	0.63	1.39	1.25	1.53	Factor (Seed size)		NS	0.13	0.09		
				Interaction (Irrigation X Seed size)				NS	0.18	0.13	
				Interaction (Fertilizer X Seed size)				NS	0.18	0.13	
				Interaction (Irrigation X Fertilizer X Seed size)				NS	0.26	0.18	
<b>Tuber dry matter (%)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	19.72	19.22	19.47	I1	19.61	19.34	19.47	F1	19.45	19.20	19.32
I2	18.92	18.50	18.71	I2	18.88	18.55	18.71	F2	19.04	18.69	18.86
Mean F	19.32	18.86		Mean S	19.24	18.94		Mean S	19.24	18.94	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		I1		I2		Factor (Irrigation)		0.21	0.05	0.03	
		F1	F2	F1	F2	Factor (Fertilizers)		0.12	0.04	0.03	
S1	19.89	19.32	19.00	18.75	Interaction (Irrigation X Fertilizer)		NS	0.06	0.04		
S2	19.55	19.12	18.85	18.25	Factor (Seed size)		0.08	0.03	0.02		
				Interaction (Irrigation X Seed size)				NS	0.05	0.03	
				Interaction (Fertilizer X Seed size)				NS	0.05	0.03	
				Interaction (Irrigation X Fertilizer X Seed size)				0.15	0.07	0.05	
<b>90 days crop</b>											
<b>% Baby tuber 10-25g</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	13.53	13.11	13.32	I1	13.03	13.62	13.32	F1	13.14	15.29	14.21
I2	14.90	7.93	11.41	I2	9.47	13.35	11.41	F2	9.36	11.68	10.52
Mean F	14.21	10.52		Mean S	11.25	13.49		Mean S	11.25	13.49	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		I1		I2		Factor (Irrigation)		NS	0.93	0.66	
		F1	F2	F1	F2	Factor (Fertilizers)		NS	1.57	1.11	
S1	13.21	12.84	13.07	5.88	Interaction (Irrigation X Fertilizer)		NS	2.21	1.57		
S2	13.85	13.39	16.73	9.98	Factor (Seed size)		NS	1.28	0.91		
				Interaction (Irrigation X Seed size)				NS	1.81	1.28	
				Interaction (Fertilizer X Seed size)				NS	1.81	1.28	
				Interaction (Irrigation X Fertilizer X Seed size)				NS	2.57	1.81	
<b>% Baby tuber 25-50g</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	11.37	14.50	12.93	I1	12.13	13.74	12.93	F1	13.89	18.08	15.98
I2	20.59	21.71	21.15	I2	20.68	21.62	21.15	F2	18.92	17.28	18.10
Mean F	15.98	18.10		Mean S	16.40	17.68		Mean S	16.40	17.68	
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)	SEd	SEm	
		I1		I2		Factor (Irrigation)		3.20	0.73	0.52	
		F1	F2	F1	F2	Factor (Fertilizers)		NS	0.80	0.57	
S1	9.88	14.38	17.89	23.47	Interaction (Irrigation X Fertilizer)		NS	1.13	0.80		
S2	12.86	14.61	23.29	19.95	Factor (Seed size)		NS	0.62	0.44		
				Interaction (Irrigation X Seed size)				NS	0.87	0.62	
				Interaction (Fertilizer X Seed size)				2.00	0.87	0.62	
				Interaction (Irrigation X Fertilizer X Seed size)				2.83	1.23	0.87	
<b>% Baby tuber &gt;50g</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	72.67	67.03	69.85	I1	71.84	67.86	69.85	F1	69.74	64.14	66.94
I2	61.21	64.70	62.96	I2	65.40	60.52	62.96	F2	67.50	64.23	65.87



Mean F	66.94	65.87		Mean S	68.62	64.19		Mean S	68.62	64.19	
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm	
	I1		I2		Factor (Irrigation)			5.08	1.16	0.82	
	F1	F2	F1	F2	Factor (Fertilizers)			NS	0.90	0.64	
S1	74.16	69.53	65.32	65.48	Interaction (Irrigation X Fertilizer)			3.51	1.27	0.90	
S2	71.18	64.53	57.11	63.93	Factor (Seed size)			1.86	0.81	0.57	
					Interaction (Irrigation X Seed size)			NS	1.14	0.81	
					Interaction (Fertilizer X Seed size)			NS	1.14	0.81	
					Interaction (Irrigation X Fertilizer X Seed size)			3.72	1.61	1.14	
<b>Yield of baby tubers 10-25g (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	3.46	3.15	3.30	I1	3.28	3.32	3.30	F1	3.32	3.72	3.52
I2	3.58	1.80	2.69	I2	2.24	3.14	2.69	F2	2.20	2.74	2.47
Mean F	3.52	2.47		Mean S	2.76	3.23		Mean S	2.76	3.23	
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm	
	I1		I2		Factor (Irrigation)			NS	0.23	0.17	
	F1	F2	F1	F2	Factor (Fertilizers)			1.00	0.36	0.26	
S1	3.46	3.10	3.17	1.30	Interaction (Irrigation X Fertilizer)			NS	0.51	0.36	
S2	3.45	3.19	3.99	2.29	Factor (Seed size)			NS	0.31	0.22	
					Interaction (Irrigation X Seed size)			NS	0.44	0.31	
					Interaction (Fertilizer X Seed size)			NS	0.44	0.31	
					Interaction (Irrigation X Fertilizer X Seed size)			NS	0.62	0.44	
<b>Yield of baby tubers 25-50g (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	2.91	3.48	3.20	I1	3.05	3.34	3.20	F1	3.50	4.38	3.94
I2	4.97	4.75	4.86	I2	4.79	4.93	4.86	F2	4.33	3.90	4.11
Mean F	3.94	4.11		Mean S	3.92	4.14		Mean S	3.92	4.14	
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm	
	I1		I2		Factor (Irrigation)			1.45	0.33	0.24	
	F1	F2	F1	F2	Factor (Fertilizers)			NS	0.20	0.14	
S1	2.62	3.48	4.39	5.19	Interaction (Irrigation X Fertilizer)			NS	0.28	0.20	
S2	3.20	3.48	5.56	4.31	Factor (Seed size)			NS	0.18	0.13	
					Interaction (Irrigation X Seed size)			NS	0.26	0.18	
					Interaction (Fertilizer X Seed size)			0.59	0.26	0.18	
					Interaction (Irrigation X Fertilizer X Seed size)			NS	0.36	0.26	
<b>Yield of baby tubers &gt;50g (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	18.57	16.09	17.33	I1	18.13	16.53	17.33	F1	17.68	15.66	16.67
I2	14.77	14.14	14.46	I2	15.20	13.71	14.46	F2	15.65	14.58	15.12
Mean F	16.67	15.12		Mean S	16.67	15.12		Mean S	16.67	15.12	
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm	
	I1		I2		Factor (Irrigation)			0.95	0.22	0.15	
	F1	F2	F1	F2	Factor (Fertilizers)			0.28	0.10	0.07	
S1	19.44	16.82	15.93	14.47	Interaction (Irrigation X Fertilizer)			0.39	0.14	0.10	
S2	17.71	15.36	13.61	13.81	Factor (Seed size)			0.36	0.16	0.11	
					Interaction (Irrigation X Seed size)			NS	0.22	0.16	
					Interaction (Fertilizer X Seed size)			0.51	0.22	0.16	
					Interaction (Irrigation X Fertilizer X Seed size)			NS	0.32	0.22	
<b>Total yield (t/ha)</b>											
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size			
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F
I1	25.56	24.00	24.78	I1	25.22	24.34	24.78	F1	25.34	24.36	24.85
I2	24.14	21.90	23.02	I2	23.27	22.77	23.02	F2	23.15	22.75	22.95
Mean F	24.85	22.95		Mean S	24.24	23.56		Mean S	24.24	23.56	
Seed size X Fertilizers X Irrigation					Factors			CD (0.05)	SEd	SEm	
	I1		I2		Factor (Irrigation)			NS	0.76	0.54	
	F1	F2	F1	F2	Factor (Fertilizers)			0.88	0.32	0.23	
S1	26.24	24.20	24.43	22.10	Interaction (Irrigation X Fertilizer)			NS	0.45	0.32	
S2	24.88	23.80	23.84	21.70	Factor (Seed size)			NS	0.43	0.31	
					Interaction (Irrigation X Seed size)			NS	0.61	0.43	
					Interaction (Fertilizer X Seed size)			NS	0.61	0.43	

				Interaction (Irrigation X Fertilizer X Seed size)				NS		0.87		0.61		
<b>Weight of rotten tubers (t/ha)</b>														
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size						
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F			
I1	0.62	1.28	0.95	I1	0.75	1.15	0.95	F1	0.83	0.61	0.72			
I2	0.81	1.22	1.02	I2	1.05	0.99	1.02	F2	0.97	1.54	1.25			
Mean F	0.72	1.25		Mean S	0.90	1.07		Mean S	0.90	1.07				
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)		SEd		SEm		
	I1		I2		Factor (Irrigation)				NS		0.16		0.11	
	F1	F2	F1	F2	Factor (Fertilizers)				0.32		0.12		0.08	
S1	0.72	0.79	0.94	1.15	Interaction (Irrigation X Fertilizer)				NS		0.17		0.12	
S2	0.53	1.78	0.68	1.30	Factor (Seed size)				NS		0.11		0.08	
				Interaction (Irrigation X Seed size)				NS		0.16		0.11		
				Interaction (Fertilizer X Seed size)				0.36		0.16		0.11		
				Interaction (Irrigation X Fertilizer X Seed size)				NS		0.22		0.16		
<b>Tuber dry matter (%)</b>														
Irrigation X Fertilizers				Irrigation X Seed size				Fertilizers X Seed size						
	F1	F2	Mean I		S1	S2	Mean I		S1	S2	Mean F			
I1	19.99	19.31	19.65	I1	19.72	19.58	19.65	F1	19.62	19.47	19.55			
I2	19.10	19.00	19.05	I2	19.06	19.04	19.05	F2	19.16	19.15	19.16			
Mean F	19.55	19.16		Mean S	19.39	19.31		Mean S	19.39	19.31				
Seed size X Fertilizers X Irrigation				Factors				CD (0.05)		SEd		SEm		
	I1		I2		Factor (Irrigation)				0.16		0.04		0.03	
	F1	F2	F1	F2	Factor (Fertilizers)				0.20		0.07		0.05	
S1	20.12	19.32	19.12	19.00	Interaction (Irrigation X Fertilizer)				0.29		0.10		0.07	
S2	19.86	19.30	19.08	19.00	Factor (Seed size)				NS		0.07		0.05	
				Interaction (Irrigation X Seed size)				NS		0.09		0.07		
				Interaction (Fertilizer X Seed size)				NS		0.09		0.07		
				Interaction (Irrigation X Fertilizer X Seed size)				NS		0.13		0.09		

**Table 438:** Disease reaction

Hybrids	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
S1F111	Did not appear	Did not appear	Did not appear	Did not appear	10.0	22.5	Did not appear	22.5	21.7
S1F112					12.5	27.5		25.0	23.3
S1F211					12.5	22.5		27.5	20.0
S1F212					10.0	17.5		22.5	23.3
S2F111					10.0	20.0		20.0	18.3
S2F112					12.5	20.0		20.0	23.3
S2F211					15.0	22.5		30.0	25.0
S2F212					7.5	17.5		25.0	20.0
S1F111					10.0	22.5		12.5	15.0
S1F112					15.0	25.0		22.5	25.0
S1F211					15.0	27.5		30.0	26.7
S1F212					12.5	22.5		27.5	23.3
S2F111					10.0	22.5		25.0	25.0
S2F112					15.0	22.5		22.5	20.0
S2F211					10.0	20.0		32.5	26.7
S2F212					10.0	20.0		22.5	23.3

**Table 439:** Total weight loss after 75 days storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt. Loss due to sprouting (At the end of storage of 75 days)	% Loss due to rottag		Total wt. Losses (%)
		At 6 weeks	End of storage ( 75 days)		Number basis	Weight basis	
S1F111	>6 weeks	Nil	Nil	0	30	30.56	32.38
S1F112	>6 weeks	Nil	Nil	0	30	24.33	26.53
S1F211	>6 weeks	Nil	Nil	0	20	19.29	21.29
S1F212	>6 weeks	Nil	Nil	0	20	18.85	21.23
S2F111	>6 weeks	Nil	Nil	0	40	39.55	41.41
S2F112	>6 weeks	Nil	Nil	0	30	24.24	26.08
S2F211	>6 weeks	Nil	Nil	0	40	32.06	34.13
S2F212	>6 weeks	Nil	Nil	0	50	43.80	46.80
S1F111	>6 weeks	Nil	Nil	0	20	18.71	20.35
S1F112	>6 weeks	Nil	Nil	0	30	21.39	23.25
S1F211	>6 weeks	Nil	Nil	0	30	26.25	29.00
S1F212	>6 weeks	Nil	Nil	0	40	31.92	34.31
S2F111	>6 weeks	Nil	Nil	0	20	17.19	18.13
S2F112	>6 weeks	Nil	Nil	0	30	29.20	31.11
S2F211	>6 weeks	Nil	Nil	0	40	35.06	37.18
S2F212	>6 weeks	Nil	Nil	0	50	54.82	57.02

## As per technical programme 2015-16 (*Kharif* and hills)

### GENET. 1: EVALUATION OF GERMPLASM

#### 1.(a) Evaluation for adaptability in kharif season

One hundred tuberosum accessions including released varieties were evaluated in replicated trial at Dharwad (Karnataka) under *Kharif* season for adaptability and yield. Highest tuber yield was recorded by Bhulwa White (640 g/plant), followed by control variety, Kufri Surya (520g/plant), CPS 104 (480g/plant) and Rajendra-2 (460g/plant). The incidence of late blight were low in all the accessions (<6).

Location	:	Dharwad	Year	:	2016-17
Design	:	RBD	Spacing (cm)	:	60 X 20
Plot size	:	Single row	Plant to plant	:	20cm
Row to row	:	60cm	Date of planting	:	23.06.16
N:P:K dose	:	100:75:100	Date of haulm cutting	:	25.09.16
No of accession tested	:	9	Date of harvesting	:	02.10.16

**Table 440:** No of tubers/plant, size of tubers, total yield (gm/plant) and disease score at 75 DAP of different accession numbers

Sr no	Accession No/cultivar	Number of tubers/plant	Size of tubers	Total yield (gm)/plant	Disease score at 75 DAP
1.	J 11-33	3	Medium	200	3
2.	J 11-65	4	Medium	190	4
3.	J 11-191	4	Medium	300	3
4.	J 11-89	4	Medium	230	3
5.	J 11-45	2	Large	250	2
6.	J 11-193	3	Large and medium	240	4
7.	K Pukhraj	3	Medium	260	3
8.	K Surya	5	Large and medium	520	2
9.	P-23	5	Medium	370	2
10.	RH-2	4	Medium	360	2
11.	JX 455	2	Medium	210	2
12.	JF 4708	3	Large	400	2
13.	MF 1	4	Large	420	1
14.	CP 4401	5	Small	80	6
15.	CP 1559	3	Medium	220	5
16.	CP 2122	4	Small	200	4
17.	92/51 (J)	2	Medium	200	4
18.	DS/K 135	3	Large	450	3
19.	CP 2367	3	Large	420	3
20.	CP 4388	3	Medium and small	280	4
21.	CP 2429	2	Medium and small	160	4
22.	CP 4399	4	Medium and small	180	4
23.	Bonder Slake	4	Small	180	4
24.	HYB-3	2	Small	60	4
25.	JW 96	3	Small	100	5
26.	CP 147	3	Medium	140	4
27.	Rajendra-1	2	Small	60	4
28.	CP 2268	2	Large	240	3
29.	Rajendra	3	Medium	160	5
30.	Bhulwa White	5	Large	640	2
31.	CP 2375	2	Large	310	2
32.	CP 4393	4	Medium	240	4
33.	CP 4387	3	Medium	220	4
34.	CP 2210	2	Medium	180	5
35.	Krantz	1	Small	20	4

36.	CP 1198	2	Small	40	5
37.	B-921/621	2	Small	35	5
38.	Bhulwa Aloo	2	Medium	120	4
39.	G-4	2	Small	30	5
40.	JN 24	2	Small	40	5
41.	CP 1488	3	Small	160	4
42.	Rajendra-2	4	Large	460	3
43.	Cluster torch	3	Large	250	4
44.	Alpha	Germination/establishment problem			
45.	B-24	Germination/establishment problem			
46.	B/SC/68	5	Small	50	6
47.	CP 4398	2	Small	20	5
48.	CPS 1071	2	Small	30	5
49.	Avenior	1	Small	15	4
50.	JX-123	2	Small	40	4
51.	Deshalo Saled	2	Medium	120	5
52.	CP 1396	3	Small	60	4
53.	CP 1810	Germination/establishment problem			
54.	Deshalo Pal	2	Small	45	5
55.	ON 1645	1	Medium	40	4
56.	CP 4392	3	Small	80	4
57.	A. Calbel	3	Large	280	3
58.	B 420	4	Small	50	4
59.	President	1	Medium	35	4
60.	SE/D/5	2	Small	20	3
61.	PS/M 98	4	Very small	55	4
62.	CP 1567	3	Medium	120	4
63.	CP 2285	3	Medium	140	4
64.	CP 4402	4	Small	60	4
65.	SL/82-482	4	Very small	48	5
66.	CP 1446	2	Large	410	3
67.	B/2/7/F-6	1	Medium	50	5
68.	Raja	2	Medium	120	4
69.	CPS-13	Germination/establishment problem			
70.	Bhura aloo-1	3	Small	80	4
71.	CP-1430	3	Small	30	5
72.	CP 4405	2	Small	20	4
73.	Red flash	3	Medium	220	3
74.	CP 1653	3	Medium	140	4
75.	Hellora	3	Medium	200	4
76.	CP 1356	2	Medium	120	3
77.	Desi Rec	4	Small	50	6
78.	CP 1397	3	Medium	100	4
79.	CP 2189	2	Small	60	4
80.	CP 4390	4	Small	90	5
81.	CPS 104	3	Long and medium	480	3
82.	CP 1590	3	Medium	240	5
83.	Garlantic	Germination/establishment problem			
84.	No Label	3	Medium	140	4
85.	No Label	Germination/establishment problem			
86.	C-11	2	Small	80	4
87.	C-11	2	Medium	210	5
88.	C-11	2	Medium	120	4
89.	C-11	1	Small	20	3
90.	C-11	Germination/establishment problem			
91.	No Label	2	Long and medium	420	3
92.	No Label	Germination/establishment problem			
93.	No Label	2	Medium and small	210	3
94.	No Label	Germination/establishment problem			
95.	No Label	3	Small	160	3

96.	No Label	4	Medium and small	360	3
97.	No Label	3	Medium and small	220	4
98.	No Label	2	Medium	300	2
99.	No Label	2	Medium	240	2
100.	No Label	5	Medium	210	5

### 1.(a) Evaluation for adaptability in kharif season

Seventy-two tuberosum accessions were evaluated in replicated trials at Hassan (Karnataka) under *kharif* season for adaptability and yield. Three highest yielding accessions were CP-1987, CP-2099 and CP-2116 with total yield 0.87kg, 0.81kg and 0.75kg, respectively. All these three accessions were resistant (15% incidence) to late blight disease. The incidence of viral diseases (<10%) was also low in these three accessions.

Location	:	Hassan	Year	:	2016-17
Design	:	RBD	Replication	:	2
Plot size	:	5 tuber row	Spacing (cm)	:	60 X 20
Row to row	:	60cm	Date of planting	:	26.05.16
N:P:K dose	:	75:75:100	Date of haulm cutting	:	14.08.16
No of accession tested	:	72	Date of harvesting	:	24.08.16

**Table 441:** Percent emergence, foliage senescence (%), plant height (cm), total yield (kg), no of tubers/plant, late blight (%), intensity of late blight and viral diseases (%) of different accession numbers

Sr no	Accession No/cultivar	Emergence (%)	Foliage senescence (%)	Plant height (cm)	Total yield (kg)	No of tubers/plant	Late blight (%)	Intensity of Late Blight	Viral Diseases (%)
1.	CP-2065	30	80	45	0.26	4	20	9	25
2.	CP-2192	10	90	33	0.08	2	20	9	65
3.	CP-2018	40	80	51	0.11	3	20	9	25
4.	CP-2173	40	80	44	0.29	5	20	8	32
5.	CP-2011	30	90	35	0.18	4	20	9	20
6.	CP-2159	30	90	42	0.24	5	15	9	25
7.	CP-2310	85	90	51	0.49	6	15	9	15
8.	CP-2287	10	95	43	0.37	5	20	9	10
9.	CP-2171	50	100	49	0.34	6	15	9	20
10.	CP-1982	70	100	56	0.56	8	20	8	21
11.	CP-2201	40	90	45	0.36	5	20	8	17
12.	CP-1986	60	90	53	0.55	7	20	8	15
13.	CP-2293	40	80	32	0.22	4	20	8	16
14.	CP-2060	50	95	21	0.03	2	20	8	32
15.	CP-2218	40	100	26	0.11	3	20	9	16
16.	CP-2191	60	95	31	0.16	4	20	8	15
17.	CP-2143	70	85	45	0.67	6	20	9	10
18.	CP-1997	70	90	53	0.66	8	20	9	11
19.	CP-2002	30	90	55	0.68	9	15	9	15
20.	CP-2117	90	100	51	0.71	8	15	9	10
21.	CP-2041	70	90	39	0.18	4	20	9	26
22.	CP-2282	70	100	26	0.03	3	15	9	30
23.	CP-2054	40	90	30	0.06	3	20	9	32
24.	CP-2178	50	100	32	0.20	5	20	8	20
25.	CP-2305	0	95	29	0.06	3	20	9	35
26.	CP-2051	10	100	33	0.19	4	15	9	15
27.	CP-2281	50	100	34	0.35	5	20	8	24
28.	CP-2015	80	80	39	0.42	6	20	8	36
29.	CP-2089	20	90	53	0.55	6	15	9	12
30.	CP-1990	60	90	36	0.27	5	20	9	21
31.	CP-2086	70	95	31	0.19	4	20	8	26
32.	CP-2133	50	100	39	0.46	8	20	8	15
33.	CP-2053	50	95	42	0.27	5	20	8	20

34.	CP-2066	70	100	44	0.33	5	20	9	13
35.	CP-2237	50	95	36	0.22	6	20	9	27
36.	CP-2072	60	100	30	0.03	4	20	9	50
37.	CP-2197	85	90	32	0.37	6	15	9	23
38.	CP-2268	85	95	36	0.32	6	15	9	26
39.	CP-1987	50	100	53	0.87	10	15	9	10
40.	CP-2099	30	90	58	0.81	9	15	9	0
41.	CP-2141	30	90	46	0.42	5	10	9	12
42.	CP-2040	85	95	49	0.39	6	10	9	16
43.	CP-2093	70	100	36	0.17	5	20	9	20
44.	CP-2210	40	100	33	0.30	5	20	8	20
45.	CP-2235	20	80	39	0.26	6	20	8	15
46.	CP-2170	30	90	37	0.19	5	15	9	25
47.	CP-2116	80	80	52	0.75	8	15	9	10
48.	CP-2167	85	85	29	0.10	4	-	9	25
49.	CP-2246	60	90	34	0.20	5	10	9	20
50.	CP-2016	85	90	30	0.25	6	10	9	16
51.	CP-2142	60	90	26	0.05	3	15	9	19
52.	CP-2134	90	95	39	0.29	5	15	9	20
53.	CP-2071	40	80	37	0.22	5	15	9	20
54.	CP-2006	80	95	33	0.21	6	20	8	20
55.	CP-2320	75	95	63	0.91	10	20	9	10
56.	CP-2084	70	85	26	0.17	4	20	8	19
57.	CP-2129	60	90	30	0.14	5	15	9	22
58.	CP-2042	40	80	50	0.52	9	20	8	26
59.	CP-2044	40	100	52	0.41	8	20	8	25
60.	CP-2069	20	90	41	0.24	6	20	9	15
61.	CP-2315	70	100	26	0.12	4	20	8	36
62.	CP-2085	85	100	23	0.02	3	20	9	42
63.	CP-2314	30	100	39	0.13	3	20	8	21
64.	CP-2320	50	100	38	0.32	5	20	8	25
65.	CP-2135	60	95	26	0.11	6	20	8	32
66.	CP-2082	45	90	45	0.42	8	15	9	17
67.	CP-2300	60	95	35	0.07	4	15	9	40
68.	CP-2172	90	80	36	0.21	6	15	9	23
69.	CP-2236	50	90	25	0.02	2	20	9	22
70.	CP-2161	90	90	46	0.43	5	20	8	21
71.	CP-2380	60	100	32	0.22	6	20	8	25
72.	CP-2312	70	90	34	0.04	3	15	9	40

### GENET. 3: BREEDING PROGRAMMES AT SAU BASED CENTERS

#### SRINAGAR

- a) In the SAU based breeding at Srinagar station the selected F<sub>1</sub>C<sub>2</sub> clones of 2015 were re-evaluated in 2016 and in F<sub>1</sub>C<sub>3</sub> generation, 7 clones of six different crosses were evaluated and 7 clones were selected.
- b) In F<sub>1</sub>C<sub>4</sub> generation, 1 clone of cross CP2378 x Local Pahalgam (AICRPSK-11) was evaluated and one clone was selected.
- c) In hybridization, ten fresh crosses were attempted at high altitude station, Gurez and Yarikha.

**A. Breeding programme at Kufri:** The crosses performed at CPRI Kufri were evaluated at Srinagar centre during 2016 and the performance report is as under

**Table 442:** Performance in other stages of evaluation

Stage/Cross	Number of Genotypes planted	No. of genotypes planted	Number of genotypes selected
F1C3	CP 3605 x CP 2132	1	1
F1C3	CP 3587 x CP 2340	1	1
F1C3	CP 3763 x CP 2340	2	2
F1C3	CP3770x K.Pukhraj	1	1
F1C3	CP 3764 x CP 2340	1	1
F1C3	CP3612x K.Pukhraj	1	1

#### B. Station Breeding Programme:

The trial is being conducted at Yarikha and Gurez with the objective to perform crosses for high yield and blight resistance. About ten crosses were attempted during 2016 at high altitude station among the desirable genotypes

**Table 443:** Performance in other stages of evaluation

Stage/Cross	No of genotypes planted	No of genotypes selected
(F1C4)		
CP2378 x Local Pahalgam (AICRPSK-11)	1	1



## GENET. 4: ON FARM TRIAL WITH EARLY AND MEDIUM MATURING HYBRIDS

One hybrid, MS/6-1947 with controls, Kufri Pukhraj, Kufri Jyoti, Kufri Laukar, Kufri Bahar, Kufri Khyati, Kufri Surya and Kufri Himalini were evaluated in on- farm trials at 3 locations viz., Dharwad during 90 days crop duration, Hassan during 60, 75 and 90 days crop duration and Pune during 60 and 75 days crop durations. The plant emergence was normal at all three locations except for MS/6-1947 and Kufri Pukhraj at Hassan, which was slightly less than 80 per cent.

Kufri Himalini was the best control total and marketable tuber yields at Dharwad and Hassan, while Kufri Pukhraj was found to be the best control at Pune. The advanced hybrid, MS/6-1947 could not outyield the best control at any location in any crop durations. The late blight incidence ranged from 5.64-41.11%, Kufri Himalini had the least incidence (5.64-15.27%) and the hybrid had incidence ranging from 11.7-30.69%. Late blight did not appear at Pune. Virus incidence was minimal at Pune (2.04-2.17%). Leaf spot disease was recorded only at Pune (2.17-10.64%). Storage studies were conducted at Hassan and Pune and the total weight loss due to sprouting and rotting after 3 months of storage was at par in hybrid (MS/6-1947) and control varieties.

**Table 444:** Experimental details

Experimental detail/Centre	DWD	HSN	PUN
Year	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD
Replication/Location	3	-	3
Plot size (gross) m <sup>2</sup>	96.0	7.20	9.00
Spacing (cm)	60x20	60x20	60x20
Planting date	24.06.16	08.06.16	01.07.16
Dehauling date 60 DAP	-	07.08.16	22.08.16
75 DAP	-	12.08.16	07.09.16
90 DAP	26.09.16	27.08.16	-
105 DAP	-	-	-
Harvesting date 60 DAP	-	18.08.16	01.09.16
75 DAP	-	22.08.16	14.09.16
90 DAP	06.10.16	06.09.16	-
105 DAP	-	-	-
Duration of crop (days)	90	60, 75 & 90	60 & 75

### DHARWAD

**Table 445:** Plant emergence (%), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and late blight (%) in 90 days crop

Hybrid/variety	Emergence (%)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Late Blight (%)
MS/6-1947	99.25	90.00	9.50	7.89	1.61	20.0
K Khyati	90.75	20.00	11.06	9.47	1.59	30.0
K Pukhraj	98.63	20.00	17.76	16.16	1.59	30.0
K Bahar	93.50	90.00	10.38	9.89	0.48	20.0
K Himalini	92.63	90.00	25.31	23.47	1.85	40.0
K Jyoti	88.50	30.00	11.62	10.25	1.37	40.0

**Table 446:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/cultivar	Initial weight of tubers (Kg)	Final weight (Total)	Weight of healthy tubers
MS/6-1947	5	4.8	3.2
K Khyati	5	4.5	3.6
K Pukhraj	5	4.7	3.4
K Bahar	5	5.0	4.1

K Himalini	5	4.8	3.1
K Jyoti	5	4.4	3.0

## HASSAN

**Table 447:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and dry matter (%) in 60 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MS/6-1947	73.88	5.31	0.00	15.71	12.86	0.86	16.03
K Jyoti	78.44	2.81	0.00	14.80	11.82	0.56	17.39
K Pukhraj	76.00	6.54	0.00	10.89	7.75	0.75	17.82
K Surya	89.00	5.78	10.00	15.50	13.00	0.68	14.81
K Himalini	84.75	6.92	0.00	17.06	14.58	0.47	18.28

**Table 448:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MS/6-1947	76.51	5.42	50.00	18.97	16.25	1.23	18.18
K Jyoti	81.19	4.25	30.00	16.71	13.94	0.51	19.01
K Pukhraj	79.06	6.72	40.00	14.33	11.01	0.99	19.20
K Surya	87.69	6.60	70.00	18.31	15.52	0.81	16.14
K Himalini	80.56	6.12	40.00	19.92	17.08	0.69	19.65

**Table 449:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and dry matter (%) in 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MS/6-1947	76.25	4.90	80.00	19.87	16.83	1.35	19.79
K Jyoti	80.94	3.87	75.00	18.58	15.28	0.74	20.00
K Pukhraj	79.28	5.79	80.00	15.04	12.58	1.22	21.20
K Surya	88.43	6.34	100.00	20.08	17.47	1.20	17.84
K Himalini	82.23	6.81	77.50	21.18	18.08	1.03	21.50

**Table 450:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
MS/6-1947	30.69	0	0	25.13	0	0	11.7	0	0
K Jyoti	22.37	0	0	20.12	0	0	9.15	0	0
K Pukhraj	41.11	0	0	37.61	0	0	17.27	0	0
K Surya	35.79	0	0	28.37	0	0	16.67	0	0
K Himalini	15.27	0	0	10.27	0	0	5.64	0	0

**Table 451:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rotting		Total wt. Losses (%)
		At 6 weeks	End of storage (90 days)		Number basis	Weight basis	
MS/6-1947	> 6 weeks	nil	100	6	5	6	12
K Jyoti	> 6 weeks	nil	100	5	6	5	10
K Pukhraj	> 6 weeks	nil	100	5	5	6	11
K Surya	> 6 weeks	10	100	6	5	6	12
K Himalini	< 6 weeks	nil	100	5	5	5	10

**PUNE****Table 452:** Plant emergence (%), seed wt. (t/ha), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and dry matter (%) in 60 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MS/6-1947	87.00	2.35	10.80	9.07	1.72	18.07
K Bahar	90.00	2.45	10.45	9.70	0.74	16.55
K Jyoti	93.89	2.72	12.40	11.08	1.31	16.73
K Laukar	95.00	2.94	11.50	10.09	1.41	16.37
K Pukhraj	96.78	1.91	13.89	12.98	0.91	16.90
K Surya	92.55	1.96	11.87	10.59	1.28	17.73
K Himalini	88.00	2.00	11.00	9.48	1.52	16.90
SEd	1.77	0.10	0.23	0.24	0.08	0.80
CD (0.05)	3.91	0.22	0.51	0.53	0.17	NS
CV (%)	2.36	5.32	2.44	2.81	7.46	5.74

**Table 453:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and dry matter (%) in 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MS/6-1947	88.00	2.37	69.33	12.28	9.91	2.37	18.33
K Bahar	91.00	2.41	74.67	15.33	13.80	1.54	16.47
K Jyoti	93.11	2.76	76.33	15.24	13.50	1.74	16.73
K Laukar	96.00	2.91	73.33	16.09	13.70	2.39	16.40
K Pukhraj	95.44	1.99	71.33	18.00	16.24	1.76	17.73
K Surya	92.67	2.07	72.00	12.92	11.44	1.48	16.47
K Himalini	88.67	2.15	72.67	13.05	10.89	2.17	17.25
SEd	1.20	0.12	1.44	0.87	0.92	0.16	0.66
CD (0.05)	2.63	0.26	3.17	1.92	2.03	0.36	NS
CV (%)	1.59	6.00	2.42	7.25	8.85	10.32	4.71

**Table 454:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days		
MS/6-1947	Did not appear	4.17	0.00	Did not appear	8.33	2.08
K Bahar		6.38	0.00		10.64	0.00
K Jyoti		4.17	0.00		6.25	0.00
K Laukar		4.08	0.00		6.12	0.00
K Pukhraj		6.13	2.04		8.18	2.04
K Surya		4.08	2.04		8.16	0.00
K Himalini		2.17	2.17		4.35	2.17

**Table 455:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90 days)		Number basis	Weight basis	
MS/6-1947	> 6 weeks	0	0	0	1	50	2.5
K Bahar	> 6 weeks	0	0	0	2	84	4.2
K Jyoti	> 6 weeks	0	0	0	2	80	4.0
K Laukar	> 6 weeks	0	0	0	3	95	4.75
K Pukhraj	< 6 weeks	0	0	0	1	40	2.0
K Surya	< 6 weeks	0	0	0	3	98	4.9
K Himalini	< 6 weeks	0	0	0	2	60	3.0

## GENET. 5: TRIAL WITH TABLE POTATO HYBRIDS (1<sup>st</sup> & 2<sup>nd</sup> years)

Eight advanced potato hybrids viz., MS/7-645, PS/5-75, MS/8-1148, MS/9-723, MS/5-1545, MS/9-2196, J/7-37, J/6-182 and controls, Kufri Pukhraj, Kufri Jyoti, Kufri Surya, Kufri Himalini, Kufri Khyati, Kufri Garima, Kufri Lalima, Kufri Bahar, Kufri Badshah and Kufri Sadabahar were evaluated at 3 locations viz., Dharwad for 75 & 90 days crop duration, Hassan for 60, 75 & 90 days crop durations and Pune for 75 & 90 days. At Hassan plant emergence was low in all the hybrids and few control varieties (<80%). The best control for total and marketable tuber yields was Kufri Pukhraj at Dharwad, Kufri Himalini at Hassan, while Kufri Surya was the best for both the yields at Pune. None of the hybrid could outyield the best control at any location except for at Pune where PS/5-75 was at par to the best control for both the yields in 75 days crop duration.

Late blight disease appeared at all 3 locations, though low incidence was recorded in all hybrids and controls at Dharwad and Pune. At Hassan the late blight incidence ranged between 21.80-48.72% at 60 days crop duration, 10.53-51.35% in 75 days crop duration and 13.64-34.28% at 90 days crop duration. Among controls, K. Jyoti at 60 & 75 days and Kufri Surya at 90 days crop duration had the least incidence (35%) and all hybrids except had higher late blight incidence than the best control. Viral and leaf spot diseases were recorded at Hassan and Pune. No virus symptoms were observed in MS/7-645, PS/5-75 and MS/09-2196 at Hassan. At Pune, genotype MS/7-645 and MS/8-1148 had no virus infection. Foliage senescence was recorded at all the three locations. At Dharwad and Hassan, none of the hybrids had higher senescence than the best controls, whereas at Pune, MS/7-645 and PS/5-75 at 75 days crop duration were better for foliage senescence than the best control. No considerable differences were observed for total weight loss in storage studies at Hassan and Pune.

**Table 456:** Experimental details

Experimental detail/Centre	DWD	HSN	PUN
Year	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD
Replication	4	4	3
Plot size (m <sup>2</sup> )	7.20	7.20	7.20
Spacing (cm)	60x20	60x20	60x20
Planting date	23.06.17	07.06.16	01.07.16
Dehauling date	60 DAP	-	27.07.16
	75DAP	11.09.16	11.08.16
	90 DAP	25.09.16	26.08.16
Harvesting date	60 DAP	-	06.08.16
	75 DAP	18.09.16	21.08.16
	90 DAP	02.10.16	05.19.16
Duration of crop (days)	75 & 90	60,75 & 90	75 & 90
NPK dose (kg/ha)	100:75:100	75:75:100	150:60:120

### DHARWAD

**Table 457:** Plant emergence (%), total, marketable and weight of rotten tuber yield (t/ha) in 75 days crop.

Hybrid/variety	Emergence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Foliage Senescence (%)
MS/7-645	97.22	26.51	26.03	0.48	40.00
PS/5-75	94.79	22.38	22.09	0.29	11.25
MS/8-1148	88.19	9.24	9.07	0.17	7.50
MS/9-723	89.93	9.71	9.53	0.18	22.50
K Khyati	85.76	15.25	14.91	0.34	6.25
K Pukhraj	97.22	37.40	36.66	0.74	11.25
K Bahar	92.36	22.11	22.02	0.09	52.50
K Lalima	91.32	24.91	24.43	0.48	10.00
K Surya	93.40	27.61	27.10	0.51	17.50
K Himalini	91.32	22.89	21.92	0.97	51.25
SEd	4.03	1.69	1.58	0.28	3.83
CD (0.05)	NS	3.49	3.26	NS	7.89
CV (%)	6.19	10.98	10.46	92.65	23.52

**Table 458:** Plant emergence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers, foliage senescence (%) and late blight (1-9 score) in 90 days crop.

Hybrid/ variety	Emergence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Foliage senescence (%)	Late blight (1-9 score)
MS/7-645	92.71	27.40	26.00	1.40	45.75	3
PS/5-75	96.87	27.70	27.02	0.68	7.50	0
MS/8-1148	85.07	10.45	10.02	0.43	8.75	2
MS/9-723	89.93	14.45	13.31	1.14	33.75	0
K Khyati	84.38	16.62	15.85	0.77	8.75	0
K Pukhraj	97.57	40.41	38.84	1.56	15.00	0
K Bahar	93.40	23.49	22.87	0.62	77.50	0
K Lalima	88.89	30.77	30.55	0.22	7.50	0
K Surya	95.14	28.20	27.28	0.92	22.50	2
K Himalini	89.93	25.65	24.59	1.06	52.50	3
SEd	2.53	1.79	1.71	0.39	3.79	
CD (0.05)	5.21	3.69	3.53	0.80	7.81	
CV (%)	3.91	10.32	10.23	62.62	19.17	

#### HASSAN

**Table 459:** Plant emergence (%), seed wt.(t/ha), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 60 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/5-1543	72.83	2.77	8.54	7.22	0.89	14.16
MS/7-645	79.00	2.89	7.26	5.73	0.84	13.28
PS/5-75	74.00	2.69	7.15	5.64	0.54	18.00
MS/8-1148	71.56	2.96	6.96	5.61	0.55	13.19
MS/9-2196	70.08	3.94	7.42	5.85	0.43	11.45
J/7-37	73.75	2.69	5.42	4.49	0.35	9.96
K Badshah	80.08	2.69	8.04	6.56	0.80	10.28
K Bahar	76.67	2.58	13.92	11.43	0.86	10.94
K Jyoti	76.46	3.61	16.01	12.68	0.40	16.37
K Pukhraj	78.50	2.60	15.80	12.65	0.66	17.68
K Sadabahar	70.08	2.82	9.73	8.65	0.68	15.55
K Surya	84.67	1.99	16.88	14.20	0.58	15.85
K Himalini	81.17	2.78	18.04	17.22	14.48	18.04
K Garima	80.00	2.78	18.75	6.04	5.62	18.75
SEd	3.16	0.43	0.61	0.77	0.78	0.61
CD (0.05)	6.42	0.88	1.25	1.57	1.59	1.25
CV (%)	5.86	21.56	5.98	10.43	12.80	5.98

**Table 460:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 75 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/5-1543	76.00	2.81	27.50	11.21	8.53	0.98	15.32
MS/7-645	79.84	3.47	12.50	8.67	6.81	1.19	14.61
PS/5-75	75.50	2.97	47.50	8.58	5.86	0.66	19.92
MS/8-1148	71.25	3.42	20.00	9.80	7.32	0.86	14.21
MS/9-2196	72.42	3.37	37.50	9.89	7.53	0.47	13.26
J/7-37	75.17	1.98	10.00	6.89	5.76	0.38	10.67
K Badshah	85.33	3.06	37.50	9.95	8.10	1.15	11.63
K Bahar	80.92	2.24	50.00	15.66	13.24	1.16	12.15
K Jyoti	76.75	4.38	50.00	16.96	14.97	0.64	18.37
K Pukhraj	82.25	2.72	42.50	17.09	15.30	1.07	18.55

K Sadabahar	70.92	3.34	20.00	11.51	9.57	1.05	16.27
K Surya	88.67	2.06	70.00	18.15	16.96	0.89	16.33
K Himalini	86.92	2.73	50.00	19.30	17.64	0.88	19.67
K Garima	80.25	3.03	30.00	8.31	7.09	0.46	19.71
SEd	4.00	0.49	3.26	1.19	1.36	0.10	0.57
CD (0.05)	8.12	1.00	6.62	2.41	2.77	0.20	1.15
CV (%)	7.18	23.47	12.78	13.69	18.65	16.09	5.07

**Table 461:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 90 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/5-1543	81.50	3.10	50.00	14.19	12.08	0.98	17.01
MS/7-645	78.75	3.85	32.50	10.56	8.51	1.32	16.55
PS/5-75	75.59	3.07	70.00	12.58	9.12	0.57	20.54
MS/8-1148	78.92	3.23	30.00	13.28	10.48	1.01	16.21
MS/9-2196	74.09	4.11	50.00	12.27	10.36	0.70	15.00
J/7-37	80.09	2.57	30.00	7.72	7.06	0.43	12.10
K Badshah	86.34	2.59	57.50	12.96	10.73	1.52	13.11
K Bahar	80.75	2.75	70.00	18.98	16.32	1.37	13.45
K Jyoti	77.08	4.43	57.50	21.16	18.09	0.70	19.26
K Pukhraj	81.17	2.88	52.50	20.74	18.21	1.04	19.85
K Sadabahar	74.00	3.56	40.00	14.70	12.47	1.18	17.37
K Surya	95.00	2.39	92.50	21.47	18.79	0.94	17.89
K Himalini	90.08	2.93	72.50	22.64	20.09	0.71	20.16
K Garima	83.42	3.18	40.00	10.83	9.43	0.52	20.63
SEd	6.00	0.49	3.66	1.89	1.44	0.13	0.93
CD (0.05)	12.18	1.00	7.42	3.83	2.93	0.25	1.89
CV (%)	10.45	21.84	9.72	17.45	15.70	19.06	7.71

**Table 462:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
MS/5-1543	36.36	2	0	29.54	5	0	24.44	3	8.89
MS/7-645	24.49	2	0	27.03	0	0	34.09	4	0
PS/5-75	28.26	0	0	10.53	0	0	34.21	0	0
MS/8-1148	48.72	0	0	23.91	0	0	26.32	0	1
MS/9-2196	38.71	0	0	51.35	0	0	34.28	5	0
J/7-37	31.11	0	0	14.28	0	0	27.02	0	5.41
K Badshah	26.92	2	0	20.51	2	0	25.53	0	12.76
K Bahar	36.17	0	0	26.67	3	0	33.33	0	6.67
K Jyoti	21.81	0	0	20.37	0	0	31.11	2	13.33
K Pukhraj	36.00	2	0	22.73	3	0	14.63	1	0
K Sadabahar	39.47	2	0	21.43	2	0	23.81	2	1.67
K Surya	32.00	3	0	32.5	2	0	13.64	2	0
K Himalini	33.33	0	0	23.09	0	0	26.19	0	0
K Garima	26.00	0	0	37.5	0	0	20.45	0	0

**Table 463:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( days)		Number basis	Weight basis	
MS/5-1543	> 6 week	nil	100	6	5	8	14
MS/7-645	> 6 week	nil	100	5	5	6	11
PS/5-75	> 6 week	nil	100	6	7	8	14
MS/8-1148	> 6 week	nil	100	5	5	8	13
MS/9-2196	> 6 week	nil	100	7	8	7	14
J/7-37	> 6 week	nil	100	8	9	9	17
K Badshah	> 6 week	nil	100	6	7	7	13
K Bahar	< 6 week	nil	100	5	5	6	11
K Jyoti	> 6 week	nil	100	6	5	4	10
K Pukhraj	> 6 week	nil	100	5	6	6	11
K Sadabahar	> 6 week	nil	100	6	7	8	14
K Surya	> 6 week	10	100	10	8	6	16
K Himalini	> 6 week	nil	100	5	6	6	11
K Garima	> 6 week	nil	100	8	7	7	15

**PUNE****Table 464:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 75 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/7-645	96.00	2.52	65.67	9.30	8.24	1.02	15.45
PS/5-75	91.67	2.69	64.00	13.59	12.68	0.91	16.03
J/6-182	93.33	3.09	63.33	10.39	9.55	0.83	16.03
MS/8-1148	94.44	2.61	62.00	9.66	8.65	1.02	16.59
K Jyoti	93.67	2.91	62.00	10.98	9.59	1.39	15.83
K Pukhraj	96.33	2.80	63.00	12.55	11.30	1.26	15.96
K Surya	94.33	2.85	61.67	12.80	12.58	1.37	16.00
SEd	0.89	0.07	1.23	0.52	0.62	0.08	0.22
CD (0.05)	1.97	0.16	NS	1.15	1.37	0.19	0.49
CV (%)	1.16	3.20	2.39	5.67	7.35	9.21	1.71

**Table 465:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 90 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/7-645	95.00	2.58	71.67	11.46	10.26	1.20	15.98
PS/5-75	92.67	2.67	73.67	14.16	13.11	1.06	16.65
J/6-182	90.67	2.98	72.33	14.66	13.05	1.24	16.52
MS/8-1148	93.00	2.63	73.00	11.87	10.56	1.31	17.20
K Jyoti	94.33	2.87	73.67	13.26	12.06	1.20	16.52
K Pukhraj	93.67	2.76	72.33	14.87	13.72	1.15	16.40
K Surya	95.00	2.65	72.67	15.65	14.12	1.50	16.27
SEd	0.94	0.12	0.90	0.48	0.49	0.11	0.16
CD (0.05)	2.08	NS	NS	1.06	1.08	0.24	0.36
CV (%)	1.24	5.53	1.51	4.28	4.83	10.97	1.21



**Table 466:** Disease reaction

Hybrid/variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	75days			90 days		
MS/7-645	Did not appear	15.56	0.00	2.22	22.22	0.00
PS/5-75		14.58	2.08	2.08	16.67	2.08
J/6-182		19.15	2.13	6.38	25.53	2.13
MS/8-1148		14.00	0.00	10.00	18.00	0.00
K Jyoti		25.53	4.26	4.26	26.09	4.35
K Pukhraj		20.83	2.08	0.00	27.08	2.08
K Surya		23.40	2.13	2.13	23.40	2.13

**Table 467:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( days)		Number basis	Weight basis	
MS/7-645	> 6 weeks	0	0	0	2	72	3.6
PS/5-75	> 6 weeks	0	0	0	3	88	4.4
J/6-182	> 6 weeks	0	0	0	2	70	3.5
MS/8-1148	> 6 weeks	0	0	0	2	78	3.9
K Jyoti	> 6 weeks	0	0	0	3	94	4.7
K Pukhraj	> 6 weeks	0	0	0	3	95	4.8
K Surya	> 6 weeks	0	0	0	2	55	2.8

## GENET. 6: TRIAL WITH HILL & KHARIF POTATO HYBRIDS

Three hybrids namely SM/00-42, SM/00-120, VMT 5-1 with controls viz., Kufri Girdhari, Kufri Himalini and Kufri Jyoti at 120 days crop duration at Kufri and Ooty, although the advanced hybrid, LBY-17 was also evaluated at Ooty; three hybrids namely MP/9-723, VMT 5-1 and MP/4-816 with five controls K Pukhraj, Kufri Jyoti, K Khyati, Kufri Surya and Kufri Himalini at 75 and 90 days crop duration at Dharwad; five hybrids namely MS/9-723, SM/00-42, SM/00-120, VMT 5-1 and LBY-17 with four controls Kufri Jyoti, Kufri Pukhraj, Kufri Surya and Kufri Himalini at 60, 75 and 90 days crop duration at Hassan; one hybrid MP/9-723 with five controls namely Kufri Jyoti, Kufri Laukar, Kufri Pukhraj, Kufri Surya and Kufri Himalini at 75 and 90 days crop duration at Pune; four hybrids namely SM/00-42, SM/00-120, VMT 5-1 and LBY-17 with three controls Kufri Jyoti, Kufri Girdhari and Kufri Himalini at 60 and 90 days duration at Shillong; four hybrids namely SM/00-42, SM/00-120, VMT 5-1, LBY-17 with three controls Kufri Girdhari, Kufri Himalini and Kufri Jyoti at 120 days crop duration at Srinagar were evaluated. The plant emergence was normal at all the locations except for SM/00-120 (67.59) and Kufri Girdhari (65.74) at 90 days crop duration in Shillong.

The hybrid SM/00-42 significantly out-yielded best control variety K. Girdhari for total tuber yields at Kufri and also produced higher marketable yield at 120 days crop duration. SM/00-42 also out-yielded best control K. Himalini for total as well as marketable yield at 60, 75 and 90 days crop durations at Hassan, and at 90 days at Ranichauri. It also produced higher total and marketable tuber yield than the best control at 75 and 90 days at Shillong. None of the other hybrids were better than the control genotypes at their respective locations.

Late blight incidence was recorded at all locations viz., Hassan, Kufri, Ranichauri, Shillong and Srinagar. K. Himalini was the best control for late blight incidence at Hassan and Ranichauri, while, K. Girdhari was the best control at Kufri, Shillong and Srinagar. The hybrid SM/00-42 was resistant to late blight and observed either higher or at par resistance to the best controls at Kufri, Ranichauri and Hassan.

Foliage senescence was recorded at locations viz., Dharwad, Hassan, Kufri, Pune and Srinagar. The hybrid SM/00-42 observed at par foliage senescence to best check K. Jyoti at Kufri.

Storage studies were conducted at Hassan, Kufri, Pune and Srinagar. The hybrid SM/00-42 recorded least weight loss at Kufri in comparison to other hybrids and controls. In other locations there were no considerable differences among hybrids and controls for weight loss.

**Table 468:** Experimental details

Centre	DWD	HSN	KFI	OOT	PUN	RNC	SHI	SRI
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD	RBD	RBD	RBD
Replication	3	6	4	4	3	3	4	4
Plot size(m <sup>2</sup> )	7.2	7.2	6.0	7.2	9.0	7.2	7.2	7.2
Spacing (cm)	60 x 20	60 x 20	60 x 20	60 x 20	60 x 20	60 x 20	60 x 20	60 x 20
Planting	24.06.16	11.06.16	20.05.16	29.04.16	01.07.16	10.09.16	-	29.03.16
Dehauling date 60 DAP	-	30.07.16			-	-	-	-
75DAP	10.09.16	15.08.16			17.09.16	-	-	-
90 DAP	01.10.16	30.08.16			25.09.16	-	-	-
105/120DAP	-	-	20.09.16		-	-	-	-
Harvesting date 60DAP	-	10.08.16			-		26.05.16	-
75DAP	20.09.16	25.08.16			25.09.16	-	10.06.16	-
90 DAP	08.10.16	09.09.16			10.10.16	-	26.06.16	-
105/120DAP	-	-	15.10.16	29.09.16	-	21.12.16	-	07.08.16
N:P:K dose (kg/ha)	100:75:100	75:75:100			-	150:100:80	120:60:60	160:100:100
Duration of crop (days)	75 & 90	60, 75 & 90	120	120	75 & 90	100	60, 75 & 90	120

## DHARWAD

**Table 469:** Plant emergence (%), total & marketable tuber yield (t/ha) and weight (t/ha) of rotten tubers in 75 days crop.

Hybrid/ variety	Emergence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)
MS/9-723	93.89	11.75	11.49	0.26
VMT 5-1	92.78	11.27	10.96	0.31
MP/4-816	92.22	17.68	17.66	0.02
K Pukhraj	93.34	37.05	36.55	0.50
K Jyoti	94.44	15.53	14.99	0.55
K Khyati	93.89	18.04	17.52	0.52
K Surya	94.44	25.47	25.19	0.29
K Himalini	97.22	25.06	24.32	0.75
SEd	2.64	2.30	2.37	0.29
CD (0.05)	NS	4.97	5.13	NS
CV (%)	3.43	13.90	14.62	89.80

**Table 470:** Plant emergence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and foliage senescence (%) in 90 days crop.

Hybrid/ variety	Emergence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Foliage senescence (%)
MS/9-723	94.44	16.98	16.50	0.47	25.00
VMT 5-1	94.45	16.07	15.59	0.47	26.67
MP/4-816	95.00	9.85	8.35	1.50	36.67
K Pukhraj	93.89	46.21	45.63	0.58	11.67
K Jyoti	93.89	17.99	17.42	0.57	36.67
K Khyati	92.22	19.32	18.50	0.81	18.33
K Surya	92.22	26.74	25.58	1.16	11.67
K Himalini	91.11	28.44	27.69	0.74	80.00
SEd	2.87	2.11	2.08	0.31	2.65
CD (0.05)	NS	4.56	4.50	NS	5.75
CV (%)	3.77	11.36	11.61	48.33	10.54

**Table 471:** Late blight incidence at 10 days intervals after 1<sup>st</sup> appearance of disease.

Hybrid/ variety	Date of first appearance of late blight	Disease incidence at 10 days interval (1-9 scale) after the first appearance		
		14.09.16	24.09.16	04.10.16
MS/9-723	14.09.16	0	2	5
VMT 5-1		0	1	3
MP/4-816		0	0	1
K Pukhraj		1	1	3
K Jyoti		1	3	5
K Khyati		0	1	3
K Surya		1	3	6
K Himalini		0	2	4

## HASSAN

**Table 472:** Plant emergence (%), seed wt.(t/ha), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/9-723	79.33	5.73	11.38	8.80	0.31	14.35
SM/00-42	85.50	4.27	17.70	14.14	0.74	14.11
SM/00-120	85.75	2.98	12.66	9.93	0.72	13.05
VMT 5-1	77.09	3.07	9.85	7.42	0.36	13.58
LBY-17	80.08	2.99	10.11	7.94	0.83	16.02
K Jyoti	79.92	4.18	15.52	11.35	0.62	17.11
K Pukhraj	86.08	4.47	14.03	9.93	2.12	17.64
K Surya	87.50	4.71	12.85	9.48	0.61	15.87
K Himalini	84.50	4.98	16.87	12.81	0.45	19.09
SEd	2.96	0.39	1.44	1.44	0.09	0.60
CD (0.05)	6.13	0.80	2.99	2.98	0.19	1.25
CV (%)	5.04	13.13	15.14	19.89	17.05	5.44

**Table 473:** Plant emergence (%), seed wt.(t/ha), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha), foliage senescence (%) and tuber dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Foliage senescence (%)	Tuber dry matter (%)
MS/9-723	87.92	5.41	13.04	10.09	0.60	10.00	15.12
SM/00-42	88.34	5.03	21.12	18.26	0.92	30.00	15.01
SM/00-120	80.00	3.66	15.25	11.35	0.91	12.50	14.25
VMT 5-1	72.08	3.25	11.12	8.49	0.64	20.00	14.34
LBY-17	75.83	3.61	12.12	9.46	1.11	47.50	17.31
K Jyoti	75.00	4.11	19.46	16.50	0.88	42.50	17.81
K Pukhraj	84.17	4.92	15.31	11.68	1.63	40.00	19.47
K Surya	83.75	4.78	13.83	10.52	0.79	57.50	16.21
K Himalini	80.84	4.38	19.71	16.81	0.78	42.50	20.39
SEd	4.24	0.44	1.08	1.21	0.07	3.88	0.50
CD (0.05)	8.80	0.90	2.23	2.52	0.15	8.05	1.03
CV (%)	7.41	14.15	9.72	13.63	10.88	16.32	4.21

**Table 474:** Plant emergence (%), seed wt.(t/ha), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha), foliage senescence (%) and tuber dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Foliage senescence (%)	Tuber dry matter (%)
MS/9-723	84.00	5.54	15.25	13.26	0.86	30.00	16.61
SM/00-42	89.70	5.09	23.34	20.25	1.15	47.50	16.48
SM/00-120	84.67	4.20	17.48	14.38	1.16	22.50	15.08
VMT 5-1	79.17	3.65	13.57	11.68	1.08	30.00	15.69
LBY-17	82.63	3.35	12.71	9.84	1.34	57.50	18.79
K Jyoti	83.75	3.91	19.87	17.80	1.22	75.00	18.57
K Pukhraj	86.67	5.28	18.58	16.03	1.69	72.50	19.84
K Surya	84.75	4.93	16.94	14.89	1.18	97.50	16.98
K Himalini	82.84	5.14	22.17	19.07	1.04	82.50	20.86
SEd	2.62	0.40	1.20	1.13	0.11	3.92	0.57
CD (0.05)	5.44	0.84	2.49	2.34	0.22	8.15	1.17
CV (%)	4.40	12.49	9.56	10.45	12.84	9.70	4.52

**Table 475:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
MS/9-723	36.12	0	3	18.6	0	4	23.36	0	3
SM/00-42	18.69	0	0	12.2	0	0	15.55	0	0
SM/00-120	29.08	0	0	25.57	0	2	20.72	0	3
VMT 5-1	19.84	0	2.33	15.26	0	3.11	17.52	0	2
LBV-17	32.96	0	2	47.28	0	3	30.67	0	3.11
K Jyoti	18.33	0	0	18.69	0	2	22.34	0	2
K Pukhraj	40.84	0	2	35.37	0	3	28.22	0	4
K Surya	30.16	0	3	22.37	0	3	18.5	0	5.5
K Himalini	18.99	0	2	13.26	0	3	18.6	0	0

**Table 476:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (90 days)		Number basis	Weight basis	
MS/9-723	> 6 week	NIL	100	7	6	10	17
SM/00-42	> 6 week	NIL	100	6	5	9	15
SM/00-120	> 6 week	NIL	100	7	9	7	14
VMT 5-1	> 6 week	NIL	100	6	9	8	14
LBV-17	> 6 week	NIL	100	6	10	6	12
K Jyoti	> 6 week	NIL	100	6	8	5	11
K Pukhraj	> 6 week	NIL	100	7	7	6	13
K Surya	< 6 week	10	100	10	7	7	17
K Himalini	> 6 week	NIL	100	6	7	6	12

**KUFRI****Table 477:** foliage senescence (%), Plant emergence (%), seed wt.(t/ha), total & marketable tuber yield (t/ha), weight of rotten tubers, tuber dry matter (%) and haulm dry matter (%)at 120 days crop

Hybrid/variety	Foliage senescence (%) at		Yield (t/ha)			Number of tubers (000'/ha)			Synchrony (1-5 scale)	AUDPC
	90 days	120 days	Mkt	Un-mkt	Total	Mkt	Un-mkt	Total		
SM/00-42	75.00	85.00	30.48	5.30	35.78	333	171	504	4.25	0.00
SM/00-120	50.00	65.00	16.65	5.52	22.17	225	223	448	3.13	9.88
VMT 5-1	50.00	70.00	17.16	9.36	26.51	244	366	610	3.50	8.33
K Girdhari	45.00	65.00	28.33	2.63	30.96	288	127	415	3.75	0.00
K Himalini	70.00	85.00	20.23	2.04	22.27	227	100	327	3.25	261.45
K Jyoti	80.00	90.00	6.46	3.37	9.83	81	148	228	3.13	726.28
SEd			1.35	0.98	1.48	31.94	36.66	46.29	0.24	7.68
CD (0.05)			2.91	2.10	3.18	68.69	78.85	99.56	0.53	16.52
CV (%)			9.63	29.33	8.51	19.40	27.39	15.52	9.87	6.48

Dates of Late blight readings: 29.07.16 (1<sup>st</sup>), 09.08.16 (2<sup>nd</sup>), 17.08.16 (3<sup>rd</sup>) and 27.08.16 (4<sup>th</sup>)

**Table 478:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage)	% Loss due to rottagage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 120 days)		Number basis	Weight basis	
SM/00-42	> 6 week	Nil	60	5	2	4	9
SM/00-120	> 6 week	Nil	90	8	6	9	17
VMT 5-1	> 6 week	Nil	80	11	4	7	18
K Girdhari	> 6 week	Nil	60	6	5	10	16
K Himalini	> 6 week	Nil	80	10	4	8	18
K Jyoti	< 6 week	Nil	100	14	7	11	25

**OOTY****Table 479:** Plant emergence (%), foliage senescence (%), total & marketable tuber yield (t/ha) and tuber dry matter (%) at 120 days crop

Hybrid/variety	Emergence (%)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber dry matter (%)
SM/00-42	97.08	100.00	21.59	18.33	20.46
SM/00-120	97.92	83.75	12.02	9.53	21.99
VMT 5-1	100.00	93.75	19.48	15.62	23.52
LBY-17	97.92	82.50	16.56	9.31	21.47
K Jyoti	98.75	98.75	6.93	4.22	16.27
K Girdhari	97.09	86.25	25.65	22.38	21.36
K Himalini	98.33	100.00	14.56	11.61	20.60
SE(d)	1.61	6.81	3.69	3.21	0.70
C.D.	NS	NS	7.82	6.80	1.48
C.V.	2.32	10.46	31.30	34.93	4.74

**Table 480:** Disease reaction

Hybrid/ Variety	Incidence of early blight (%)	Intensity of Late blight (%) at 10 days interval after 1 <sup>st</sup> appearance of disease						
		45 days	55 days	65 days	75 days	85 days	95 days	At the time of halumn cutting
SM/00-42	6.00	0.25	0.50	3.25	7.25	17.50	38.75	55.00
SM/00-120	13.50	1.25	8.00	27.50	56.25	73.75	90.00	95.25
VMT 5-1	13.50	-	-	0.50	4.75	18.75	42.50	57.50
LBY-17	0.00	1.25	5.50	42.50	79.00	99.75	100.00	100.00
K Jyoti	0.00	5.00	27.50	75.00	92.50	98.75	100.00	100.00
K Girdhari	5.00	-	-	1.75	5.00	9.50	21.25	25.00
K Himalini	0.00	0.25	4.00	19.25	57.50	93.75	100.00	100.00

**Table 481:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (< or > 6 weeks)	% sprouting		Loss due to sprouting (%)	% Loss due to rottagage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90 days)		Number basis	Weight basis	
SM/00-42	> 6 weeks	0	100.00	0.40	0	0	21.60
SM/00-120	> 6 weeks	0	100.00	0.68	0	0	16.77
VMT 5-1	> 6 weeks	0	94.05	0.22	0	0	18.83
LBY-17	> 6 weeks	0	77.46	0.10	0	0	17.10
K Jyoti	> 6 weeks	23.16	100.00	0.47	0	0	7.27
K Girdhari	> 6 weeks	0	4.79	0.00	0	0	3.93
K Himalini	> 6 weeks	20.33	97.50	0.44	0.001	2.5	4.77

**PUNE**

**Table 482:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha), and tuber dry matter (%) in 75 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottag (t/ha)	Tuber dry matter (%)
MS/9-723	90.00	2.72	67.67	10.35	7.91	2.44	16.03
K Jyoti	93.22	3.76	60.67	12.78	11.65	1.13	16.38
K Laukar	94.33	3.28	64.00	12.41	10.39	2.02	16.07
K Pukhraj	95.11	3.54	64.00	12.96	12.02	0.94	16.95
K Surya	93.11	3.37	63.33	13.16	12.19	0.98	16.20
K Himalini	94.00	2.80	68.00	11.89	10.44	1.45	16.03
SEd	1.56	0.05	1.68	0.72	0.68	0.15	0.24
CD (0.05)	NS	0.12	3.80	1.63	1.53	0.33	0.54
CV (%)	2.05	2.04	3.19	7.21	7.73	12.05	1.80

**Table 483:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottag (t/ha)	Tuber dry matter (%)
MS/9-723	90.67	2.67	82.50	12.15	9.28	2.87	16.28
K Jyoti	92.33	3.83	70.67	13.85	12.48	1.37	16.90
K Laukar	96.00	3.20	74.67	14.02	11.76	2.26	16.30
K Pukhraj	95.67	3.63	70.00	15.33	14.05	1.28	18.18
K Surya	91.33	3.26	75.33	14.39	13.06	1.33	17.05
K Himalini	91.67	2.76	73.67	13.89	12.11	1.78	16.83
SEd	1.11	0.09	1.72	0.63	0.65	0.07	0.12
CD (0.05)	2.51	0.2	3.89	1.41	1.46	0.16	0.28
CV (%)	1.47	3.38	2.83	5.5	6.54	4.87	0.88

**Table 484:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	75 days			90 days		
MS/9-723	Did not appear	17.02	2.13	4.26	23.40	4.26
K Jyoti		12.00	2.00	2.00	22.00	4.00
K Laukar		15.22	0.00	8.70	23.91	2.17
K Pukhraj		24.44	2.22	6.67	28.89	6.67
K Surya		19.15	4.26	4.26	29.79	4.26
K Himalini		22.22	2.22	6.67	22.22	6.67

**Table 485:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottag		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90 days)		Number basis	Weight basis	
MS/9-723	> 6 week	0	0	0	1	45	2.3
K Jyoti	> 6 week	0	0	0	2	78	3.9
K Laukar	> 6 week	0	0	0	3	90	4.5
K Pukhraj	> 6 week	0	0	0	3	95	4.8
K Surya	> 6 week	0	0	0	1	48	2.4
K Himalini	> 6 week	0	0	0	2	68	3.4

## RANICHAURI

**Table 486:** Total tuber yield (t/ha) and late blight incidence (%) at 90 days

Hybrid/variety	Total yield (t/ha)	Date of first appearance of late blight	Disease incidence at 10 days interval (1-9 scale) after the first appearance				
			10.11.16	20.11.16	01.12.16	11.12.16	21.12.16
SM/00-42	16.11	10.11.16	1.0	3.0	7.4	15.0	60.0
SM/00-120	14.55		2.7	9.0	17.7	21.3	86.7
VMT 5-1	13.78		0.0	22.0	40.0	43.3	93.3
LBY-17	9.55		0.0	2.3	45.0	66.7	100.0
K Jyoti	10.67		3.3	22.0	36.7	35.7	91.7
K Himalni	12.33		4.0	19.7	25.7	65.0	88.3
SEd	2.34						
CD (0.05)	NS						
CV (%)	22.29						

## SHILLONG

**Table 487:** Plant emergence (%), seed wt. (t/ha), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber dry matter (%) at 60 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Tuber dry matter (%)
SM/00-42	91.67	3.63	16.34	9.94	0.08	17.68
SM/00-120	94.44	3.57	9.65	4.55	0.00	16.89
VMT 5-1	94.44	3.48	11.97	7.77	0.00	16.46
LBY-17	91.67	3.19	8.34	4.91	0.06	14.12
K Jyoti	100.00	2.53	20.00	14.28	0.00	16.30
K Girdhari	83.33	4.10	8.52	5.55	0.00	17.14
K Himalini	88.89	3.67	5.75	3.66	0.00	17.05
SEd	6.09	0.69	1.97	1.35	0.05	0.97
CD (0.05)	NS	NS	4.33	2.98	NS	NS
CV (%)	8.11	24.56	20.93	22.87	341.40	7.20

**Table 488:** Plant emergence (%), seed wt. (t/ha), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber dry matter (%) at 75 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Tuber dry matter (%)
SM/00-42	88.89	3.63	20.32	14.04	0.00	18.60
SM/00-120	88.89	3.57	9.64	6.00	0.12	17.98
VMT 5-1	86.11	3.48	15.56	12.76	0.00	19.03
LBY-17	86.11	3.19	8.21	6.01	0.00	12.72
K Jyoti	94.45	2.53	16.75	12.38	0.34	17.10
K Girdhari	77.78	4.10	12.37	9.34	0.00	17.73
K Himalini	77.78	3.67	5.92	4.01	0.00	16.43
SEd	10.62	0.69	2.80	2.41	0.20	1.24
CD (0.05)	NS	NS	6.17	5.30	NS	2.74
CV (%)	15.18	24.56	27.06	31.95	367.99	8.91

**Table 489:** Plant emergence (%), seed wt. (t/ha), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber dry matter (%) at 90 days crop

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Tuber rottage (t/ha)	Tuber dry matter (%)
SM/00-42	93.52	3.63	20.90	15.35	0.80	17.92
SM/00-120	67.59	3.57	8.10	5.38	0.32	13.92
VMT 5-1	73.15	3.48	15.32	12.44	1.07	18.78



LBY-17	71.29	3.19	10.96	7.59	0.32	14.37
K Jyoti	79.63	2.53	13.85	11.14	0.68	16.87
K Girdhari	65.74	4.10	7.55	5.33	0.16	17.07
K Himalini	86.11	3.67	19.26	14.78	0.87	16.69
SEd	7.82	0.69	1.41	0.83	0.51	1.24
CD (0.05)	17.23	NS	3.10	1.83	NS	2.74
CV (%)	12.49	24.56	12.57	9.89	103.09	9.22

**Table 490:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
SM/00-42	15	Did not appear	Did not appear
SM/00-120	18		
VMT 5-1	24		
LBY-17	78		
K Jyoti	84		
K Girdhari	5		
K Himalini	32		

**Table 491:** Late blight incidence at 10 days intervals after 1<sup>st</sup> appearance of disease.

Hybrid/ Variety	Date of appearance	Disease incidence at 10 days interval after the first appearance (Days)		
		10 days	20 days	30 days
SM/00-42	30.05.2016	0	0.17	50
SM/00-120	30.05.2016	0	0.5	55
VMT 5-1	09.06.2016	0	0	56.67
LBY-17	20.05.2016	10	100	100
K Jyoti	20.05.2016	73.33	63.33	100
K Girdhari	09.06.2016	0	0	10
K Himalini	20.05.2016	3.33	33.33	50.67

## SRINAGAR

**Table 492:** Plant emergence (%), Seed Wt.(t/ha), Foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers, Tuber dry matter (%) and Haulm dry matter (%)at 120 days crop

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)	Haulm dry matter (%)
SM/00-42	90.78	3.40	84.20	26.55	23.24	0.10	17.45	19.63
SM/00-120	93.50	5.46	81.80	29.85	25.64	0.08	20.25	20.24
VMT 5-1	94.28	4.52	74.60	28.68	25.05	0.09	18.22	20.82
LBY-17	94.92	5.61	87.40	30.75	26.42	0.07	18.05	19.24
K Girdhari	90.42	4.26	79.50	27.23	24.23	0.09	17.72	18.40
K Himalini	91.61	5.42	92.70	30.08	26.09	0.10	19.18	19.67
K Jyoti	92.59	4.47	76.30	28.25	24.68	0.08	17.65	18.85
SEd	0.90	0.22	2.10	0.66	0.64	0.00	0.53	0.96
CD (0.05)	1.91	0.47	4.45	1.40	1.35	0.00	1.12	NS
CV (%)	1.38	6.63	3.61	3.24	3.61	3.41	4.09	6.96

**Table 493:** Late blight incidence at 10 days intervals after 1<sup>st</sup> appearance of disease and tuber wt. loss at 75 days after storage (%).

Hybrid/ Variety	Date of LB appearance	Disease incidence at 10 days interval after the first appearance (Days)						Tuber wt. loss at 75 days after storage (%)
		10	20	30	40	50	60	
SM/00-42	02.06.16	10.1	14.2	24.3	28.7	25.2	21.2	7.63
SM/00-120	27.05.16	10.6	13.8	23.2	29.5	21.4	15.3	5.64
VMT 5-1	23.05.16	11.8	16.3	25.6	32.4	28.2	20.1	7.42
LBY-17	08.06.16	6.8	7.2	11.5	14.3	10.7	7.6	5.82
K Girdhari	05.06.16	9.3	11.2	23.6	28.2	24.3	21.4	6.41
K Himalini	28.05.16	13.2	17.1	26.6	29.9	26.6	23.1	5.45
K Jyoti	25.05.16	11.3	14.4	19.6	30.2	27.2	22.6	7.82

The yield data over 6 locations viz., Hassan, Kufri, Ooty, Ranichauri, Srinagar and Shillong for 3 hybrids viz., SM/00-42, SM/00-120 and VMT 5-1 and three controls viz., K. Himalini, K. Girdhari and K. Jyoti was pooled and stability analysis was done using GGE biplot. Among the hybrids SM/00-42 was best performer for total and marketable tuber yield in all the locations for both the years (Fig1), while SM/00-120 and VMT 5-1 were moderate yielders and the control varieties (Kufri Jyoti and Kufri Himalini) were poor yielders. Among all the locations, Kufri showed wide range of variation while Srinagar had least variation for yield during both the years. SM/00-42 had the highest stability as well as mean yield and is a promising hybrid for the tested locations.

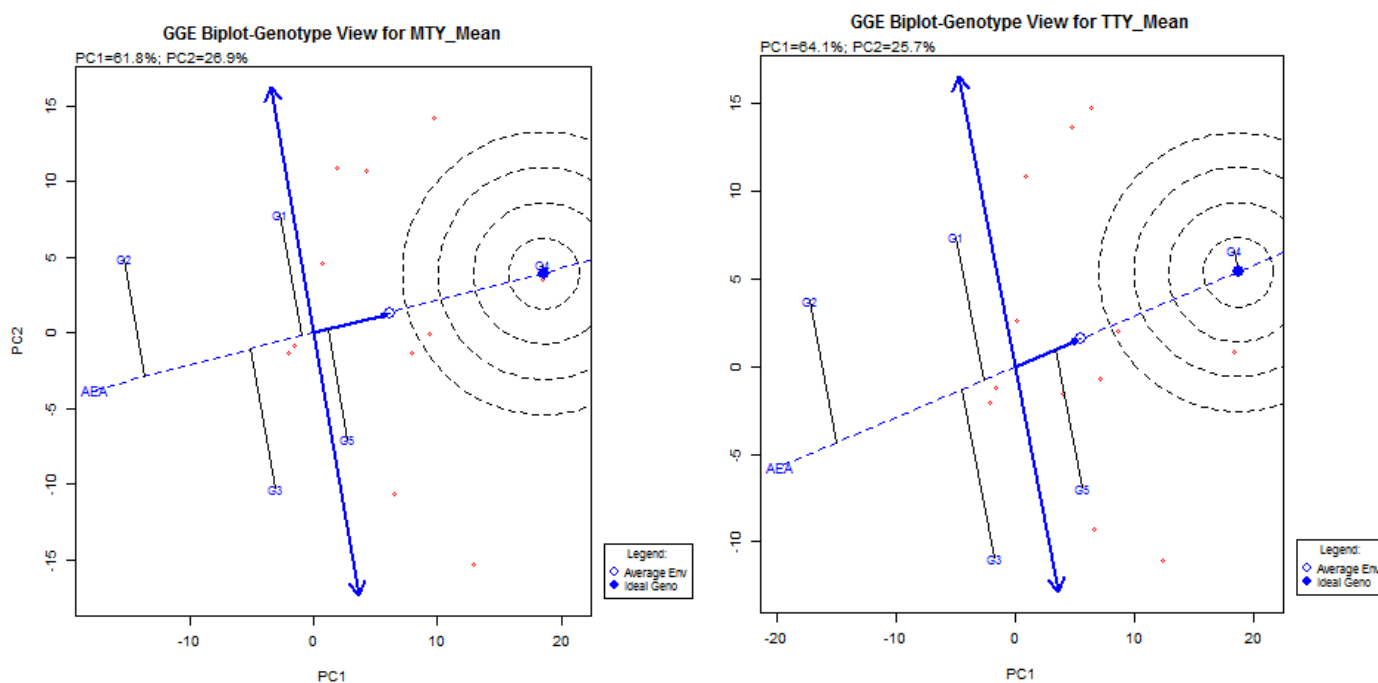


Fig 1: Average environment coordination (AEC) view of the GGE biplot based on environment- focused scaling for the means performance and stability of genotypes.

Genotype codes: G1-K. Himalini; G2- K. Jyoti; G3-SM/00-120; G4- SM/00-42; G5-VMT 5-1

Environment codes: E1-Hassan; E2-Kufri; E3-Ooty; E4-Ooty (Hassan); E5-Ranichauri; E6-Srinagar (2015-16); E7-Hassan; E8- Kufri; E9- Ooty; E10- Ranichauri; E11- Srinagar; E12-Shillong (2016-17)

## GENET. 7 (A): TRIAL WITH PROCESSING HYBRIDS

Four processing hybrids viz., MP/9-901, MP/6-39, MP/4-816, MP/4-578 and controls viz., Atlantic, Kufri Chipsona-1, Kufri Chipsona-3, Kufri Chipsona-4, Kufri Frysona and Kufri Jyoti were evaluated at Dharwad, Hassan, Pune and Srinagar for 75 & 90, 75, 90 & 110, 75 & 90 and 120 days crop durations, respectively. Plant emergence was normal at all locations except for all hybrids and controls at Atlantic (<80.0%) at all crop duration at Hassan except at 110 days crop duration.

Kufri Chipsona-4 was the best control at Dharwad and Srinagar, Kufri Chipsona-3 at Hassan and Pune. None of the hybrid could outyield the best control at any location, although, MP/9-901 at Dharwad and Pune, and MP/4-816 at Hassan were at par to the best check for total and processing grade yield. Late blight incidence was recorded at all locations except at Dharwad. Late blight incidence was very low in Pune, while it was higher in hybrids MP/4-816 and MP/6-39 in comparison to best controls at Hassan. Dry matter content (%) of hybrids and controls was at par at all crop duration at all the testing locations. Storage studies were conducted at Hassan, Pune and Srinagar, and the total weight losses ranged between 14-18% at Hassan, 2.0-5.3% at Pune and 5.72-7.70% at Srinagar. Foliage senescence was recorded at Dharwad, Hassan and Pune. Kufri Chipsona-3 at Dharwad & Pune and Atlantic at Hassan had the maximum senescence.

**Table 494:** Experimental details

Experimental detail/Centre	DWD	HSN	PUN	SRI
Year	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD
Replication	4	4	4	4
Plot size (m <sup>2</sup> )	7.20	9.00	9.00	7.20
Spacing (cm)	60x20	60x20	60x20	60x20
Planting date	23.06.16	07.06.16	01.07.16	29.03.16
Dehauling date	75 DAP	11.09.16	11.08.16	17.09.16
	90 DAP	25.09.16	26.08.16	25.09.16
	110 DAP	-	15.09.16	-
Harvesting date	75 DAP	18.09.16	21.08.16	25.09.16
	90 DAP	03.10.16	05.09.16	10.10.16
	110DAP	-	25.09.16	-
N:P:K dose (kg/ha)	100:75:100	75:75:100	150 :60 :120	160:100:100
Duration of crop (days)	75 & 90	75, 90 & 110	75 & 90	120

## DHARWAD

**Table 495:** Plant emergence (%), foliage senescence (%), total & processing grade yield (t/ha) and weight (t/ha) of rotten tubers in 75 days crop.

Hybrid/variety	Emergence (%)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)
MP/9-901	92.50	11.25	16.46	14.11	0.63
MP/6-39	93.75	11.25	15.03	11.71	1.27
K Chip-1	91.75	12.50	12.71	10.33	0.54
K Chip-3	89.75	55.00	12.35	10.06	0.77
K Chip-4	92.75	11.25	15.45	13.39	0.59
SEd	1.74	2.39	0.72	0.66	0.48
CD (0.05)	NS	5.27	1.58	1.46	NS
CV (%)	2.68	16.72	7.05	7.88	90.26

**Table 496:** Plant emergence (%), foliage senescence (%), total & processing grade yield (t/ha), weight (t/ha) of rotten tubers and late blight (1-9 scale) in 90 days crop.

Hybrid/variety	Emergence (%)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Late blight (1-9 scale)
MP/9-901	92.75	10.00	22.36	20.07	0.83	2
MP/6-39	88.00	11.25	11.08	8.54	0.45	2
K Chip-1	92.00	11.25	13.71	11.03	0.59	0
K Chip-3	89.25	66.25	13.96	11.40	0.74	4
K Chip-4	92.50	23.75	20.41	18.23	0.59	3
SEd	1.21	3.10	1.41	1.36	0.12	
CD (0.05)	2.66	6.82	3.11	2.99	NS	
CV (%)	1.88	17.87	12.26	13.84	26.65	

#### HASSAN

**Table 497:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MP/4-816	67.20	3.89	15.00	12.08	10.40	0.30	18.47
MP/6-39	68.58	5.89	10.00	7.99	5.96	0.22	15.84
K Chip-4	67.75	4.12	25.00	10.29	8.88	0.93	17.04
Atlantic	63.25	2.23	30.00	7.87	6.83	0.63	16.55
K Chip-1	75.00	5.00	27.50	10.24	8.98	0.82	18.34
K Chip-3	71.95	3.94	30.00	12.28	10.88	0.46	18.17
SEd	3.03	0.51	3.93	1.22	1.07	0.07	0.85
CD (0.05)	6.53	1.10	8.45	2.62	2.31	0.14	1.83
CV (%)	6.22	17.35	24.23	17.03	17.53	16.41	6.93

**Table 498:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MP/4-816	70.78	4.04	50.00	12.53	10.53	0.40	19.30
MP/6-39	73.25	5.79	30.00	7.44	6.31	0.23	17.73
K Chip-4	71.31	3.78	70.00	10.45	8.90	1.21	18.77
Atlantic	64.20	2.61	72.50	9.34	7.89	0.76	18.45
K Chip-1	76.42	5.66	52.50	10.60	9.52	1.05	19.13
K Chip-3	74.50	4.72	50.00	12.70	11.20	0.56	19.00
SEd	2.63	0.41	3.80	1.05	0.85	0.06	0.80
CD (0.05)	5.66	0.88	8.18	2.26	1.83	0.13	NS
CV (%)	5.18	13.11	9.92	14.15	13.25	12.34	6.04

**Table 499:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MP/4-816	82.42	4.62	80.00	14.26	11.48	0.44	21.09
MP/6-39	85.67	6.01	70.00	9.75	6.79	0.38	18.33
K Chip-4	83.17	3.63	100.00	12.01	9.45	1.09	19.32
Atlantic	74.17	2.80	100.00	9.03	8.22	0.61	18.73

K Chip-1	91.50	5.29	100.00	13.00	10.10	0.96	20.50
K Chip-3	90.58	5.25	90.00	15.45	12.50	0.84	20.00
SEd	3.55	0.43	4.08	1.43	1.28	0.08	1.00
CD (0.05)	7.64	0.92	8.78	3.09	2.76	0.17	NS
CV (%)	5.94	13.17	6.42	16.56	18.59	15.22	7.22

**Table 500:** Disease reaction

Hybrid/ Variety	Late blight (%)	Late blight intensity	Viral diseases (%)	Late blight (%)	Late blight intensity	Viral diseases (%)	Late blight (%)	Late blight intensity	Viral diseases (%)
	75 days			90 days			110 days		
MP/4-816	26.32	0.00	3.51	20.35	0.00	7.02	15.69	0.00	5.80
MP/6-39	17.95	0.00	8.00	38.60	0.00	8.51	25.79	0.00	10.75
K Chip-4	39.58	0.00	4.17	27.78	0.00	9.26	21.57	0.00	4.90
Atlantic	45.16	0.00	16.13	41.18	0.00	11.76	34.78	0.00	13.04
K Chip-1	30.50	0.00	5.64	22.39	0.00	5.97	16.56	0.00	3.13
K Chip-3	25.43	0.00	1.45	19.23	0.00	1.92	13.56	0.00	3.56

**Table 501:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (90 days)		Number basis	Weight basis	
MP/4-816	> 6 weeks	Nil	100	5	2	9	14
MP/6-39	> 6 weeks	Nil	100	6	4	10	16
K Chip-4	> 6 weeks	Nil	100	6	3	10	16
Atlantic	> 6 weeks	Nil	100	7	4	11	18
K Chip-1	> 6 weeks	Nil	100	5	3	9	14
K Chip-3	> 6 weeks	Nil	100	5	2	9	14

## PUNE

**Table 502:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade yield (t/ha), weight of rotten tubers (t/ha) and dry matter in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MP/4-578	92.33	3.69	66.33	11.70	10.47	1.24	17.05
MP/9-901	95.67	3.65	66.67	12.78	12.28	0.50	17.32
K Chip-4	92.00	3.80	68.00	11.50	10.20	1.24	17.16
Atlantic	91.00	3.31	71.33	11.43	10.35	1.07	17.37
K Chip-3	92.00	3.73	71.83	11.87	10.89	0.92	17.06
K Frysona	95.11	3.63	71.00	10.09	9.65	0.44	17.57
K Jyoti	94.00	2.91	68.33	11.26	9.95	1.31	16.13
SEd	0.97	0.15	2.08	0.41	0.42	0.06	0.72
CD (0.05)	2.14	0.32	NS	0.91	0.91	0.14	NS
CV (%)	1.27	5.06	3.69	4.38	4.82	8.03	5.16

**Table 503:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & processing grade yield (t/ha), weight of rotten tubers (t/ha) and dry matter in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MP/4-578	93.00	3.77	73.33	12.48	11.78	0.70	17.48
MP/9-901	95.33	3.65	75.33	15.93	15.52	0.41	17.38
K Chip-4	92.00	3.81	76.00	12.41	10.30	1.15	17.22
Atlantic	91.00	3.41	74.33	13.28	14.37	1.46	17.72
K Chip-3	92.33	3.63	77.33	14.37	12.67	0.86	16.88
K Frysona	95.00	3.62	73.33	11.58	9.80	0.99	18.57
K Jyoti	91.00	3.09	73.33	13.57	12.28	1.35	17.25
SEd	1.16	0.13	2.73	1.17	0.56	0.10	0.87
CD (0.05)	2.55	0.28	NS	2.58	1.24	0.23	NS
CV (%)	1.53	4.32	4.47	10.73	5.54	12.82	6.08

**Table 504:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	75 days			90 days		
MP/4-578	0.00	8.00	0.00	2.00	22.00	2.00
MP/9-901	0.00	6.38	2.13	2.13	19.15	6.38
K Chip-4	0.00	6.52	0.00	6.52	23.91	2.17
Atlantic	0.00	8.89	0.00	4.44	24.44	0.00
K Chip-3	0.00	4.44	4.44	2.33	30.23	4.65
K Frysona	0.00	6.25	4.17	0.00	29.17	2.08
K Jyoti	0.00	6.38	0.00	4.26	21.28	0.00

**Table 505:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90 days)		Number basis	Weight basis	
MP/4-578	> 6 weeks	0.0	0.0	0.0	1.0	50.0	2.5
MP/9-901	> 6 weeks	0.0	0.0	0.0	1.0	40.0	2.0
K Chip-4	> 6 weeks	0.0	0.0	0.0	2.0	96.0	4.8
Atlantic	> 6 weeks	0.0	0.0	0.0	3.0	105.0	5.3
K Chip-3	> 6 weeks	0.0	0.0	0.0	2.0	85.0	4.3
K Frysona	> 6 weeks	0.0	0.0	0.0	1.0	40.0	2.0
K Jyoti	> 6 weeks	0.0	0.0	0.0	1.0	45.0	2.3

## SRINAGAR

**Table 506:** Plant emergence (%), total & processing grade yield (t/ha) and weight of rotten tubers (t/ha), dry matter (%) and weight loss (%) in 120 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Processing grade tuber yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MP/9-901	90.85	5.28	78.35	29.83	25.58	0.23	19.67
Atlantic	93.75	4.63	85.64	28.10	24.02	0.20	18.05
K Chip-4	94.75	5.42	81.32	33.62	29.15	0.17	20.24
K Chip-3	92.25	5.17	74.25	30.86	26.95	0.19	19.18
K Chip-1	93.25	5.60	69.28	30.52	26.30	0.23	19.35
SEd	0.83	0.17	1.16	0.93	0.47	0.01	0.26

CD (0.05)	1.82	0.38	2.56	2.04	1.02	0.02	0.57
CV (%)	1.26	4.64	2.11	4.28	2.49	4.84	1.89

**Table 507:** Disease reaction and tuber wt. loss at 75 days after storage (%)

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Tuber wt. loss at 75 days after storage (%)
MP/9-901	30.25	Did not appear	Did not appear	7.70
Atlantic	33.58			7.28
K Chip-4	24.89			5.72
K Chip-3	26.18			6.10
K Chip-1	25.26			6.95

## GENET. 7(B): TRIAL WITH PROCESSING HYBRIDS (FRENCH FRIES)

French fry hybrids, MP/4-578 and MP/6-39 were evaluated with controls Kufri Frysona and Kufri Chipsona-1 at Srinagar for 110 days. Plant emergence was normal. Kufri Frysona was the best control for both total and processing grade yields and none of the hybrid could yield better than the best control. The hybrid, MP/4-578 recorded higher late blight incidence in comparison to controls while percentage weight loss was similar in hybrids as well as controls.

**Table 508:** Experimental details

Experimental detail/Centre	SRI
Year	2016-17
Design	RBD
Replication	4
Plot size (m <sup>2</sup> )	7.20
Spacing (cm)	60x20
Planting date	29.03.16
Harvesting date	07.08.16
N:P:K dose (kg/ha)	160:100: 100

### SRINAGAR

**Table 509:** Plant emergence (%), foliage senescence (%), total and French fry grade yield (t/ha), weight of rotten tubers (t/ha), dry matter (%) and weight loss (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage senescence (%)	Total yield (t/ha)	Processing grade yield (t/ha)	Weight of rotten tubers (t/ha)	Dry matter (%)
MP/4-578	91.54	4.34	63.52	29.25	24.06	0.24	18.74
MP/6-39	89.45	4.90	59.45	28.45	23.86	0.22	18.68
K Chip-1	93.25	5.60	69.28	30.52	26.30	0.23	19.35
K Frysona	94.16	5.49	67.84	31.74	27.58	0.25	19.46
SEd	0.54	0.15	1.05	0.53	0.27	0.01	0.11
CD (0.05)	1.24	0.35	2.41	1.21	0.61	0.01	0.26
CV (%)	0.83	4.27	2.28	2.49	1.47	3.51	0.83

**Table 510:** Disease reaction and tuber wt. loss at 75 days after storage (%)

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Tuber wt. loss at 75 days after storage (%)
MP/4-578	33.25	Did not appear	Did not appear	7.62
MP/6-39	25.34			7.14
K Chip-1	25.26			6.95
K Frysona	26.00			6.82



## GENET. 8: ON-FARM TRIAL WITH PROCESSING HYBRIDS

Hybrid, MP/4-578 was evaluated with control varieties viz., Kufri Chipsona-1, Kufri Chipsona-3, Kufri Chipsona-4, Kufri Frysona, Kufri Pukhraj and Atlantic at Dharwad, Hassan and Srinagar at 90, 90 & 110 and 110 days crop durations, respectively. Plant emergence was normal at Dharwad and Srinagar, while at Hassan, hybrid and control varieties observed low emergence (<80%) except for Kufri Chipsona 3 and Kufri Frysona at 110 days crop duration. Kufri Pukhraj at Dharwad, Kufri Chipsona-3 at Hassan and Kufri Chipsona-4 at Srinagar were the best controls for both total and marketable tuber yields. The hybrid could not surpass the best control in any of the location and crop durations. Late blight incidence was at par to the best check at all locations except at Hassan where the hybrid MP/4-578 observed higher late blight incidence during 90 days crop duration. Low incidence of leaf spot and viral diseases was observed at Hassan. The hybrid under testing also had low dry matter content than the best control variety at all the locations. Storage studies were conducted at Hassan and Srinagar and the hybrid MP/4-578 recorded almost similar weight loss in comparison to controls.

**Table 511:** Experimental details

Experimental detail/Centre	DWD	HSN	SRI
Year	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD
Location/Replication	4	4	4
Plot size (m <sup>2</sup> )	96.0	7.20	9.60
Spacing (cm)	60x20	60x20	60x20
Planting date	24.06.16	08.06.16	29.03.16
Dehaulming date 90 days	26.09.16	27.08.16	-
Dehaulming date 110 days		16.09.16	-
Harvesting date 90 days	06.10.16	06.09.16	07.08.16
Harvesting date 110 days		16.09.16	-
N:P:K dose (kg/ha)		75:75:100	160:100: 100
Duration of crop (days)	90	90 & 110	110

### DHARWAD

**Table 512:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and late blight (1-9 scale) in 90 days crop.

Hybrid/variety	Emergence (%)	Foliage Senescence (%)	Total yield (t/ha)	Mkt. tuber yield(t/ha)	Weight of rotten tubers (t/ha)	Late blight (1-9 scale)
MP/4-578	92.00	20.00	14.77	14.50	0.31	1
K Chip-1	91.00	25.00	8.60	7.95	0.54	2
K Chip-3	88.00	52.00	14.78	14.59	1.00	2
K Frysona	92.00	25.00	13.06	12.75	0.50	1
K Pukhraj	95.00	24.00	17.04	16.61	0.30	2

### HASSAN

**Table 513:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Mkt. tuber yield(t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MP/4-578	67.71	6.12	50.00	11.82	10.06	1.57	16.75
K Chip-1	72.35	7.21	62.50	15.90	13.80	1.21	19.79
K Chip-3	71.25	6.20	52.50	19.73	17.03	0.76	18.96
K Frysona	71.93	5.23	80.00	18.56	16.12	0.50	17.15

**Table 514:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Mkt. tuber yield(t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MP/4-578	66.29	5.91	70.00	11.12	8.63	1.79	17.78
K Chip-1	79.23	7.69	100.00	11.55	10.86	1.38	21.40
K Chip-3	80.71	6.65	80.00	16.47	13.07	1.04	20.15
K Frysona	84.80	5.50	100.00	15.55	12.92	0.72	18.56

**Table 515:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	75 days			90 days		
MP/4-578	40.0	0.0	5.0	7.3	0.0	5.0
K Chip-1	35.0	0.0	0.0	7.4	0.0	3.0
K Chip-3	33.0	0.0	0.0	7.1	0.0	5.3
K Frysona	20.0	0.0	0.0	7.7	0.0	3.0

**Table 516:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90 days)		Number basis	Weight basis	
MP/4-578	> 6 weeks	Nil	100	7	10	10	17
K Chip-1	> 6 weeks	Nil	100	5	9	9	14
K Chip-3	> 6 weeks	Nil	100	5	9	8	13
K Frysona	> 6 weeks	Nil	100	6	8	8	14

## SRINAGAR

**Table 517:** Plant emergence (%), seed wt.(t/ha), foliage senescence (%), total & marketable tuber yield (t/ha), weight (t/ha) of rotten tubers and tuber dry matter (%) in 110 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Foliage Senescence (%)	Total yield (t/ha)	Mkt. tuber yield(t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MP/4-816	94.25	4.81	70.95	29.41	24.62	0.18	17.86
Atlantic	93.75	5.48	85.64	28.10	24.02	0.20	18.05
K Chip-4	94.75	4.44	81.32	33.62	29.15	0.17	20.24
K Chip-3	92.25	5.28	74.25	30.86	26.95	0.19	19.18
K Chip-1	93.25	4.12	69.28	30.52	26.30	0.23	19.35
SEd	0.71	0.12	1.15	0.85	0.36	0.02	0.24
CD (0.05)	1.57	0.25	2.52	1.88	0.79	0.04	0.53
CV (%)	1.08	3.38	2.12	3.95	1.93	12.26	1.79

**Table 518:** Disease reaction and tuber wt. loss at 75 days after storage (%)

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Tuber wt. loss at 75 days after storage (%)
MP/4-816	25.82	Did not appear	Did not appear	6.45
Atlantic	33.58			7.28
K Chip-4	24.89			5.72
K Chip-3	26.18			6.10
K Chip-1	25.26			6.95

## GENET. 9A: TRIAL FOR HEAT TOLERANCE

Heat tolerant hybrid, HT/7-1105 was evaluated at Dharwad, Hassan and Pune for 75 & 90, 60, 75 & 90 and 90 days crop duration, respectively, with Kufri Jyoti, Kufri Laukar, Kufri Surya and Kufri Himalini, Kufri Pushkar, Kufri Pukhraj as controls. The plant emergence was normal at all locations except at Hassan for HT/7-1105 (<80%) for 60 and 75 days crop duration. Kufri Himalini was the best control at Dharwad and Hassan, and Kufri Laukar performed better among controls at Pune. The hybrid, HT/7-1105 was at par to the best control at all the three locations. Late blight incidence varied from 5.28 to 30% at Hassan where the hybrid, HT/7-1105 recorded higher incidence (10.61-30%) in comparison to the best control. Leaf spot was observed at Pune (8.89-21.28%) and low incidence of viral diseases was also recorded at both Hassan and Pune. The hybrid, HT/7-1105 recorded less foliage senescence in comparison to the best control at all the locations except at Pune where hybrid recorded 79.25 per cent senescence which was at par to the best control. Tuber dry matter was low in the hybrid in comparison to the best control at Dharwad and Hassan, while at Pune it was at par to the best control. In keeping quality studies, the total weight loss of HT/7-1105 was at par to the best control.

**Table 519:** Experimental details

Centre	DWD	HSN	PUN
Year	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD
Replication (90 days)	4	4	3
Plot size gross ( m <sup>2</sup> )	9.00	18.00	9.00
Spacing (cm)	60x20	60x20	60x20
Planting	22.06.16	09.06.16	10.07.16
Dehauling	60 DAP	-	-
	75 DAP	10.09.16	-
	90 DAP	24.09.16	25.09.16
Harvesting	60 DAP	08.08.16	-
	75 DAP	17.09.16	23.08.16
	90 DAP	03.10.16	07.09.16
N:P:K dose (kg/ha)	100:75:100	75:75:100	150 :60 :120
Duration of crop (days)	60 & 90	60, 75 & 90	90

### DHARWAD

**Table 520:** Plant emergence (%), foliage senescence (%), marketable and total tuber yield (t/ha) in 75 days crop

Hybrid/Variety	Emergence (%)	Foliage Senescence (%)	Mkt. tuber yield(t/ha)	Total tuber yield (t/ha)
HT/7-1105	92.25	5.75	24.00	24.42
K Surya	92.00	22.50	15.32	15.91
K Pushkar	91.50	7.50	18.93	19.29
K Himalini	92.25	5.00	21.32	21.75
K Pukhraj	93.00	18.75	15.24	15.64
SEd	1.91	1.64	1.84	1.74
CD (0.05)	NS	3.62	4.06	3.83
CV (%)	2.93	19.54	13.75	12.68

**Table 521:** Plant emergence (%), foliage senescence (%), marketable & total tuber yield (t/ha), plant vigor (1-5 scale) and late blight (1-9 scale) in 90 days crop

Hybrid/Variety	Emergence (%)	Foliage Senescence (%)	Mkt. tuber yield(t/ha)	Total tuber yield (t/ha)	Plant vigor	Late blight
HT/7-1105	94.75	7.50	26.44	27.43	3.00	2.00
K Surya	93.50	33.75	19.76	20.09	2.00	1.00
K Pushkar	93.25	11.25	19.78	20.68	1.00	1.00
K Himalini	91.50	7.50	26.34	27.36	2.00	1.00
K Pukhraj	92.50	22.50	17.25	17.83	3.00	2.00
SEd	1.06	2.21	3.07	3.04		
CD (0.05)	NS	4.87	6.76	6.69		
CV (%)	1.60	18.97	19.79	18.93		

## HASSAN

**Table 522:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha), tuber dry matter (%) and haulm dry wt (%) in 60 days crop.

Hybrid/ Variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor	Foliage senescence (%)	Total tuber yield (t/ha)	Mkt. tuber yield(t/ha)	Tuber rottage (t/ha)	Tuber dry matter (%)	Haulm dry wt (%)
HT/7-1105	72.91	3.90	4.75	0.00	14.97	12.26	0.91	14.04	47.13
K Surya	80.91	3.64	4.75	9.50	16.38	14.09	0.54	13.06	49.28
K Himalini	84.75	5.22	5.00	0.00	17.36	14.18	0.48	17.03	44.94
SEd	5.28	0.49	0.20	0.41	2.17	2.40	0.18	0.43	3.45
CD (0.05)	NS	1.21	NS	1.02	NS	NS	NS	1.08	NS
CV (%)	9.39	16.14	5.97	18.23	18.86	25.12	39.27	4.14	10.36

**Table 523:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha), tuber dry matter (%) and haulm dry wt (%) in 75 days crop.

Hybrid/ Variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Foliage senescence (%)	Total tuber yield (t/ha)	Mkt. tuber yield(t/ha)	Tuber rottage (t/ha)	Tuber dry matter (%)	Haulm dry wt (%)
HT/7-1105	79.42	4.32	3.25	45.00	17.51	15.27	1.07	15.87	61.73
K Surya	88.13	3.97	3.50	62.50	19.13	17.42	0.73	15.64	65.80
K Himalini	90.40	4.46	3.75	35.00	20.47	18.33	0.63	18.77	63.69
SEd	2.91	0.48	0.43	4.56	1.36	1.53	0.22	0.24	3.26
CD (0.05)	7.25	NS	NS	11.39	NS	NS	NS	0.59	NS
CV (%)	4.78	16.06	17.17	13.59	10.08	12.73	38.52	2.00	7.23

**Table 524:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha), tuber dry matter (%) and haulm dry wt (%) in 90 days crop.

Hybrid/ Variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigor	Foliage senescence (%)	Total tuber yield (t/ha)	Mkt. tuber yield(t/h a)	Tuber rottage (t/ha)	Tuber dry matter (%)	Haulm dry wt (%)
HT/7-1105	84.23	4.86	1.50	77.50	21.35	18.76	1.03	16.19	77.01
K Surya	88.85	4.80	1.25	100.00	21.50	19.51	0.75	16.87	74.80
K Himalini	86.95	4.83	2.00	75.00	22.74	20.27	0.69	19.92	82.44
SEd	3.76	0.70	0.35	3.54	1.21	1.23	0.28	0.55	5.28
CD (0.05)	NS	NS	NS	8.82	NS	NS	NS	1.37	NS
CV (%)	6.13	20.53	31.58	5.94	7.82	8.89	48.92	4.41	9.57

**Table 525:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
HT/7-1105	30.00	0.00	2.00	14.00	0.00	1.00	10.61	0.00	1.00
K Surya	25.00	0.00	0.00	13.07	0.00	1.81	8.07	0.00	1.33
K Himalini	16.99	0.00	1.56	11.83	0.00	1.50	5.28	0.00	0.00

**Table 526:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottagge		Total wt. Losses (%)
		At 6 weeks	End of storage (90 days)		Number basis	Weight basis	
HT/7-1105	> 6 weeks	NIL	100		8	6	14
K Surya	< 6 weeks	20	100	9	7	5	14
K Himalini	> 6 weeks	NIL	100	5	7	5	10

**PUNE****Table 527:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha) and tuber dry matter (%) in 90 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor	Foliage senescence (%)	Total tuber yield (t/ha)	Mkt. tuber yield(t/ha)	Tuber rottagge (t/ha)	Tuber dry matter (%)
HT/7-1105	95.33	3.39	3.50	79.25	17.11	16.85	0.26	20.14
K Jyoti	94.00	3.49	3.00	77.00	15.94	15.36	0.59	18.10
K Surya	95.00	3.53	3.00	73.00	16.47	16.17	0.30	19.55
K Laukar	93.67	3.51	3.00	77.75	17.03	16.33	0.70	18.10
K Himalini	90.33	3.45	2.00	70.50	13.19	12.28	0.92	17.65
SEd	1.48	0.08	0.58	1.33	0.75	0.76	0.05	0.11
CD (0.05)	3.27	NS	NS	2.94	1.64	1.68	0.12	0.23
CV (%)	2.24	3.42	28.16	2.50	6.62	7.00	13.70	0.80

**Table 528:** Disease reaction (90 days)

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
HT/7-1105	2.22	8.89	2.22
K Jyoti	4.44	11.11	2.22
K Surya	2.17	6.52	4.35
K Laukar	6.25	16.67	2.08
K Himalini	8.51	21.28	0.00

**Table 529:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottagge		Total wt. Losses (%)
		At 6 weeks	End of storage (90 days)		Number basis	Weight basis	
HT/7-1105	> 6 weeks	0	0	0	2	78	3.9
K Jyoti	< 6 weeks	0	0	0	3	100	5.0
K Surya	> 6 weeks	0	0	0	1	50	2.5
K Laukar	> 6 weeks	0	0	0	3	105	5.3
K Himalini	> 6 weeks	0	0	0	5	120	6.0

## GENET.9B: ON-FARM TRIAL FOR HEAT TOLERANCE

On farm trial of the hybrid, CP-4054 was conducted at Hassan with Kufri Surya and Kufri Himalini as best controls in 75 and 90 days crop durations. Plant emergence was normal for the hybrid as well as controls. The hybrid, CP-4054 performed better than the best control, Kufri Himalini for both total and marketable tuber yields in 75 as well as 90 days crop durations. The foliage senescence in the hybrid, CP-4054 however was poor in both crop durations in comparison to the best controls. The hybrid, CP-4054 observed very low incidence (3.27%) of late blight in comparison to the best control, Kufri Himalini (10.0%). The dry matter content in CP-4054 was low (12.11-15.58%) in comparison to the best control, Kufri Surya (19.51-19.82%). Storage studies indicated that CP-4054 (11%) had at par weight loss in comparison to best control, Kufri Himalini (12%).

**Table 530:** Experimental details

Experimental detail/Centre	HSN
Year	2016-17
Design	RBD
Replication	4
Plot size (m <sup>2</sup> )	7.20
Spacing (cm)	60x20
Planting date	08.06.16
Dehaulming date 75 days	12.08.16
Dehaulming date 90 DAP	27.08.16
Harvesting date 75 days	22.08.16
Harvesting date 90 days	06.09.16
N:P:K dose (kg/ha)	75:75: 100
Duration of crop (days)	75 & 90

**Table 531:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha), tuber dry matter (%) and haulm dry wt (%) in 75 days crop.

Hybrid/ Variety	Emergence (%)	Seed Wt. (t/ha)	Plant vigour	Foliage senescence (%)	Total tuber yield (t/ha)	Mkt. tuber yield(t/ha)	Tuber rottage (t/ha)	Tuber dry matter (%)	Haulm dry wt (%)
CP-4054	82.90	8.14	5.00	0.00	19.93	18.13	0.39	12.11	65.00
K Surya	84.90	5.38	3.75	50.00	14.80	12.55	1.03	19.82	48.35
K Himalini	82.90	6.26	5.00	37.50	16.18	14.07	0.80	18.70	45.19

**Table 532:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), tuber rottage (t/ha), tuber dry matter (%) and haulm dry wt (%) in 90 days crop.

Hybrid/ Variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigour	Foliage senescence (%)	Total tuber yield (t/ha)	Mkt. tuber yield(t/ha)	Tuber rottage (t/ha)	Tuber dry matter (%)	Haulm dry wt (%)
CP-4054	84.27	8.84	4.50	40.00	22.62	20.86	0.32	15.58	72.35
K Surya	82.15	5.30	1.00	100.00	18.04	15.69	1.10	19.51	55.85
K Himalini	79.42	6.54	1.75	80.00	19.18	16.77	0.68	19.38	60.23

**Table 533:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	75 days			90 days		
CP-4054	3.27	0.00	0.00	0.00	0.00	0.00
K Surya	12.00	0.00	0.00	5.00	0.00	0.00
K Himalini	10.00	0.00	0.00	0.00	0.00	0.00

**Table 534:** Total weight loss after 3 months storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottagge		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90 days)		Number basis	Weight basis	
CP-4054	> 6 weeks	NIL	100	5	7	6	11
K Surya	< 6 weeks	10	100	10	5	6	16
K Himalini	> 6 weeks	NIL	100	6	5	6	12

## GENET.10: ON-FARM EVALUATION OF TPS POPULATIONS

TPS population PT/08-109 along with control 92-PT-27 was evaluated in on farm trials at Hassan for 75 & 90 days crop durations. Seedling survival was normal in both crop durations for both the populations. Seedling vigour and tuber uniformity was better in control, 92-PT-27 population. Total tuber yield and dry matter content was also higher in control, 92-PT-27 than in PT/08-109. Foliage senescence as well as total weight loss after three months of storage was at par in both the populations.

**Table 535:** Experimental details

Experimental detail/Centre	HSN
Year	2016-17
Design	RBD
Location	4
Plot size (m <sup>2</sup> )	16.80
Spacing (cm)	60x20
Date of transplanting	16.06.16
Dehaulming date 75 days	20.08.16
Dehaulming date 90 days	04.09.16
Harvesting date 75 days	30.08.16
Harvesting date 90 days	14.09.16
N:P:K dose (kg/ha)	75:75: 100
Duration of crop (days)	75 & 90

**Table 536:** Seedling survival (%), seedling vigor (1-5 scale), foliage senescence (%), tuber colour (1-5 scale) and tuber shape (1-5 scale) in 75 & 90 days crop.

Treatments	Seedling survival (%)	Seedling Vigor	Foliage senescence (%)	Tuber uniformity (1-5 scale)	
				Shape	Colour
75 days					
PT/08-109	80.50	2.75	71.25	2.75	3.75
92-PT-27	84.63	3.50	70.00	3.50	4.00
90 days					
PT/08-109	83.38	3.00	77.50	3.50	3.25
92-PT-27	82.25	4.00	75.00	3.25	3.75

**Table 537:** Grade-wise & total yield (t/ha), tuber rottage (t/ha) and tuber dry matter (%) in 75 & 90 days crop.

Treatments	Total yield (t/ha)				Tuber Rottage (t/ha)	Tuber dry matter (%)
	0-25g	25-50g	>50g	Total yield		
75 days						
PT/08-109	1.44	1.14	1.51	4.08	0.27	13.38
92-PT-27	2.36	1.46	1.70	5.52	0.24	14.77
90 days						
PT/08-109	1.79	1.49	1.93	5.20	0.30	14.25
92-PT-27	2.48	1.96	1.86	6.30	0.26	15.13

**Table 538:** Total weight loss after 3 months storage at ambient temperature

Hybrid/cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (90 days)		Number basis	Weight basis	
PT/08-109	> 6 weeks	NIL	100	5	4	6	11
92-PT-27	< 6 weeks	NIL	100	4	3	5	9



### GENET. 13: VARIETAL EVALUATION TRIAL TO IDENTIFY TOP THREE PROMISING VARIETIES OF THE REGION (2<sup>ND</sup> YEARS TRIALS)

Varietal evaluation trial was conducted at five locations viz., Dharwad, Hassan, Pune, Shillong and Srinagar to select the top three best suited varieties for kharif region. Twelve varieties at Dharwad, ten at Hassan, eight at Pune, six at Shillong and five at Srinagar were evaluated at different crop durations varying from 60-120 days. Plant emergence was optimum at all testing locations and crop days except at Shillong at 75 days crop durations. Kufri Ashoka at Dharwad, Kufri Garima at Hassan, Kufri Surya at Pune (60 & 90 days), Kufri Khyati at Pune (75 days) and Kufri Jyoti (sprayed) at Srinagar recorded highest total and marketable tuber yields at all crop durations. At Shillong, different varieties performed better for total and marketable tuber yields at different crop durations. Late blight incidence varied from 3.76-40.25% at Hassan and 28.08-35.20% at Srinagar, while infection was very low (<5%) at Pune and Dharwad.

Kufri Surya at Hassan, Kufri Gaurav at Dharwad were the earliest varieties, while most of the varieties were at par in maturity at Pune and Srinagar. Keeping quality studies were done only at Hassan, Pune and Srinagar, and all varieties had at par weight loss after 3 month storage.

**Table 539:** Experimental details

Experimental detail/Centre	DWD	HSN	PUN	SHI	SRI
Year	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD
Replication	4	4	3	4	4
Plot size (m <sup>2</sup> )	9.00	16.80	9.00	9.00	7.20
Spacing (cm)	60 x 20	60 x 20	60 x 20	60 x 20	60 x 20
Planting date	22.06.16	10.06.16	01.07.16	23.02.16	29.03.16
Dehauling date					
60 DAP	-	30.07.16	22.08.16	23.05.16	-
75 DAP	-	14.08.16	07.09.16	08.06.16	-
90 DAP	24.09.16	30.08.16	22.09.16	24.06.16	-
Harvesting date					
60 DAP	-	08.08.16	01.09.16	23.05.16	-
75 DAP		24.08.16	14.09.16	08.06.16	-
90 DAP	01.10.16	09.09.16	05.10.16	24.06.16	07.08.16
Duration of crop (days)	90	60, 75 & 90	60, 75 & 90	60, 75 & 90	120
NPK dose (kg/ha)	100:75:100	75:75:100	150 :60 :120	120 :60 :60	160 :100 :100

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**Table 540:** Plant emergence (%), foliage senescence (%), total & marketable yield (t/ha), weight of rotten tubers (t/ha), plant vigor (1-5 scale) and late blight (1-9 scale) in 90 days crop.

Hybrid/ variety	Emergence (%)	Foliage Senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Plant vigor	Late blight
K Jyoti	86.25	17.00	13.64	14.90	1.26	3.00	2.00
K Bahar	89.25	61.25	19.91	20.74	0.83	4.00	2.00
K Gaurav	86.50	76.25	18.73	19.42	0.68	3.00	1.00
K Himalini	87.50	41.25	17.76	18.09	0.33	2.00	2.00
K Pushkar	90.00	22.00	18.65	18.92	0.27	1.00	2.00
K Badshah	91.00	9.50	16.39	16.52	0.13	3.00	3.00
K Khyati	85.00	16.00	14.25	14.33	0.08	3.00	5.00
K Pukhraj	89.25	14.00	17.08	17.44	0.37	3.00	3.00
K Surya	91.25	8.50	21.05	21.16	0.11	3.00	1.00
K Ashoka	88.75	20.00	23.86	24.71	0.85	2.00	1.00
K Himsona	90.50	5.00	17.63	17.69	0.07	3.00	1.00
K Sindhuri	88.00	10.00	13.28	13.37	0.10	2.00	1.00
SEd	2.14	2.70	2.48	2.52	0.26		
CD (0.05)	NS	5.52	5.07	5.14	0.54		
CV (%)	3.41	15.24	19.82	19.65	88.32		

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**Table 541:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor (1-5 Scale)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
K Jyoti	85.90	3.47	4.75	18.15	16.13	0.27	16.27
K Bahar	83.08	1.66	4.25	10.75	9.03	0.17	15.25
K Gaurav	79.25	1.12	3.75	10.96	8.96	0.90	14.25
K Garima	83.70	3.42	5.00	19.82	18.27	0.41	19.47
K Pushkar	82.56	3.78	5.00	13.48	11.51	0.26	16.70
K Badshah	82.86	1.99	4.75	11.70	10.23	0.18	17.77
K Khyati	77.34	1.11	3.50	9.26	7.71	0.19	11.45
K Pukhraj	86.50	3.78	5.00	17.43	15.36	0.38	18.50
K Surya	86.87	3.28	5.00	16.92	14.76	0.11	12.42
K Ashoka	79.60	1.24	4.25	10.70	9.47	1.16	13.81
SEd	2.44	0.22	0.29	1.69	1.67	0.04	0.70
CD (0.05)	5.02	0.44	0.61	3.49	3.45	0.09	1.44
CV (%)	4.16	12.24	9.20	17.21	19.50	14.82	6.31

**Table 542:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor (1-5 Scale)	Foliage senescence (%)	Total yield (t/ha)	Mkt. yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
K Jyoti	87.19	3.42	4.50	57.50	20.30	18.32	0.31	17.73
K Bahar	84.84	1.85	4.00	52.50	11.51	10.18	0.19	16.95
K Gaurav	81.19	1.34	3.25	43.75	13.96	10.88	1.08	15.57
K Garima	84.87	3.37	4.50	47.00	20.99	19.92	0.42	21.15
K Pushkar	83.08	3.62	4.75	58.50	15.38	13.60	0.33	18.22
K Badshah	81.23	2.18	4.25	46.50	14.32	12.48	0.20	19.18
K Khyati	78.31	0.91	3.00	27.50	10.70	9.05	0.17	13.69
K Pukhraj	85.80	3.52	4.50	55.00	19.25	16.83	0.52	20.02
K Surya	87.96	3.38	4.00	49.25	17.83	15.74	0.12	14.97
K Ashoka	79.24	1.47	3.50	46.25	12.23	10.71	1.51	15.38
SEd	2.83	0.20	0.33	2.40	1.48	1.57	0.04	0.46
CD (0.05)	5.84	0.41	0.68	4.95	3.04	3.24	0.08	0.95
CV (%)	4.81	11.18	11.49	7.02	13.34	16.15	11.65	3.75

**Table 543:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor (1-5 Scale)	Foliage senescence (%)	Total yield (t/ha)	Mkt. yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
K Jyoti	86.28	3.58	2.25	82.50	21.56	20.59	0.39	18.28
K Bahar	85.44	1.53	1.75	85.00	13.60	11.80	0.29	18.14
K Gaurav	84.68	1.39	2.50	80.00	14.55	12.57	1.25	16.21
K Garima	82.46	3.40	2.75	78.75	22.14	21.02	0.56	22.36
K Pushkar	84.19	3.53	2.50	80.00	18.13	15.59	0.36	19.04
K Badshah	83.38	2.13	2.00	83.75	16.67	14.60	0.27	20.70
K Khyati	81.78	1.13	2.75	78.75	12.53	10.22	0.18	14.72
K Pukhraj	85.73	3.48	2.50	80.00	20.59	18.28	0.54	21.24
K Surya	86.58	3.31	1.00	100.00	19.19	16.78	0.15	16.08
K Ashoka	80.11	1.28	1.50	91.25	14.01	12.00	2.00	16.55
SEd	1.88	0.22	0.34	3.76	1.24	1.61	0.06	0.45

CD (0.05)	3.88	0.45	0.69	7.76	2.56	3.31	0.13	0.92
CV (%)	3.16	12.42	22.11	6.34	10.14	14.81	14.85	3.44

**Table 544:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
K Jyoti	10.48	0.00	3.00	8.19	0.00	4.83	5.40	0.00	5.25
K Bahar	20.16	0.00	0.00	15.16	0.00	5.00	13.68	0.00	6.12
K Gaurav	25.18	0.00	3.52	25.00	0.00	4.22	20.42	0.00	5.65
K Garima	9.85	0.00	0.00	5.32	0.00	1.94	3.76	0.00	4.12
K Pushkar	30.00	0.00	0.00	25.69	0.00	2.46	23.54	0.00	5.45
K Badshah	15.00	0.00	0.00	15.26	0.00	5.25	11.17	0.00	8.50
K Khyati	35.16	0.00	4.12	30.18	0.00	4.20	25.21	0.00	7.50
K Pukhraj	15.12	0.00	10.17	14.38	0.00	8.79	11.11	0.00	15.17
K Surya	9.15	0.00	4.05	9.00	0.00	5.42	4.69	0.00	6.25
K Ashoka	40.25	0.00	10.19	35.16	0.00	11.34	31.96	0.00	20.16

**Table 545:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (90 days)		Number basis	Weight basis	
K Jyoti	> 6 weeks	0	100	4	7	6	10
K Bahar	> 6 weeks	0	100	3	4	5	8
K Gaurav	> 6 weeks	0	100	5	8	7	12
K Garima	> 6 weeks	0	100	5	6	6	11
K Pushkar	> 6 weeks	0	100	4	6	5	9
K Badshah	> 6 weeks	0	100	4	7	5	9
K Khyati	> 6 weeks	0	100	5	7	6	11
K Pukhraj	> 6 weeks	0	100	7	7	7	14
K Surya	< 6 weeks	30	100	9	5	5	14
K Ashoka	> 6 weeks	0	100	4	6	5	9

## PUNE

**Table 546:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor (1-5 Scale)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
K Jyoti	90.33	3.85	3.00	11.98	11.71	0.28	18.03
K Bahar	91.33	3.69	3.10	11.17	10.93	0.24	17.13
K Pushkar	93.44	4.00	3.40	12.58	12.40	0.19	17.65
K Khyati	94.11	3.80	3.67	11.91	11.77	0.14	17.77
K Pukhraj	89.33	4.02	3.48	12.35	12.08	0.28	17.33
K Surya	95.33	3.72	4.05	13.02	12.89	0.13	19.18
K Ashoka	90.33	3.96	3.33	12.42	12.04	0.39	17.43
K Laukar	89.70	3.50	3.00	11.50	11.22	0.28	18.12
SEd	0.83	0.07	0.10	0.27	0.29	0.04	0.15
CD (0.05)	1.79	0.15	0.21	0.59	0.63	0.09	0.31
CV (%)	1.11	2.15	3.58	2.75	3.02	21.27	0.99

**Table 547:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor (1-5 Scale)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
K Jyoti	88.33	3.67	3.00	72.33	12.57	12.22	0.35	18.24
K Bahar	90.33	3.67	3.13	74.00	11.76	11.46	0.29	17.40
K Pushkar	91.07	3.93	3.10	73.67	12.46	12.22	0.24	18.62
K Khyati	91.00	3.63	3.70	72.33	13.74	13.54	0.20	17.97
K Pukhraj	89.33	3.93	3.50	76.33	11.68	11.46	0.22	17.43
K Surya	96.00	3.58	4.00	70.33	13.56	13.37	0.18	19.97
K Ashoka	91.67	3.69	3.33	74.00	12.42	12.11	0.31	17.32
K Laukar	90.00	3.56	2.90	78.67	11.95	11.65	0.30	18.22
SEd	0.65	0.07	0.12	1.81	0.70	0.69	0.04	0.11
CD (0.05)	1.40	0.14	0.26	3.92	NS	NS	0.08	0.24
CV (%)	0.87	2.18	4.36	3.00	6.87	6.92	18.13	0.75

**Table 548:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), foliage senescence (%), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor (1-5 Scale)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
K Jyoti	89.00	3.50	3.00	79.33	14.39	14.00	0.39	18.21
K Bahar	89.00	3.52	3.03	80.67	11.93	11.57	0.35	17.53
K Pushkar	91.00	3.76	3.10	80.67	13.61	13.26	0.35	18.71
K Khyati	91.00	3.67	3.97	78.67	13.98	13.63	0.35	18.13
K Pukhraj	90.67	3.82	3.63	80.33	13.63	13.31	0.31	17.35
K Surya	96.33	3.74	4.13	76.33	15.17	14.91	0.26	20.17
K Ashoka	90.33	3.85	3.27	81.33	13.06	12.70	0.35	17.31
K Laukar	89.00	3.50	3.17	84.33	11.52	11.22	0.29	18.26
SEd	0.78	0.06	0.07	1.21	0.50	0.49	0.04	0.35
CD (0.05)	1.68	0.13	0.16	2.62	1.08	1.05	NS	0.76
CV (%)	1.05	1.99	2.57	1.85	4.54	4.56	13.54	2.36

**Table 549:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
K Jyoti	0.00	0.00	0.00	0.00	8.51	2.13	4.26	17.02	4.26
K Bahar	0.00	4.44	0.00	0.00	8.89	0.00	0.00	17.78	2.22
K Pushkar	0.00	2.17	0.00	0.00	6.52	2.17	4.35	15.22	6.52
K Khyati	0.00	8.33	2.08	0.00	6.25	0.00	2.08	12.50	4.17
K Pukhraj	0.00	6.25	0.00	0.00	4.17	4.17	4.17	22.92	4.17
K Surya	0.00	2.04	0.00	0.00	4.08	4.08	0.00	18.37	2.04
K Ashoka	0.00	6.00	0.00	0.00	4.00	0.00	0.00	20.00	0.00
K Laukar	0.00	4.26	0.00	0.00	6.38	0.00	2.13	23.40	0.00

**Table 550:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottag		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90 days)		Number basis	Weight basis	
K Jyoti	> 6 weeks	0	0	0	2	80	4.0
K Bahar	> 6 weeks	0	0	0	4	120	6.0
K Pushkar	> 6 weeks	0	0	0	2	75	3.8
K Khyati	> 6 weeks	0	0	0	1	40	2.0
K Pukhraj	> 6 weeks	0	0	0	5	148	7.4
K Surya	> 6 weeks	0	0	0	1	48	2.4
K Ashoka	> 6 weeks	0	0	0	2	78	3.9
K Laukar	> 6 weeks	0	0	0	3	93	4.7

**SHILLONG****Table 551:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor (1-5 Scale)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
K Girdhari	78.33	3.18	4.00	9.43	6.97	0.04	16.03
K Himalini	80.00	4.19	4.25	17.39	14.54	0.04	18.46
K Shailja	88.33	2.54	4.00	17.37	14.12	0.14	16.57
K Kanchan	87.50	2.29	3.50	9.91	7.78	0.00	18.54
K Megha	90.00	3.30	3.75	14.04	9.69	0.09	16.76
K Jyoti (Sprayed)	87.50	3.68	4.50	16.54	13.62	0.42	15.80
K Jyoti (Unsprayed)	87.68	3.60	4.50	17.45	14.49	0.08	15.68
SEd	6.09	0.07	0.54	2.10	1.86	0.14	1.25
CD (0.05)	NS	0.15	NS	4.44	3.93	NS	NS
CV (%)	10.07	3.00	18.63	20.33	22.64	177.20	10.47

**Table 552:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor (1-5 Scale)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
K Girdhari	75.00	3.18	4.00	17.62	14.55	1.62	14.07
K Himalini	73.61	4.19	4.25	16.68	14.25	1.18	13.23
K Shailja	70.14	2.54	4.00	10.97	8.98	0.23	15.62
K Kanchan	73.61	2.29	3.50	14.98	12.38	1.24	15.20
K Megha	72.22	3.30	3.75	17.50	15.13	2.23	14.06
K Jyoti (Sprayed)	71.53	3.68	4.50	15.88	13.83	1.69	12.76
K Jyoti (Unsprayed)	67.36	3.60	4.50	17.33	15.31	1.42	16.19
SEd	3.34	0.07	0.54	2.20	2.55	0.53	1.31
CD (0.05)	NS	0.15	NS	NS	NS	1.12	NS
CV (%)	6.57	3.00	18.63	19.67	26.76	54.37	12.80

**Table 553:** Plant emergence (%), seed wt.(t/ha), plant vigor (1-5 scale), total & marketable tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Plant vigor (1-5 Scale)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
K Girdhari	85.83	3.18	4.00	17.35	14.69	1.44	15.89
K Himalini	79.17	4.19	4.25	15.84	12.49	0.59	15.63
K Shailja	81.67	2.54	4.00	14.24	10.87	0.67	14.56
K Kanchan	82.50	2.29	3.50	9.73	7.69	0.12	16.65
K Megha	85.83	3.30	3.75	14.75	11.48	0.69	15.34
K Jyoti (Sprayed)	81.67	3.68	4.50	17.74	15.12	0.25	12.85
K Jyoti (Unsprayed)	82.50	3.60	4.50	16.45	13.98	0.27	13.38
SEd	4.74	0.07	0.54	2.33	2.28	0.60	1.66
CD (0.05)	NS	0.15	NS	4.93	NS	NS	NS
CV (%)	8.10	3.00	18.63	21.72	26.12	148.15	15.71

**Table 554:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
K Girdhari	10	Did not appear	Did not appear	10	Did not appear	Did not appear	10	Did not appear	Did not appear
K Himalini	40			40					
K Shailja	100			100					
K Kanchan	100			100					
K Megha	100			100					
K Jyoti (Sprayed)	100			100					
K Jyoti (Unsprayed)	100			100					

## SRINAGAR

**Table 555:** Plant emergence (%), seed wt.(t/ha), , foliage senescence (%), plant height (cm), no. of shoots/plant, total & marketable tuber yield (t/ha), tuber rottage (t/ha) and dry matter (%) in 120 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage Senescence (%)	Plant height (cm)	No. of shoots/plant	Total yield (t/ha)	Mkt yield (t/ha)	Tuber rottage (t/ha)	Dry matter (%)
K Girdhari	92.76	5.47	65.29	34.72	3.62	31.65	27.16	19.01	0.25
K Himalini	94.15	5.40	64.27	30.85	3.52	32.34	28.08	19.34	0.24
K Shailja	92.05	4.89	65.51	29.28	3.15	29.25	24.62	18.00	0.25
K Kanchan	90.12	4.51	71.76	33.18	4.06	28.10	23.70	16.90	0.21
K Jyoti (Sprayed)	95.74	4.90	69.26	38.26	4.84	34.40	29.45	19.62	0.22
K Jyoti (Unsprayed)	90.12	5.00	62.31	35.15	4.92	27.00	22.56	16.92	0.23
SEd	0.97	0.18	0.77	0.91	0.15	0.46	0.50	0.14	0.01
CD (0.05)	2.09	0.38	1.67	1.97	0.33	0.99	1.07	0.31	0.02
CV (%)	1.49	4.91	1.65	3.85	5.32	2.14	2.70	1.12	4.85

**Table 556:** Disease reaction and total weight loss after 3 months storage at ambient temperature

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Total wt. Losses (%)
K Girdhari	29.25	-	-	6.65
K Himalini	32.25	-	-	7.10
K Shailja	30.86	-	-	6.42
K Kanchan	31.50	-	-	7.59
K Jyoti (Sprayed)	28.08	-	-	6.36
K Jyoti (Unsprayed)	35.20	-	-	8.03

## GENET.14: VARIETAL EVALUATION FOR PRODUCTION OF BABY/SALAD POTATOES (SPECIALTY POTATO)

In variety evaluation for suitability of baby/salad potatoes production, one hybrid and two varieties at Hassan at 60, 75 and 90 days crop duration and 7 varieties at Pune at 75 and 90 days crop duration were evaluated. The plant emergence was optimum at both the testing centres (>80 %) except for Kufri Shailja (77.69%) at Hassan at 60 days crop duration. At Hassan, the hybrid MP/16-b was the highest total tuber yielder variety whereas Kufri Surya performed best at Pune. MP/16-b also produced highest percentage of baby tubers (<50g weight) at Hassan in all the crop durations. Kufri Khyati at 75 days crop duration and Kufri Himsona at 90 days crop duration at Pune were the highest baby tuber (<50g weight) producing varieties. Late blight infection was low in all the varieties as well hybrid in both the locations. Total weight loss in hybrid as well as all the varieties was 10-14% at Hassan and 2.5 to 7.25% at Pune.

**Table 557:** Experimental details

Experimental detail/Centre	HSN	PUN
Year	2016-17	2016-17
Design	RBD	RBD
Replication	4	3
Plot size (gross) m <sup>2</sup>	7.20	9.00
Spacing (cm)	60x20	60x20
Planting date	14.06.16	01.07.16
Dehaulming date	60 DAP 03.08.16	-
	75 DAP 18.08.16	17.09.16
	90 DAP 02.09.16	25.09.16
Harvesting date	60 DAP 13.08.16	-
	75 DAP 28.08.16	25.09.16
	90 DAP 12.09.16	10.10.16
Duration of crop (days)	60, 75 & 90	75 & 90
NPK dose (kg/ha)	100:75:100	150:60:120

### HASSAN

**Table 558:** Plant emergence (%), seed wt. (t/ha), grade-wise baby tuber (%), grade-wise yield of baby tuber (t/ha), tuber dry matter (%) and weight of rotten tubers (t/ha) in 60 days crop.

Hybrid/ variety	Emergence (%)	Seed Wt. (t/ha)	Baby tuber (%)			Yield of baby tuber (t/ha)				Tuber dry matter (%)	Weight of rotten tubers (t/ha)
			10- 25g	25- 50g	>50g	10- 25g	25- 50g	>50g	Total		
MP/16-b*	92.03	2.33	47.50	35.00	17.50	6.18	5.43	4.32	15.93	16.11	0.44
K Himsona	85.14	3.18	55.00	30.00	15.00	7.97	2.56	1.56	12.09	19.27	1.04
K Shalija	77.69	3.85	60.00	27.50	12.50	8.80	2.95	1.40	13.14	15.28	0.23
SEd	2.06	0.40	4.86	6.35	2.64	0.89	0.58	0.18	1.18	0.55	0.16
CD (0.05)	5.14	0.99	NS	NS	NS	NS	1.45	0.46	2.95	1.36	0.39
CV (%)	3.43	17.94	12.69	29.11	24.85	16.52	22.57	10.75	12.19	4.57	38.50

\* Primary evaluation

**Table 559:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), grade-wise baby tuber (%), grade-wise yield of baby tuber (t/ha), tuber dry matter (%) and weight of rotten tubers (t/ha) in 75 days crop.

Hybrid/ variety	Emer- gence (%)	Seed Wt. (t/ha)	Foliage sene- scence (%)	Baby tuber (%)			Yield of baby tuber (t/ha)				Tuber dry matter (%)	Tuber rottag (t/ha)
				10- 25g	25- 50g	>50g	10- 25g	25- 50g	>50g	Total		
MP/16-b*	90.64	2.40	50.00	30.00	45.00	25.00	5.85	7.10	5.89	18.84	18.19	1.16
K Himsona	86.02	3.79	0.00	12.50	30.00	57.50	2.06	3.56	8.53	14.14	21.96	1.40
K Shalija	80.31	4.12	30.00	11.25	16.25	72.50	2.21	4.10	10.82	17.13	16.96	0.94

SEd	3.27	0.36	3.33	3.77	4.68	3.54	0.83	0.55	0.51	1.25	0.79	0.16
CD (0.05)	NS	0.90	8.32	9.41	11.67	8.82	2.08	1.37	1.28	3.11	1.98	NS
CV (%)	5.40	14.87	17.68	29.78	21.75	9.68	35.01	15.74	8.64	10.54	5.90	19.12

\* Primary evaluation

**Table 560:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), grade-wise baby tuber (%), grade-wise yield of baby tuber (t/ha), tuber dry matter (%) and weight of rotten tubers (t/ha) in 90 days crop.

Hybrid/ variety	Emer- gence (%)	Seed Wt. (t/ha)	Foliage sene- scence (%)	Baby tuber (%)			Yield of baby tuber (t/ha)				Tuber dry matter (%)	Tuber rottag (t/ha)
				10- 25g	25- 50g	>50g	10- 25g	25- 50g	>50g	Total		
MP/16-b*	91.54	2.71	77.50	22.50	43.75	33.75	6.97	9.65	7.70	24.32	19.67	1.75
K Himsona	84.69	3.62	22.50	10.00	18.75	71.25	3.46	5.35	9.92	18.73	23.53	1.89
K Shalija	78.11	4.24	60.00	11.25	15.00	73.75	3.38	4.60	11.94	19.92	18.53	1.33
SEd	2.85	0.41	4.86	1.32	2.83	2.64	0.26	0.75	0.67	1.10	1.03	0.09
CD (0.05)	7.10	1.01	12.12	3.29	7.05	6.57	0.65	1.88	1.66	2.74	2.56	0.23
CV (%)	4.75	16.33	12.89	12.78	15.47	6.26	7.95	16.27	9.56	7.40	7.05	7.84

\* Primary evaluation

**Table 561:** Disease reaction

Hybrid/ Variety	Late blight (%)	Early blight (%)	Viral diseases (%)	Late blight (%)	Early blight (%)	Viral diseases (%)	Late blight (%)	Early blight (%)	Viral diseases (%)
	60 days			75 days			90 days		
	MP/16-b*	9.04	0	0	8.15	0	0	6.52	0
K Himsona	14.49	0	3.38	10.56	0	3.28	5.65	0	5.66
K Shalija	6.56	0	3.28	5.34	0	3.35	3.15	0	4.12

\* Primary evaluation

**Table 562:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottag		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90 days)		Number basis	Weight basis	
MP/16-b*	> 6 weeks	NIL	100	5	6	5	10
K Himsona	> 6 weeks	NIL	100	6	7	8	14
K Shalija	> 6 weeks	NIL	100	5	6	6	11

\* Primary evaluation

## PUNE

**Table 563:** Plant emergence (%), seed wt.(t/ha), grade-wise baby tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Grade-wise tuber yield (t/ha)			Total yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
			10-25 g	25-50 g	>50 g			
K Himsona	89.33	3.46	3.09	2.46	5.63	11.18	0.31	17.20
K Khyati	95.00	3.72	2.59	3.29	7.87	13.76	0.29	17.80
K Pukhraj	94.11	3.80	1.78	3.38	9.02	14.18	0.22	17.42
K Surya	96.22	3.67	1.24	3.83	10.13	15.20	0.20	19.15
K Ashoka	93.78	3.91	1.59	3.54	7.83	12.96	0.26	17.08
K Laukar	90.67	3.37	1.09	3.29	8.20	12.59	0.22	18.00
K Jyoti	90.44	3.85	1.87	3.22	9.35	14.44	0.28	16.74
SEd	1.98	0.07	0.16	0.12	0.43	0.39	0.08	0.23



CD (0.05)	4.36	0.15	0.35	0.26	0.95	0.86	NS	0.51
CV (%)	2.61	2.30	10.16	4.43	6.34	3.55	37.30	1.60

**Table 564:** Plant emergence (%), seed wt.(t/ha), grade-wise baby tuber (%), total tuber yield (t/ha), weight of rotten tubers (t/ha) and tuber dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt.(t/ha)	Grade-wise tuber yield (t/ha)			Total yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
			10-25 g	25-50 g	>50 g			
K Himsona	85.67	3.48	1.80	6.41	7.89	16.09	0.43	18.15
K Khyati	94.33	3.70	1.69	6.61	9.46	17.76	0.38	18.33
K Pukhraj	93.67	3.76	1.46	4.52	9.54	15.52	0.33	18.18
K Surya	95.67	3.67	0.72	6.48	11.43	18.63	0.25	19.96
K Ashoka	94.00	3.91	1.15	5.26	9.24	15.65	0.39	17.48
K Laukar	90.67	3.37	0.76	5.30	9.04	15.09	0.29	18.40
K Jyoti	93.33	3.83	1.18	4.63	10.33	16.15	0.43	17.30
SEd	0.97	0.07	0.06	0.64	0.55	0.87	0.08	0.16
CD (0.05)	2.13	0.15	0.13	1.40	1.21	1.91	NS	0.36
CV (%)	1.28	2.21	5.81	13.90	7.05	6.48	25.76	1.09

**Table 565:** Disease reaction

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	75 days			90 days		
K Himsona	0.00	6.38	2.13	2.13	14.89	4.26
K Khyati	0.00	6.67	2.22	4.44	15.56	2.22
K Pukhraj	0.00	4.44	2.22	6.67	20.00	0.00
K Surya	0.00	4.17	0.00	2.08	10.42	0.00
K Ashoka	0.00	6.52	2.17	4.35	17.39	2.17
K Laukar	0.00	10.87	4.35	2.17	19.57	4.35
K Jyoti	0.00	6.67	0.00	2.22	20.00	0.00

**Table 566:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage ( 90 days)		Number basis	Weight basis	
K Himsona	> 6 weeks	0	0	0	6	110	5.5
K Khyati	> 6 weeks	0	0	0	1	50	2.5
K Pukhraj	> 6 weeks	0	0	0	5	145	7.25
K Surya	> 6 weeks	0	0	0	1	52	2.6
K Ashoka	> 6 weeks	0	0	0	3	82	4.1
K Laukar	> 6 weeks	0	0	0	4	116	5.8
K Jyoti	> 6 weeks	0	0	0	2	84	4.2

## GENET.15: STANDARDIZATION OF TPS TECHNOLOGY

For standardization of TPS technology two hybrids viz., D-150 and 92-PT-27 were evaluated at Hassan centre. The seedling survival, seedling vigour, tuber colour and tuber shape were optimum and at par in both the treatments. Non-significant differences were observed among two hybrids for total as well as marketable tuber yields in both the methods. Late blight incidence was less than 10 per cent in both the hybrids in both approaches.

**Table 567:** Experimental details

Location	:	HSN	Year	:	2016-17
Design	:	RBD	Plot size(m <sup>2</sup> )	:	7.20
Treatment	:	4	Spacing (cm)	:	50 X 10
Date of planting	:	16.06.16	Date of haulm cutting (90DAP)	:	04.09.16
N:P:K dose (kg/ha)	:	75:75:100	Date of harvesting (90DAP)	:	14.09.16

**Table 568:** Plant emergence (%), plant vigor (1-5 scale), foliage senescence (%), tuber dry matter (%) and organoleptic test (1-5 scale) in brick bed method and normal nursery method

Treatments	Emergence (%)	Plant vigor	Foliage Senescence (%)	Tuber dry matter (%)	Organoleptic test					
						Emergence (%)	Plant vigor	Foliage Senescence (%)	Tuber dry matter (%)	Organoleptic test
Brick Bed method						Normal Nursery method				
92-PT-27	80.00	3.75	76.25	12.63	3.50	78.00	2.75	75.75	11.39	3.00
D-150	88.00	4.75	80.75	14.06	4.00	82.00	3.50	82.25	13.55	3.75
SEd	3.24	0.41	4.86	0.41	0.65	4.34	0.48	4.17	0.35	0.63
CD (0.05)	NS	NS	NS	1.36	NS	NS	NS	NS	1.16	NS
CV (%)	5.46	13.59	8.75	4.38	24.34	7.67	21.66	7.47	3.99	26.36

**Table 569:** Total yield (t/ha), marketable yield (t/ha), weight of rotten tubers (t/ha) and tuber uniformity (1-5 scale) in brick bed method and normal nursery method

Treatments	Total yield (t/ha)	Mkt yield (t/ha)	Tuber rottage (t/ha)	Tuber uniformity (1-5 scale)		Total yield (t/ha)	Mkt yield (t/ha)	Tuber rottage (t/ha)	Tuber uniformity (1-5 scale)	
				Shape	Color				Shape	Color
				Brick Bed method					Normal Nursery method	
92-PT-27	10.24	7.74	0.56	3.00	3.50	10.17	7.10	0.71	2.50	3.25
D-150	11.27	8.93	0.28	4.00	4.25	10.49	8.18	0.49	3.25	3.50
SEd	0.82	0.70	0.12	0.41	0.25	0.35	1.42	0.13	0.25	0.25
CD (0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CV (%)	10.82	11.84	41.21	16.50	9.12	4.74	26.25	29.70	12.30	10.48

**Table 570:** Disease reaction

Hybrid/Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
	Brick Bed method			Normal Nursery method		
92-PT-27	8.55	0	2.16	9.17	0	2.69
D-150	6.15	0	2.05	5.55	0	2.25

**Table 571:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottage		Total wt. Losses (%)
		At 6 weeks	End of storage (90 days)		Number basis	Weight basis	
92-PT-27	> 6 weeks	NIL	100	6	4	8	14
D-150	> 6 weeks	NIL	100	5	4	5	10

## GENET.16: TRAIL WITH SPECIALTY POTATO HYBRIDS

Single hybrid MS/08-1565 was evaluated alongwith controls Kufri Lalima, Kufri Sindhuri, Kufri Lalit, Kufri Khyati at 2 centres viz., Hassan for 60, 75 and 90 days crop duration and at Srinagar for 120 days crop duration during *Kharif* season.

The plant emergence was less than 80% in some varieties at Hassan, while it was normal at Srinagar. None of the genotypes at Hassan and Srinagar reached more than equal to 80% senescence at 90 and 120 days crop, respectively. Kufri Lalima was the best total and marketable tuber yielding control both at Hassan and Srinagar at all crop durations, and hybrid, MS/08-1565 could not yield better than it. Late blight occurrence was >20% at both the locations except at 90 days crop duration at Hassan. Viral diseases were observed at Hassan (1.85-19.67%). The percent weight loss was at par in hybrid, MS/08-1565 to best control Kufri Khyati at Hassan. At Hassan dry matter content was at par among hybrid and controls.

**Table 572:** Experimental details

Experimental detail/Centre	HSN	SRI
Year	2016-17	2016-17
Design	RBD	RBD
Replication	4	4
Plot size (gross) m <sup>2</sup>	9.00	7.20
Spacing (cm)	60 x 20	60 x 20
Planting date	14.06.16	29.03.16
Dehauling date	60 DAP	-
	75 DAP	-
	90 DAP	-
Harvesting date	60 DAP	-
	75 dap	-
	90 DAP	07.08.16
Duration of crop (days)	60, 75 & 90	120
NPK dose (kg/ha)	75:75:100	160 :100 :100

### HASSAN

**Table 573:** Plant emergence (%), seed wt. (t/ha), total & marketable tuber yield (t/ha) and weight of rotten tubers (t/ha) and tuber dry matter (%) in 60 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/08-1565	81.94	3.79	12.38	9.50	0.46	16.30
K Lalit	73.33	3.03	11.98	9.08	0.43	14.97
K Khyati	69.22	3.49	11.46	8.61	0.26	16.30
K Lalima	85.28	3.37	14.22	10.95	0.19	17.68
K Sindhuri	63.61	3.48	9.53	6.83	0.38	16.35
SEd	3.40	0.38	1.26	1.03	0.04	0.73
CD (0.05)	7.49	NS	2.77	2.26	0.09	1.60
CV (%)	6.44	15.84	14.94	16.13	17.33	6.28

**Table 574:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and weight of rotten tubers (t/ha) and tuber dry matter (%) in 75 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/08-1565	79.48	3.64	12.50	16.53	14.20	0.96	18.17
K Lalit	71.21	3.13	20.00	15.60	13.08	0.73	16.96

K Khyati	67.16	4.32	15.00	14.51	12.09	0.40	19.62
K Lalima	83.59	3.65	20.00	17.76	15.03	0.29	20.03
K Sindhuri	62.20	4.02	5.00	13.39	10.61	0.41	19.52
SEd	4.32	0.43	4.18	1.26	1.18	0.07	0.88
CD (0.05)	9.52	NS	9.22	2.76	2.59	0.16	1.94
CV (%)	8.40	16.33	40.80	11.41	12.80	18.59	6.61

**Table 575:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and weight of rotten tubers (t/ha) and tuber dry matter (%) in 90 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)	Tuber dry matter (%)
MS/08-1565	82.47	3.96	60.00	19.70	17.22	1.76	20.90
K Lalit	65.15	3.90	65.00	18.94	16.42	0.99	19.80
K Khyati	61.26	3.84	55.00	16.48	14.39	0.48	21.27
K Lalima	81.12	3.89	62.50	20.60	18.11	0.36	22.49
K Sindhuri	62.09	3.65	40.00	13.94	12.55	0.48	22.26
SEd	4.10	0.45	4.56	1.34	1.27	0.11	0.81
CD (0.05)	9.04	NS	10.06	2.95	2.80	0.24	1.78
CV (%)	8.24	16.50	11.43	10.57	11.42	19.14	5.37

**Table 576:** Dry matter content (%), organoleptic test (1-5 scale) and disease reaction

Hybrid/ Variety	Late blight intensity	Leaf spot diseases (%)	Viral diseases (%)	Late blight intensity	Leaf spot diseases (%)	Viral diseases (%)	Late blight intensity	Leaf spot diseases (%)	Viral diseases (%)
	60 days			75 days			90 days		
MS/08-1565	30.82	0	6.94	36.20	0	4.54	30.00	0	3.17
K Lalit	42.86	0	13.79	27.87	0	5.55	24.07	0	3.28
K Khyati	28.57	0	10.91	18.19	0	9.09	15.09	0	6.12
K Lalima	25.37	0	10.14	20.29	0	2.98	14.28	0	1.85
K Sindhuri	24.07	0	19.67	19.67	0	5.91	17.30	0	1.64

**Table 577:** Total weight loss after 3 months Storage at ambient temperature

Hybrid/ cultivar	Dormancy (less than or more than 6 weeks)	% sprouting		% Wt Loss due to sprouting (At the end of storage 90 days)	% Loss due to rottag		Total wt. Losses (%)
		At 6 weeks	End of storage (90 days)		Number basis	Weight basis	
MS/08-1565	> 6 weeks	Nil	100	6	6	8	14
K Lalit	> 6 weeks	Nil	100	6	6	7	13
K Khyati	> 6 weeks	Nil	100	5	6	7	12
K Lalima	> 6 weeks	Nil	100	5	5	8	13
K Sindhuri	> 6 weeks	Nil	100	5	9	10	15

## SRINAGAR

**Table 578:** Plant emergence (%), seed wt. (t/ha), foliage senescence (%), total & marketable tuber yield (t/ha) and weight of rotten tubers (t/ha) in 120 days crop.

Hybrid/variety	Emergence (%)	Seed Wt. (t/ha)	Foliage senescence (%)	Total yield (t/ha)	Marketable yield (t/ha)	Weight of rotten tubers (t/ha)
MS/08-1565	93.75	5.35	68.25	32.08	27.86	0.20
K Lalima	94.50	4.53	57.45	33.46	29.04	0.18
K Sindhuri	89.31	4.42	62.18	26.87	20.58	0.19
K Lalit	90.78	4.77	72.40	29.00	24.62	0.19
SEd	0.94	0.13	1.07	0.47	0.39	0.01
CD (0.05)	2.16	0.29	2.45	1.07	0.90	0.01
CV (%)	1.45	3.71	2.32	2.18	2.18	4.33

**Table 579:** Disease reaction & Disease incidence at 10 days interval after the first appearance (Days)

Hybrid/ Variety	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)	Date of LB appearance	Disease incidence at 10 days interval after the first appearance (Days)					
					10	20	30	40	50	60
MS/08-1565	27.46	-	-	01.06.16	6	9	8	7	5	5
K Lalima	21.24	-	-	05.06.16	5	8	6	6	5	4
K Sindhuri	26.04	-	-	25.08.16	7	9	9	8	6	5
K Lalit	22.85	-	-	24.05.16	6	8	9	6	5	4

## CROP PRODUCTION

### AGRON. 1: INTERCROPPING STUDIES IN POTATO

The experiment was conducted at Raipur centre.

**Table 580:** Experimental details

Center	Year	Design	Rep	Plot size Gross (m <sup>2</sup> )	Plot size Net (m <sup>2</sup> )
RPR	2016-17	RBD	3	12.96	7.68

Table contd.....

Treatment	Variety	Spacing (cm)	Seed sown/ plot	Fertilizer (kg/ha)			Date of	
				N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Planting	Harvesting
Potato	K. Pukhraj	60X20	20 Kg	150	100	100	15.11.16	20.02.17
Maize	Sugar 75	60X20	20 gm	100	60	40	15.11.17	18.02.17
Cabbage	Golden Acre	60X60	5 gm	180	80	80	15.11.18	18.02.17

#### Treatments

T1	:	Sole Potato
T2	:	Sole Cluster bean
T3	:	Sole Cabbage
T4	:	Potato+ Cluster bean (1:1 ratio)
T5	:	Potato+ Cabbage (1:1 ratio)
T6	:	Potato+ Cluster bean (2:1 ratio)
T7	:	Potato+ Cabbage (2:1 ratio)

A decreased in the yield of potato tuber was observed under intercropping, however, the reduction was not significant. The yields of both the component crops i.e. cluster bean and cabbage reduced significantly in the intercropping over their soul cropping. In the intercropping treatments the yield of cluster bean was significantly higher when it was sown with potato in 1:1 ratio over the 2:1 ratio. However, the yield of cabbage was not affected in the intercropping due to cropping geometry. The LER (Land Equivalent Ratio) data showed that there was an intercrop advantage under all the combinations and the advantages were higher when the planting was done in 1:1 ratio with the cluster bean showing a slight advantage over cabbage under the intercropping situation.

**Table 581:** Plant emergence (%) and grade- wise tuber yield (t/ha)

Treatment	Emergence (%)	Grade-wise yield of tubers (t/ha)				
		0-25g	25-50g	50-75g	>75g	Total
T1	91.33	7.20	5.77	7.12	6.42	32.62
T4	91.00	6.60	8.16	5.34	5.27	30.75
T5	90.33	7.68	6.77	4.91	3.73	28.30
T6	90.67	7.68	8.42	4.91	4.95	29.86
T7	90.33	6.99	5.60	4.91	3.82	27.69
SEd	1.02	2.32	1.59	0.92	0.87	4.39
CD (0.05)	NS	NS	NS	NS	NS	NS
CV %	1.38	39.37	28.06	20.81	21.92	18.00

**Table 582:** Plant emergence (%) and total yield (t/ha) of Cluster bean and cabbage

Treatments	Emergence (%)	Total yield (t/ha)	Treatments	Emergence (%)	Total yield (t/ha)
T2	72.67	24.98	T3	89.33	11.92
T4	73.33	17.15	T5	86.00	7.78
T6	67.33	9.86	T7	88.33	6.63
SEd	1.79	0.57	SEd	4.01	0.69
CD (0.05)	NS	1.62	CD (0.05)	NS	1.96
CV %	3.07	4.00	CV %	5.59	9.59

**Table 583:** Incidence of diseases/pests on potato.

Treatment	Late blight (%)	Leaf spot diseases (%)	Viral diseases (%)
T1	0	0	4.30
T4	0	0	3.50
T5	0	0	3.70
T6	0	0	3.60
T7	0	0	3.70

**Table 584:** Economics and net returns

Treat-ments	Yield (t/ha)	Cost of cultivation (Rs/ha)			Sale price (Rs/t)	Cost (Rs/ha)		Net returns* (Rs/ha)	Total Net returns* (Rs/ha)	B:C ratio	Total B:C ratio
		Seed	Fertilizer	Cultivation		Inputs	Produce				
T1	32.62	40000	9154	28792	10000	77946	326200	248254	248254	3.18	3.18
T2	24.98	40500	5028	17940	3000	63468	74940	11472	11472	0.18	0.18
T3	11.92	200	8064	18084	8000	26348	95360	69012	69012	2.62	2.62
T4 (1:1)	30.75	40000	9154	28792	10000	77946	307500	229554	217536	2.95	1.54
	17.15	40500	5028	17940	3000	63468	51450	-12018		-0.19	
T5 (1:1)	28.3	40000	9154	28792	10000	77946	283000	205054	240946	2.63	2.31
	7.78	200	8064	18084	8000	26348	62240	35892		1.36	
T6 (2:1)	29.86	40000	9154	28792	10000	77946	298600	220654	186766	2.83	1.32
	9.86	40500	5028	17940	3000	63468	29580	-33888		-0.53	
T7 (2:1)	27.69	40000	9154	28792	10000	77946	276900	198954	225646	2.55	2.16
	6.63	200	8064	18084	8000	26348	53040	26692		1.01	

## AGRON. 2: NITROGEN REQUIREMENT OF NEWLY RELEASED POTATO CULTIVARS

Six newly released potato cultivars viz., Kufri Surya, Kufri Sadabahar, Kufri Himalini, Kufri Giridhari, Kufri Jyoti and Kufri Shailja were evaluated at nine different locations viz., Bhubaneshwar, Dholi, Faizabad, Gwalior, Hisar, Jorhat, Kalyani, Patna and Pune for their nitrogen requirements.

**Table 585:** Experimental and treatments details at different locations.

Centers	Year	Design	Rep	Plot size Gross (m <sup>2</sup> )	Plot size Net (m <sup>2</sup> )	Variety	Date of Planting	Date of Haulm cutting	Date of Harvesting
BHN	2016-17	RBD	4	10.80	9.00	K Surya	21.11.16	30.01.17	05.02.17
DHL	2016-17	RBD	4	19.20	12.96	K Surya	09.11.16	28.02.17	15.03.17
FZB	2016-17	RBD	4	19.20	12.96	V1: K Surya V2: K Sadabahar	16.11.16	20.02.17	26.02.17
GWL	2016-17	RBD	4	12.60	9.00	K Surya	24.10.16	27.01.17	06.02.17
HIS	2016-17	RBD	4	16.32	10.80	V1: K Surya V2: K Sadabahar	25.10.16	03.02.17	19.02.17
JRH	2016-17	RBD	3	9.00	5.20	V1: K Himalini V2: K Giridhari V3: K Jyoti	12.11.16	11.02.17	18.02.17
KAL	2016-17	RBD	4	10.50	7.50	V1: K Shailja V2: K Himalini	26.11.16	19.02.17	01.03.17
PAT	2016-17	RBD	4	14.40	10.80	K Surya	20.11.16	15.02.17	09.03.17
PUN	2016-17	RBD	4	16.32	9.00	K Surya	07.11.16	08.02.17	15.02.17

### Treatments

- Recently released potato Varieties
- Nitrogen levels (kg/ha) : N0: 0 N1: 75 N2: 150 N3: 225 N4: 300

### BHUBANESWAR

Increase in yield of variety Kufri Surya was observed with increase in level of nitrogen up to 225 kg/ha however, significant increase was only up to 150 kg/ha. Maximum tuber yield (22.51 t/ha) was recorded at nitrogen dose of 225 Kg/ha followed by (21.00 t/ha) 150 Kg N/ha application. Maximum net return was obtained with treatment having 225 kg/ha (Rs. 63,330) of nitrogen doses followed by 150 kg/ha (Rs. 52,600).

Recommended dose of N: P: K (kg/ha) : 150:80:100

**Table 586:** Initial Soil fertility status of the experimental plot

Soil texture	OC*	pH	Av N (kg/ha)	Av P (kg/ha)	Av K (kg/ha)
Sandy loam	0.209	5.2	212.5	43.562	205.63

\*OC = Organic Carbon

**Table 587:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
				0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
N0	98.50	49.03	2.65	1.44	3.30	3.40	3.26	11.40	18.23	2.08	0.54
N1	97.50	49.28	2.73	1.66	3.75	4.11	4.29	13.81	18.57	2.56	0.80
N2	87.25	50.58	2.63	1.55	5.46	6.38	7.61	21.00	18.73	3.94	0.96
N3	84.75	51.23	2.48	1.59	4.99	5.54	10.39	22.51	18.59	4.19	1.12



N4	85.75	50.00	2.43	1.53	4.11	4.31	5.33	15.28	18.56	2.84	1.04
SEd	1.60	0.77	0.11	0.13	0.22	0.20	0.50	0.84	0.15	0.15	0.01
CD(0.05)	3.52	NS	NS	NS	0.48	0.44	1.10	1.84	NS	0.34	0.03
CV %	2.49	2.17	6.13	11.72	7.07	5.94	11.42	7.04	1.13	6.99	2.23

**Table 588:** Soil properties: N, P, K, removal (kg/ha) by the crop

Treatments	Nutrients applied (kg/ha)			Available status of soil after harvesting		
	N	P	K	Av. N	Av. P	Av. K
N0	0	80	100	225.00	56.30	256.70
N1	75	80	100	187.50	52.57	170.68
N2	150	80	100	200.00	56.30	188.16
N3	225	80	100	187.00	47.82	141.12
N4	300	80	100	200.00	45.86	165.31

**Table 589:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
N0	11.40	50000	8700	53000	111700	91200	8000	-20500	-0.18
N1	13.81	50000	10050	53500	113550	110480	8000	-3070	-0.03
N2	21.00	50000	11400	54000	115400	168000	8000	52600	0.46
N3	22.51	50000	12750	54000	116750	180080	8000	63330	0.54
N4	15.28	50000	14100	53500	117600	122240	8000	4640	0.04

## DHOLI

Significant increase in yield and net return was observed with increase in level of nitrogen up to 300 kg/ha in variety Kufri Surya at Dholi conditions. This treatment produced highest yield of 22.85 t/ha with net return of Rs. 1, 09,000.

Recommended dose of N: P: K (kg/ha) : 150:90:100

**Table 590:** Initial Soil fertility status of the experimental plot

Soil texture	OC*	pH	Av N (kg/ha)	Av P (kg/ha)	Av K (kg/ha)
Sandy loam Calciorthent		8.4	196	16.7	98.3

\*OC = Organic Carbon

**Table 591:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
				0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
N0	94.88	25.75	3.75	1.56	2.20	2.41	3.84	10.02	19.73	2.34	0.46
N1	97.43	36.43	4.60	1.66	3.63	4.32	5.77	15.39	19.43	2.91	0.78
N2	95.55	38.63	5.33	1.55	4.38	6.51	7.70	19.59	17.90	3.47	0.78
N3	97.20	44.50	6.38	1.49	5.00	6.93	8.46	21.71	17.53	3.48	0.91
N4	96.85	48.93	6.63	1.54	5.27	7.18	8.78	22.85	17.05	3.50	0.96
SEd	NS	2.23	0.45	NS	0.32	0.70	0.45	1.10	1.58	0.29	0.11
CD(0.05)	2.03	1.01	0.21	0.08	0.14	0.32	0.21	0.50	0.72	0.13	0.05
CV %	2.98	3.68	5.45	7.00	4.95	8.20	4.21	3.94	5.53	5.99	8.84

**Table 592:** Soil properties: N, P, K, removal (kg/ha) by the crop

Treatments	Nutrients applied (kg/ha)			Nutrients removed (kg/ha)			Available status of soil after harvesting (kg/ha)		
	N	P	K	N	P	K	Av. N	Av. P	Av. K
N0	0.0	90.0	100.0	29.4	15.1	61.3	165.4	25.4	122.4
N1	75.0	90.0	100.0	71.5	18.1	92.4	225.3	23.2	110.6
N2	150.0	90.0	100.0	84.5	22.3	96.5	248.4	17.4	105.3
N3	225.0	90.0	100.0	96.4	24.6	106.3	298.8	16.6	103.8
N4	300.0	90.0	100.0	104.8	30.5	112.4	310.7	16.6	100.0

**Table 593:** Soil properties: Effect on soil fertility

Treatments	Nutrient balance (kg/ha)*			Soil fertility after the complete sequence (kg/ha)			Change in soil fertility (kg/ha)**		
	N	P	K	N	P	K	Av. N	Av. P	Av. K
N0	(-)29.4	74.7	38.7	165.4	25.4	122.4	-30.6	8.7	24.1
N1	3.5	71.9	7.6	225.3	23.2	110.6	29.0	6.5	12.3
N2	65.5	67.7	3.5	248.4	17.4	105.3	52.4	0.7	7.0
N3	128.6	65.4	(-)6.30	298.8	16.6	103.8	102.8	(-) 0.10	5.5
N4	196.0	59.5	(-) 12.40	310.7	16.6	100.0	114.7	(-) 0.10	1.7

Av= Available

\* Nutrient balance = Total nutrient applied - Total nutrient removed

\*\* Change in soil fertility = soil fertility after the complete sequence - initial soil fertility

**Table 594:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
N0	10.02	30000	3800	36000	69800	80160	8000	10360	0.15
N1	15.39	30000	4800	36000	70800	123120	8000	52320	0.74
N2	19.59	30000	5800	36000	71800	156720	8000	84920	1.18
N3	21.71	30000	6800	36000	72800	173680	8000	100880	1.39
N4	22.85	30000	7800	36000	73800	182800	8000	109000	1.48

**FAIZABAD**

Variety Kufri Surya and Kufri Sadabahar produced maximum tuber yield of 42.93 t/ha and 39.21 t/ha respectively with 225 kg N/ha application. In both the varieties, significant increase in yield was observed with increase in level of nitrogen up to 225 kg/ha. On dry weight basis, the same treatment produced maximum tuber yield of 7.60 t/ha for Kufri Surya and 6.92 t/ha for Kufri Sadabahar. Whereas, 300 kg/ha application recorded highest haulm yield on dry weight basis for both varieties (5.27 and 5.26 t/ha).

Recommended dose of N: P: K (kg/ha) : 150:100:120

**Table 595:** Initial soil fertility status of the experimental plot

Treatments	Soil Texture	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
V1N0	Clay loam	0.36	7.98	129.4	15	226.1
V1N1		0.36	7.96	134.4	15	227.3
V1N2		0.36	7.96	137.4	15	227.3
V1N3		0.36	7.96	137.4	15	227.3
V1N4		0.36	7.96	138.4	15	227.3
V2N0		0.36	7.97	129.4	15	226.1
V2N1		0.36	7.96	134.4	15	227.3
V1N2		0.36	7.96	137.4	15	227.3
V2N3		0.36	7.96	137.4	15	227.3
V2N4		0.36	7.96	138.4	15	227.3

\*OC = Organic Carbon

**Table 596:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)						Plant height (cm)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	92.19	92.36	92.36	93.40	93.81	92.82	48.65	68.15	77.50	81.35	82.95	71.72
V2	92.25	93.29	93.23	93.75	93.58	93.22	45.35	68.30	78.55	81.50	83.15	71.37
Means	92.22	92.82	92.80	93.58	93.69		47.00	68.23	78.03	81.43	83.05	
SE (V)	0.21						1.35					
SE (N)	0.33						2.13					
SE (VN)	0.46						3.02					
CD V (5%)	NS						NS					
CD N (5%)	0.68						4.40					
CD VN (5%)	NS						NS					
Treatments	No. of shoots/plant						Yield 0-25g (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	3.90	6.65	7.35	7.80	8.10	6.76	1.35	0.88	1.14	1.20	1.21	1.15
V2	3.50	5.80	6.50	7.20	7.60	6.12	1.82	1.81	1.86	3.07	2.68	2.25
Means	3.70	6.23	6.93	7.50	7.85		1.59	1.34	1.50	2.13	1.95	
SE (V)	0.13						0.04					
SE (N)	0.20						0.06					
SE (VN)	0.28						0.08					
CD V (5%)	0.26						0.08					
CD N (5%)	0.41						0.12					
CD VN (5%)	NS						0.17					
Treatments	Yield 25- 50g (t/ha)						Yield 50-75g (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	6.01	3.62	4.98	6.33	4.94	5.18	6.31	9.02	7.38	8.38	6.02	7.42
V2	5.44	6.04	7.80	7.12	9.20	7.12	8.49	11.98	9.27	9.64	9.01	9.68
Means	5.72	4.83	6.39	6.73	7.07		7.40	10.50	8.33	9.01	7.51	
SE (V)	0.12						0.16					
SE (N)	0.19						0.26					
SE (VN)	0.27						0.37					
CD V (5%)	0.25						0.34					
CD N (5%)	0.39						0.53					
CD VN (5%)	0.56						0.75					
Treatments	Yield >75g (t/ha)						Total yield (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	7.24	20.11	27.30	27.02	28.09	21.95	20.92	33.62	40.79	42.93	40.26	35.70
V2	6.26	15.19	18.21	19.38	17.14	15.23	22.01	35.01	37.13	39.21	38.02	34.28
Means	6.75	17.65	22.75	23.20	22.61		21.46	34.32	38.96	41.07	39.14	
SE (V)	0.37						0.67					
SE (N)	0.59						1.06					
SE (VN)	0.83						1.50					
CD V (5%)	0.77						1.39					
CD N (5%)	1.21						2.19					
CDVN (5%)	1.71						3.10					
Treatments	Dry matter content (%)						Tuber yield on dry weight basis(t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	17.63	17.74	17.81	17.72	17.50	17.68	3.69	5.96	7.26	7.60	7.04	6.31
V2	17.71	17.76	17.81	17.65	17.48	17.68	3.90	6.22	6.61	6.92	6.64	6.06
Means	17.67	17.75	17.81	17.68	17.49		3.79	6.09	6.94	7.26	6.84	
SE (V)	0.02						0.12					
SE (N)	0.04						0.19					
SE (VN)	0.05						0.27					
CD V (5%)	NS						0.24					
CD N (5%)	0.08						0.39					
CDVN (5%)	NS						0.55					
Treatments	Haulm yield on dry weight basis (t/ha)											
	N0	N1	N2	N3	N4	Means						

V1	3.06	4.77	5.26	5.23	5.27	4.72
V2	3.35	5.10	4.98	4.46	5.26	4.63
Means	3.20	4.94	5.12	4.84	5.26	
SE (V)	0.07					
SE (N)	0.10					
SE (VN)	0.15					
CD V ( 5%)	NS					
CD N ( 5%)	0.21					
CDVN (5%)	0.30					
CV (%)						

**Table 597:** Soil properties: N, P, K, removal (kg/ha) by the crop

Treatments	Nutrients applied (kg/ha)		
	N	P	K
V1N0	0	100	120
V1N1	75	100	120
V1N2	150	100	120
V1N3	225	100	120
V1N4	300	100	120
V2N0	0	100	120
V2N1	75	100	120
V1N2	150	100	120
V2N3	225	100	120
V2N4	300	100	120

## GWALIOR

Variety Kufri Surya produced maximum tuber yield of 24.06 t/ha on fresh weight basis (5.39 t/ha on dry weight basis) and net return (Rs. 70,990) was recorded with application of 225 kg/ha nitrogen application. The same treatment produced maximum yield of haulm (1.94 t/ha) on dry weight basis. Rests of the treatment were at par in terms of total yield production. All the treatments improved phosphorous balance in soil but reduced potash balance as the level of nitrogen application increased.

Recommended dose of N: P: K (kg/ha) : 180:80:120

**Table 598:** Initial soil fertility status of the experimental plot

Soil Texture	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
Silty clay loam	0.4	6.3	163	74	293

\*OC = Organic Carbon

**Table 599:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
				0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
N0	90.75	53.90	2.88	0.86	2.00	3.08	13.63	19.56	23.36	4.59	1.82
N1	90.25	50.60	2.88	0.84	1.63	2.40	17.30	22.16	22.81	5.12	1.76
N2	89.50	57.53	2.73	0.62	1.64	3.05	16.23	21.53	23.90	5.15	1.93
N3	91.75	49.93	2.53	1.35	1.58	3.13	18.01	24.06	22.38	5.39	1.94
N4	91.00	52.73	2.46	0.83	2.00	2.45	15.54	20.81	21.18	4.38	1.88
SEd	3.07	2.54	0.29	0.16	0.24	0.31	1.79	1.73	1.08	0.45	0.11
CD(0.05)	NS	NS	NS	0.35	NS	NS	NS	NS	NS	NS	NS
CV %	4.80	6.78	15.42	25.27	19.05	15.36	15.68	11.33	6.69	12.97	8.48

**Table 600:** Soil properties: N, P, K, removal (kg/ha) by the crop

Treatments	Nutrients applied (kg/ha)			Nutrients removed (kg/ha)			Available status of soil after harvesting (kg/ha)		
	N	P	K	N	P	K	Av. N	Av. P	Av. K
N0	0	80	120	168	21	57	169	31	321
N1	75	80	120	245	16	95	176	29	295
N2	150	80	120	171	18	33	182	60	291
N3	225	80	120	228	23	89	157	34	267
N4	300	80	120	114	30	64	169	44	387

**Table 601:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
N0	19.56	35000	5600	29800	70400	117360	6000	46960	0.67
N1	22.16	35000	6590	29800	71390	132960	6000	61570	0.86
N2	21.53	35000	7580	29800	72380	129180	6000	56800	0.78
N3	24.06	35000	8570	29800	73370	144360	6000	70990	0.97
N4	20.81	35000	9560	29800	74360	124860	6000	50500	0.68

**HISAR**

Kufri Surya (38.88 t/ha) and Kufri Sadabahar (43.88 t/ha) showed significant increase in total tuber yield with increase in level of nitrogen up to 225 kg N/ha. For all the treatments, Kufri Sadabahar recorded higher yield, Net return and B:C ratio over Kufri Surya. Application of 225 kg/ha nitrogen recorded maximum net return of Rs. 1,58,499 and B:C ratio of 2.12 for Kufri Surya. The same treatment gave highest net return of Rs. 1,88,499 and B:C ratio of 2.52 for Kufri sadabahar. It indicated that, under Hisar conditions, Kufri Sadabahar was a better performing variety.

Recommended dose of N: P: K (kg/ha) : 150:50:100

**Table 602:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)						Plant height (cm)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	94.95	95.30	96.78	95.73	94.35	95.42	63.23	68.70	76.50	73.83	70.98	70.65
V2	95.70	97.13	95.08	95.40	95.55	95.77	55.98	73.63	70.03	83.58	79.10	72.46
Means	95.33	96.21	95.93	95.56	94.95		59.60	71.16	73.26	78.70	75.04	
SE (V)	0.61						2.28					
SE (N)	0.96						3.61					
SE (VN)	1.36						5.10					
CD V (5%)	NS						NS					
CD N (5%)	NS						7.45					
CD VN (5%)	NS						NS					
Treatments	No. of shoots/plant						Yield 0-25g (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	4.10	5.05	5.05	5.60	5.40	5.04	2.20	1.53	2.05	2.83	2.63	2.25
V2	3.90	4.30	4.40	4.75	5.10	4.49	2.95	1.88	1.43	1.63	2.00	1.98
Means	4.00	4.68	4.73	5.18	5.25		2.58	1.70	1.74	2.23	2.31	
SE (V)	0.17						0.18					
SE (N)	0.28						0.28					
SE (VN)	0.39						0.39					
CD V (5%)	0.36						NS					
CD N (5%)	0.57						0.57					
CD VN (5%)	NS						0.81					
Treatments	Yield 25- 50g (t/ha)						Yield 50-75g (t/ha)					

	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	3.93	4.55	4.83	5.73	5.30	4.87	5.35	6.90	10.00	8.53	8.20	7.80
V2	4.43	5.43	5.78	6.28	5.90	5.56	6.75	8.20	8.80	10.35	9.53	8.73
Means	4.18	4.99	5.30	6.00	5.60		6.05	7.55	9.40	9.44	8.86	
SE (V)	0.10						0.24					
SE (N)	0.16						0.39					
SE (VN)	0.23						0.54					
CD V ( 5%)	0.21						0.50					
CD N ( 5%)	0.33						0.79					
CD VN (5%)	NS						1.12					
Treatments	Yield >75g (t/ha)						Total yield (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	15.38	18.58	22.25	21.80	21.48	19.90	26.85	31.53	36.35	38.88	37.55	34.23
V2	17.18	20.40	22.18	25.68	25.58	22.20	31.28	35.88	38.13	43.88	42.98	38.43
Means	16.28	19.49	22.21	23.74	23.53		29.06	33.70	37.24	41.38	40.26	
SE (V)	0.59						0.71					
SE (N)	0.93						1.12					
SE (VN)	1.32						1.58					
CD V ( 5%)	1.22						1.46					
CD N ( 5%)	1.93						2.30					
CDVN (5%)	NS						NS					
Treatments	Dry matter content (%)						Tuber yield on dry weight basis(t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	18.58	18.10	17.90	17.48	17.38	17.89	5.01	5.70	5.99	6.80	6.55	6.01
V2	17.98	17.00	16.80	16.58	16.18	16.91	5.62	6.10	6.41	7.28	6.95	6.47
Means	18.28	17.55	17.35	17.03	16.78		5.32	5.90	6.20	7.04	6.75	
SE (V)	0.27						0.16					
SE (N)	0.43						0.26					
SE (VN)	0.61						0.36					
CD V ( 5%)	0.57						0.34					
CD N ( 5%)	0.90						0.53					
CDVN (5%)	NS						NS					
Treatments	Haulm yield on dry weight basis (t/ha)											
	N0	N1	N2	N3	N4	Means						
V1	1.51	1.74	2.27	3.20	2.74	2.29						
V2	1.34	3.27	3.65	3.92	3.82	3.20						
Means	1.43	2.51	2.96	3.56	3.28							
SE (V)	0.24											
SE (N)	0.37											
SE (VN)	0.53											
CD V ( 5%)	0.49											
CD N ( 5%)	0.77											
CDVN (5%)	NS											

**Table 603: Economics**

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
V1N0	26.85	25000	0	42199	67199	161100	6000	93901	1.40
V1N1	31.53	25000	5707	42199	72906	189180	6000	116274	1.59
V1N2	36.35	25000	6645	42199	73844	218100	6000	144256	1.95
V1N3	38.88	25000	7582	42199	74781	233280	6000	158499	2.12
V1N4	37.55	25000	8520	42199	75719	225300	6000	149581	1.98
V2N0	31.28	25000	0	42199	67199	187680	6000	120481	1.79
V2N1	35.88	25000	5707	42199	72906	215280	6000	142374	1.95
V1N2	38.13	25000	6645	42199	73844	228780	6000	154936	2.10
V2N3	43.88	25000	7582	42199	74781	263280	6000	188499	2.52
V2N4	42.98	25000	8520	42199	75719	257880	6000	182161	2.41

## JORHAT

An increase in tuber yield of Kufri Himalini, Kufri Girdhari and Kufri Jyoti was observed up to 300 kg N/ha and had showed a liner trend of increase in tuber yield with increase in level of nitrogen application till 300 kg/ha. Nitrogen application @ 300 kg/ha also produced highest mean tuber yield and dry matter yield with higher net return in all three varieties.

Recommended dose of N: P: K (kg/ha) : 120:100:100

**Table 604:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha), concentration of NPK in haulm & tuber (%), NPK uptake by potato haulm & tuber (kg/ha) and total NPK uptake (kg/ha).

Treatments	Emergence (%)						Plant height (cm)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	90.00	97.50	95.83	95.83	95.83	95.00	32.24	33.97	34.22	35.27	35.95	34.33
V2	93.33	94.17	95.83	96.67	98.33	95.67	32.63	33.10	34.66	35.07	37.37	34.57
V3	92.50	94.17	92.50	94.17	98.33	94.33	32.04	33.99	34.57	35.45	36.92	34.59
Means	91.94	95.28	94.72	95.56	97.50		32.30	33.68	34.48	35.26	36.75	
SE (V)	0.99						0.24					
SE (N)	1.28						0.32					
SE (VN)	2.21						0.55					
CD V (5%)	NS						NS					
CD N (5%)	2.63						0.65					
CD VN (5%)	NS						NS					
Treatments	No. of shoots/plant						Yield 0-25g (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	3.53	3.67	4.13	4.40	4.93	4.13	1.66	2.13	1.66	1.56	2.34	1.87
V2	3.00	4.17	4.27	4.73	4.80	4.19	1.09	1.87	1.92	1.77	2.92	1.91
V3	3.07	4.07	4.13	4.73	4.93	4.19	1.92	1.77	2.13	1.72	2.76	2.06
Means	3.20	3.97	4.18	4.62	4.89		1.56	1.92	1.90	1.68	2.67	
SE (V)	0.12						0.24					
SE (N)	0.15						0.31					
SE (VN)	0.27						0.54					
CD V ( 5%)	NS						NS					
CD N ( 5%)	0.32						0.65					
CD VN (5%)	NS						NS					
Treatments	Yield 25- 50g (t/ha)						Yield 50-75g (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	5.57	7.29	7.65	6.87	10.36	7.55	4.27	5.67	6.98	8.17	7.13	6.44
V2	6.87	6.30	8.02	7.65	10.93	7.96	3.64	6.40	4.75	7.34	8.12	6.05
V3	6.35	8.95	7.42	9.63	8.69	8.21	4.84	5.31	6.87	6.82	7.70	6.31
Means	6.26	7.51	7.70	8.05	10.00		4.25	5.79	6.20	7.44	7.65	
SE (V)	0.59						0.59					
SE (N)	0.76						0.76					
SE (VN)	1.32						1.32					
CD V ( 5%)	NS						NS					
CD N ( 5%)	1.57						1.56					
CD VN (5%)	NS						NS					
Treatments	Yield >75g (t/ha)						Total yield (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	4.92	5.62	7.50	9.58	9.42	7.41	16.43	20.72	23.79	26.19	29.27	23.28
V2	5.06	5.52	6.79	7.97	7.65	6.60	16.67	20.10	21.48	24.73	29.63	22.52
V3	4.68	5.41	6.66	6.82	8.75	6.46	17.80	21.45	23.10	24.99	27.91	23.05
Means	4.89	5.52	6.98	8.12	8.61		16.97	20.76	22.79	25.30	28.94	
SE (V)	0.56						0.77					
SE (N)	0.73						0.99					
SE (VN)	1.26						1.72					
CD V ( 5%)	NS						NS					
CD N ( 5%)	1.50						2.04					
CDVN (5%)	NS						NS					
Treatments	Tuber dry matter content(%)						Haulm dry matter content (%)					

	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	16.30	17.10	17.47	17.73	18.63	17.45	10.37	10.80	11.33	11.90	12.80	11.44
V2	16.60	17.27	17.50	17.80	19.07	17.65	10.80	11.43	11.77	12.30	13.27	11.91
V3	16.87	17.27	17.63	18.77	18.93	17.89	10.57	11.03	11.90	12.57	13.07	11.83
Means	16.59	17.21	17.53	18.10	18.88		10.58	11.09	11.67	12.26	13.04	
SE (V)	0.19						0.16					
SE (N)	0.25						0.21					
SE (VN)	0.43						0.36					
CD V ( 5%)	NS						0.33					
CD N ( 5%)	0.51						0.43					
CDVN (5%)	NS						NS					
Treatments	Tuber yield on dry weight basis (t/ha)						Haulm yield on dry weight basis (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	3.29	3.94	4.46	4.67	4.78	4.23	1.60	1.94	2.14	2.42	2.61	2.14
V2	3.35	3.79	4.11	4.39	4.95	4.12	1.81	2.03	2.15	2.38	2.63	2.20
V3	3.12	3.67	4.06	4.36	4.62	3.96	1.65	2.08	2.24	2.39	2.51	2.17
Means	3.26	3.80	4.21	4.47	4.78		1.68	2.02	2.18	2.40	2.58	
SE (V)	0.13						0.09					
SE (N)	0.17						0.11					
SE (VN)	0.29						0.20					
CD V ( 5%)	NS						NS					
CD N ( 5%)	0.35						0.23					
CDVN (5%)	NS						NS					
Treatments	Concentration of nitrogen in haulm (%)						Nitrogen uptake by potato haulm (kg/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	0.75	1.31	1.36	1.42	1.60	1.29	11.93	25.40	29.24	34.39	41.68	28.53
V2	0.76	1.30	1.37	1.44	1.63	1.30	13.58	26.35	29.46	34.23	43.00	29.32
V3	0.92	1.28	1.37	1.49	1.58	1.33	14.31	26.85	30.61	35.49	39.63	29.38
Means	0.81	1.30	1.37	1.45	1.60		13.27	26.20	29.77	34.70	41.44	
SE (V)	0.03						0.97					
SE (N)	0.04						1.26					
SE (VN)	0.06						2.18					
CD V ( 5%)	NS						NS					
CD N ( 5%)	0.07						2.59					
CDVN (5%)	NS						NS					
Treatments	Concentration of nitrogen in tuber (%)						Nitrogen uptake by potato tuber (kg/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	1.58	2.20	2.25	2.32	2.41	2.15	51.55	86.49	100.18	108.39	115.61	92.44
V2	1.60	2.18	2.27	2.34	2.44	2.17	53.33	82.57	93.09	102.66	120.48	90.43
V3	1.48	2.20	2.27	2.34	2.41	2.14	46.20	80.61	92.12	101.77	111.43	86.43
Means	1.56	2.19	2.26	2.33	2.42		50.36	83.22	95.13	104.27	115.84	
SE (V)	0.02						3.25					
SE (N)	0.03						4.19					
SE (VN)	0.05						7.27					
CD V ( 5%)	NS						NS					
CD N ( 5%)	0.06						8.64					
CDVN (5%)	NS						NS					
Treatments	Concentration of Phosphorus in haulm (%)						Phosphorous uptake by potato haulm (kg/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	0.63	0.69	0.67	0.69	0.70	0.68	10.04	13.35	14.43	16.64	18.32	14.56
V2	0.61	0.67	0.67	0.66	0.70	0.66	11.00	13.63	14.39	15.69	18.39	14.62
V3	0.62	0.69	0.67	0.67	0.70	0.67	10.10	14.44	14.97	15.94	17.60	14.61
Means	0.62	0.68	0.67	0.67	0.70		10.38	13.81	14.60	16.09	18.10	
SE (V)	0.01						0.63					
SE (N)	0.01						0.81					
SE (VN)	0.03						1.40					
CD V ( 5%)	NS						NS					
CD N ( 5%)	0.03						1.66					
CDVN (5%)	NS						NS					
Treatments	Concentration of phosphorus in tuber (%)						Phosphorous uptake by potato tuber (kg/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	0.84	0.89	0.87	0.90	0.91	0.88	27.74	35.02	38.80	41.92	43.61	37.42
V2	0.83	0.88	0.89	0.90	0.92	0.89	27.79	33.37	36.58	39.64	45.46	36.57
V3	0.84	0.86	0.87	0.90	0.91	0.88	26.24	31.64	35.29	39.21	41.92	34.86



Means	0.84	0.88	0.88	0.90	0.91		27.26	33.34	36.89	40.26	43.66	
SE (V)	0.01						1.35					
SE (N)	0.01						1.74					
SE (VN)	0.02						3.01					
CD V ( 5%)	NS						NS					
CD N ( 5%)	0.03						3.58					
CDVN (5%)	NS						NS					
Treatments	Concentration of potassium in haulm (%)						Potassium uptake by potato haulm (kg/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	0.64	0.65	0.69	0.69	0.72	0.68	10.16	12.68	14.72	16.83	18.90	14.66
V2	0.63	0.64	0.69	0.70	0.73	0.68	11.41	12.98	14.96	16.75	19.24	15.07
V3	0.63	0.65	0.69	0.68	0.71	0.67	10.46	13.62	15.34	16.36	17.77	14.71
Means	0.63	0.65	0.69	0.69	0.72		10.68	13.09	15.01	16.65	18.64	
SE (V)	0.01						0.75					
SE (N)	0.01						0.97					
SE (VN)	0.02						1.67					
CD V ( 5%)	NS						NS					
CD N ( 5%)	0.03						1.99					
CDVN (5%)	NS						NS					
Treatments	Concentration of potassium in tuber (%)						Potassium uptake by potato tuber (kg/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	1.59	1.61	1.65	1.67	1.68	1.64	52.35	63.46	73.69	78.01	79.99	69.50
V2	1.62	1.63	1.68	1.70	1.70	1.67	54.29	61.62	69.14	74.44	83.78	68.65
V3	1.60	1.63	1.68	1.72	1.74	1.67	50.05	59.57	67.96	74.88	80.56	66.61
Means	1.61	1.62	1.67	1.70	1.71		52.23	61.55	70.26	75.78	81.44	
SE (V)	0.01						2.16					
SE (N)	0.01						2.79					
SE (VN)	0.02						4.83					
CD V ( 5%)	0.01						NS					
CD N ( 5%)	0.02						5.74					
CDVN (5%)	NS						NS					
Treatments	Total Nitrogen uptake (kg/ha)						Total phosphorous uptake (kg/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	63.48	111.88	129.42	142.78	157.28	120.97	37.78	48.38	53.32	58.56	56.33	50.88
V2	66.91	108.91	122.55	136.89	163.48	119.75	38.79	47.01	50.97	55.33	63.84	51.19
V3	60.52	107.46	122.72	137.26	151.06	115.81	36.34	46.08	50.26	55.15	59.52	49.47
Means	63.64	109.42	124.90	138.98	157.27		37.64	47.15	51.52	56.35	59.90	
SE (V)	3.39						1.85					
SE (N)	4.38						2.39					
SE (VN)	7.58						4.14					
CD V ( 5%)	NS						NS					
CD N ( 5%)	9.01						4.92					
CDVN (5%)	NS						NS					
Treatments												
	N0	N1	N2	N3	N4	Means						
V1	62.51	76.14	88.41	94.84	98.89	84.16						
V2	65.70	74.59	84.10	93.13	103.02	84.11						
V3	60.51	73.19	83.31	91.24	98.33	81.32						
Means	62.91	74.64	85.27	93.07	100.08							
SE (V)	2.26											
SE (N)	2.92											
SE (VN)	5.05											
CD V ( 5%)	NS											
CD N ( 5%)	6.00											
CDVN (5%)	NS											

**Table 605: Economics**

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
V1N0	16.43	50000	9238	16840	76078	197160	12000	121082	1.59
V1N1	20.72	50000	10705	16840	77545	248640	12000	171095	2.21

V1N2	23.79	50000	12172	16840	79012	285480	12000	206468	2.61
V1N3	26.19	50000	13630	16840	80470	314280	12000	233810	2.91
V1N4	29.27	50000	15097	16840	81937	351240	12000	269303	3.29
V2N0	16.67	50000	9238	16840	76078	200040	12000	123962	1.63
V2N1	20.10	50000	10705	16840	77545	241200	12000	163655	2.11
V2N2	21.48	50000	12172	16840	79012	257760	12000	178748	2.26
V2N3	24.73	50000	13630	16840	80470	296760	12000	216290	2.69
V2N4	29.63	50000	15097	16840	81937	355560	12000	273623	3.34
V3N0	17.80	50000	9238	16840	76078	213600	12000	137522	1.81
V3N1	21.45	50000	10705	16840	77545	257400	12000	179855	2.32
V3N2	23.10	50000	12172	16840	79012	277200	12000	198188	2.51
V3N3	24.99	50000	13630	16840	80470	299880	12000	219410	2.73
V3N4	27.91	50000	15097	16840	81937	334920	12000	252983	3.09

## KALYANI

Both Kufri Himalini and Kufri Shailja had similar performance for plant emergence. Tuber yield of both varieties increased significantly with increased level of nitrogen application up to 300 kg N/ha. Maximum tuber yield of 29.29 t/ha and 37.03 t/ha for Kufri Himalini and Kufri Shailja was produced with 300 kg N/ha application. The net return and B:C ratios also showed the similar trend and were highest for the same treatment.

**Table 606:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)						No. of shoots/plant					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	46.25	57.25	66.75	72.00	75.25	63.50	2.90	3.58	4.33	4.75	4.90	4.09
V2	45.45	56.73	68.23	73.10	79.78	64.66	2.83	3.68	4.30	4.78	5.08	4.13
Means	45.85	56.99	67.49	72.55	77.51		2.86	3.63	4.31	4.76	4.99	
SE (V)	1.00						0.12					
SE (N)	1.58						0.19					
SE (VN)	2.24						0.27					
CD V ( 5%)	NS						NS					
CD N ( 5%)	3.27						0.39					
CD VN (5%)	NS						NS					
	Yield 0-25g (t/ha)						Yield 25-50g (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	2.67	3.27	3.73	4.00	4.27	3.59	4.00	4.60	6.20	6.63	6.67	5.62
V2	3.90	3.73	4.40	5.27	6.30	4.72	5.20	5.83	6.40	7.07	7.20	6.34
Means	3.28	3.50	4.07	4.64	5.28		4.60	5.22	6.30	6.85	6.93	
SE (V)	0.23						0.24					
SE (N)	0.36						0.38					
SE (VN)	0.51						0.54					
CD V ( 5%)	0.47						0.50					
CD N ( 5%)	0.75						0.79					
CD VN (5%)	NS						NS					
	Yield 50-75g (t/ha)						Yield >75g (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	4.77	6.43	7.23	7.46	8.63	6.90	4.30	6.90	8.16	8.63	9.53	7.51
V2	6.13	7.83	8.73	9.53	10.57	8.56	7.17	9.43	10.66	12.13	12.97	10.47
Means	5.45	7.13	7.98	8.50	9.60		5.73	8.16	9.41	10.38	11.25	
SE (V)	0.26						0.33					
SE (N)	0.41						0.52					
SE (VN)	0.59						0.74					
CD V ( 5%)	0.54						0.68					
CD N ( 5%)	0.85						1.08					
CD VN (5%)	NS						NS					
	Total yield (t/ha)						Tuber yield on dry weight basis (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means

V1	15.73	21.19	25.33	26.73	29.09	23.61	3.13	4.17	5.04	5.30	5.73	4.67
V2	22.40	26.83	30.19	33.99	37.03	30.09	4.30	5.17	5.83	6.40	7.07	5.75
Means	19.06	24.01	27.76	30.36	33.06		3.72	4.67	5.43	5.85	6.40	
SE (V)	0.49						0.10					
SE (N)	0.77						0.16					
SE (VN)	1.09						0.23					
CD V ( 5%)	1.00						0.21					
CD N ( 5%)	1.59						0.34					
CD VN (5%)	NS						NS					
CV (%)												
	Haulm yield on dry weight basis (t/ha)											
	N0	N1	N2	N3	N4	Means						
V1	2.17	2.57	2.94	3.30	3.57	2.91						
V2	2.20	3.27	3.93	4.57	5.10	3.81						
Means	2.18	2.92	3.43	3.93	4.34							
SE (V)	0.12											
SE (N)	0.20											
SE (VN)	0.28											
CD V ( 5%)	0.26											
CD N ( 5%)	0.40											
CD VN (5%)	0.57											

**Table 607:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
V1N0	15.73	32000	12004	50000	94004	94380	6000	376	0.00
V1N1	21.19	32000	12978	50000	94978	127140	6000	32162	0.34
V1N2	25.33	32000	13960	50000	95960	151980	6000	56020	0.58
V1N3	26.73	32000	14938	50000	96938	160380	6000	63442	0.65
V1N4	29.09	32000	15916	50000	97916	174540	6000	76624	0.78
V2N0	22.40	32000	12004	50000	94004	134400	6000	40396	0.43
V2N1	26.83	32000	12978	50000	94978	160980	6000	66002	0.69
V2N2	30.99	32000	13960	50000	95960	185940	6000	89980	0.94
V2N3	33.99	32000	14938	50000	96938	203940	6000	107002	1.10
V2N4	37.03	32000	15916	50000	97916	222180	6000	124264	1.27

## PATNA

For Kufri Surya, increase in total tuber yield was observed with increase in level of nitrogen application up to 225 kg/ha nitrogen application. This treatment produced 28.33 t/ha total tuber yield. The increase in yields was significant over other nitrogen levels.

Recommended dose of N: P: K (kg/ha) : 150:60:80

**Table 608:** Plant emergence (%), morphological traits and grade-wise tuber yield (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/ plant	Grade-wise yield (t/ha)				
				0-25g	25-50g	50-75g	>75g	Total
N0	96.50	26.50	3.63	3.20	2.82	4.80	4.68	15.49
N1	96.00	33.25	4.03	2.69	3.87	7.52	7.32	21.39
N2	95.25	33.25	3.73	2.59	4.64	9.89	8.20	25.32
N3	95.50	34.75	3.85	1.99	4.79	11.30	10.26	28.33
N4	94.25	35.75	3.70	2.59	4.90	10.06	9.17	26.72
SEd	1.16	1.74	0.35	0.26	0.45	0.66	0.63	1.15
CD(0.05)	NS	3.84	NS	0.58	0.99	1.45	1.39	2.54
CV %	1.72	7.54	13.13	14.29	15.13	10.71	11.27	6.96

## PUNE

At Pune conditions, Kufri Surya produced increased in yield with increased in dose of nitrogen; however, it was not significant. Maximum net return (Rs. 89,983) and B: C ratio (1.11) was recorded with recommended dose of nitrogen application @ 150 kg/ha.

Recommended dose of N: P: K (kg/ha) : 150:60:120

**Table 609:** Initial soil fertility status of the experimental plot

Treatments	Soil Texture	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
N0	Light black	0.70	7.20	183.00	34.00	356.00
N1		0.70	7.30	180.00	37.00	360.00
N2		0.70	7.20	181.00	35.00	354.00
N3		0.70	7.40	180.00	34.00	354.00
N4		0.70	7.20	183.00	36.00	357.00

\*OC = Organic Carbon

**Table 610:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
				0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
N0	86.75	37.19	2.51	1.21	3.27	4.51	2.36	11.35	19.55	3.09	1.96
N1	89.24	45.18	3.03	1.33	4.11	4.45	3.52	13.40	19.84	4.51	3.47
N2	90.25	49.88	3.36	1.31	4.39	6.55	4.85	17.10	20.13	5.59	4.32
N3	90.20	51.31	3.46	1.43	3.95	5.86	3.88	15.11	20.34	6.51	4.56
N4	89.75	51.75	3.21	1.28	4.07	5.46	3.53	14.33	20.67	6.67	4.94
SEd	2.22	0.58	0.23	0.09	0.22	0.14	0.20	0.29	0.14	0.20	0.22
CD(0.05)	NS	1.27	0.51	NS	0.48	0.31	0.44	0.64	0.31	0.45	0.49
CV %	3.52	1.73	10.50	9.49	7.81	3.73	7.80	2.90	0.97	5.43	8.13

**Table 611:** Soil properties: N, P, K, removal (kg/ha) by the crop

Treatments	Nutrients applied (kg/ha)			Nutrients removed (kg/ha)			Available status of soil after harvesting (kg/ha)		
	N	P	K	N	P	K	Av. N	Av. P	Av. K
N0	0	60	120	31.30	16.10	68.25	176.40	26.05	118.50
N1	75	60	120	75.18	18.50	100.50	220.15	25.00	101.55
N2	150	60	120	89.20	25.15	108.40	245.10	17.80	103.00
N3	225	60	120	107.00	31.20	103.00	290.10	17.45	97.35
N4	300	60	120	115.20	39.45	130.64	310.75	16.25	96.14

**Table 612:** Soil properties: Effect on soil fertility

Treatments	Nutrient balance (kg/ha)*			Soil fertility after the complete sequence (kg/ha)			Change in soil fertility (kg/ha)**		
	N	P	K	N	P	K	Av. N	Av. P	Av. K
N0	31.30	43.90	51.75	176.40	26.05	118.50	6.60	7.95	237.50
N1	0.18	41.50	19.50	220.15	25.00	101.55	37.15	9.00	254.45
N2	60.80	34.85	11.60	245.10	17.80	103.00	62.10	16.20	253.00
N3	118.00	28.80	17.00	290.10	17.45	97.35	107.10	16.55	248.90
N4	184.80	20.55	10.64	310.75	16.25	96.14	127.75	17.75	259.86

Av= Available

\* Nutrient balance = Total nutrient applied - Total nutrient removed

\*\* Change in soil fertility = soil fertility after the complete sequence - initial soil fertility

**Table 613:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
N0	11.35	30000	9395	38000	77395	113500	10000	36105	0.47
N1	13.40	30000	11206	38000	79206	134000	10000	54794	0.69
N2	17.10	30000	13017	38000	81017	171000	10000	89983	1.11
N3	15.11	30000	14828	38000	82828	151100	10000	68272	0.82
N4	14.33	30000	16639	38000	84639	143300	10000	58661	0.69

### AGRON.3: DEVELOP SITE SPECIFIC NPK REQUIREMENTS

The trials were conducted at Bhubaneshwar, Chhindwara, Dessa, Dholi, Gwalior, Hisar, Jalandhar, Kalyani, Kota, Pantnagar, Pasighat, Patna and Pune centres. The varieties evaluated under this trial were Kufri Ashoka, Kufri Chipsona-3, Kufri Badshah, Kufri Jyoti, Kufri Bahar, Kufri Pushkar, Kufri Surya, Kufri Khyati and Kufri Pukhraj.

**Table 614:** Experimental and treatments details at different locations.

Center	Year	Design	Rep	Gross plot size (m <sup>2</sup> )	Net plot size (m <sup>2</sup> )	Variety	Spacing (cm)	Date of Planting	Date of Haulm cutting	Date of Harvesting
BHN	2016-17	RBD	4	10.80	9.00	K Ashoka	60x20	21.11.16	27.01.17	07.02.17
CHN	2016-17	RBD	4	17.28	12.96	K Chip-3	60x20	09.11.16	22.02.17	02.03.17
DES	2016-17	RBD	4	16.00	12.00	K Badshah	60x20	17.11.16	26.02.17	26.02.17
DHL	2016-17	RBD	4	19.20	12.96	K Ashoka	60x20	10.11.16	28.02.17	18.03.17
GWL	2016-17	RBD	4	16.80	12.00	K Jyoti	60x20	07.11.16		15.02.17
HIS	2016-17	RBD	4	19.20	12.96	K Bahar	60x20	23.10.16	02.02.17	17.02.17
JAL	2016-17	RBD	4	21.12	14.40	K Jyoti	60x20	11.10.16	12.01.17	19.02.17
KAL	2016-17	RBD	4	10.50	7.50	K Jyoti	60x20	25.11.16	18.02.17	28.02.17
KTT	2016-17	RBD	4	18.00	14.40	K Pushkar	60x20	10.11.16	20.02.17	10.03.17
PNT	2016-17	RBD	3	16.80	12.96	K Surya	60x20	23.10.16	10.02.17	22.02.17
PAS	2016-17	RBD	4	19.20	12.96	K Jyoti	60x20	07.11.16	06.02.17	12.02.17
PAT	2016-17	RBD	4	14.40	10.80	K Khyati	60x20	19.11.16	18.02.17	08.03.17
PUN	2016-17	RBD	4	19.20	9.00	K Surya	60x20	07.11.16	08.02.17	15.02.17
RPR	2016-17	RBD	4	19.20	12.96	K Pukhraj	60x20	15.11.16	13.02.17	20.02.17

#### Treatments of N, P, and K fertilizers

- T1 50% RDF of NPK
- T2 100% RDF of NPK
- T3 150% RDF of NPK
- T4 Without N fertilizer (PK)
- T5 Without P (NK)
- T6 Without K (NP)
- T7 Without NPK (Absolute control)

#### BHUBANESHWAR

Variety Kufri Ashoka recorded maximum tuber yield of 21.98 t/ha with 150 % recommended dose of N,P & K which was at par with treatment receiving 100% of the recommended dose of NPK (20.80 t/ha). As compared to other treatments, treatment without NPK and without N recorded lowest yield of 10.47 t/ha and 13.78 t/ha respectively. It indicated that, at Bhubaneswar conditions, nitrogen was the most limiting nutrient for total yield production. However, treatment without K (application of only N and P) recorded maximum net return of Rs. 74,793 and and B:C ratio of 0.67.

Recommended dose of N: P: K (kg/ha) : 150:80:100

**Table 615:** Initial Soil fertility status of the experimental plot

Soil texture	OC*	pH	Av N (kg/ha)	Av P (kg/ha)	Av K (kg/ha)
Sandyloam	0.21	5.20	212.50	43.56	205.63

\*OC = Organic Carbon

**Table 616:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
				0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	87.68	42.10	3.43	0.94	4.11	6.63	7.12	18.79	15.08	2.83	0.71
T2	94.60	42.83	4.78	0.96	5.33	6.30	8.22	20.80	15.58	3.24	0.72
T3	97.83	41.55	5.03	1.00	6.23	7.06	7.69	21.98	15.94	3.50	0.73
T4	97.10	36.85	3.53	0.82	3.27	4.99	4.69	13.78	14.83	2.04	0.59
T5	91.25	38.00	4.90	1.02	5.52	7.09	4.56	18.18	15.84	2.88	0.64
T6	89.65	41.83	4.90	0.97	3.98	6.41	7.34	18.69	14.33	2.68	0.62
T7	97.68	39.08	3.78	0.95	3.23	3.28	3.02	10.47	13.41	1.40	0.44
SEd	2.87	0.81	0.18	0.19	0.54	0.75	0.83	1.16	0.18	0.18	0.03
CD(0.05)	6.07	1.72	0.39	NS	1.14	1.59	1.76	2.46	0.39	0.39	0.06
CV %	4.33	2.85	5.94	27.94	16.88	17.74	19.33	9.38	1.73	9.80	6.74

**Table 617:** Soil properties: N, P, K, removal (kg/ha) by the crop

Treatments	Nutrients applied (kg/ha)			Available status of soil after harvesting		
	N	P	K	Av. N	Av. P	Av. K
T1	75.00	40.00	50.00	187.50	36.82	0.10
T2	150.00	80.00	100.00	175.00	46.05	103.48
T3	225.00	120.00	150.00	187.50	46.39	150.52
T4	0.00	80.00	100.00	175.00	46.29	217.72
T5	150.00	0.00	100.00	175.00	48.16	159.93
T6	150.00	80.00	0.00	175.00	48.16	196.22
T7	0.00	0.00	0.00	162.50	49.40	72.52

**Table 618:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	18.79	50000	5700	53500	109200	150320	8000	41120	0.38
T2	20.80	50000	11400	54000	115400	166400	8000	51000	0.44
T3	21.98	50000	17100	54500	121600	175840	8000	54240	0.45
T4	13.78	50000	8700	54000	112700	110240	8000	-2460	-0.02
T5	18.18	50000	7080	54000	111080	145440	8000	34360	0.31
T6	18.69	50000	8200	54000	112200	186993	10005	74793	0.67
T7	10.47	50000	0	53000	103000	104763	10006	1763	0.02

## CHHINDWARA

150 % recommended dose of NPK produced maximum highest yield of 27.08 t/ha of variety Kufri Chipsona-3 followed by 100% RDF of NPK (24.07 t/ha), with significant yield differences. Maximum net return (Rs. 72,285) and B:C ratio (0.94) were reported for the same treatments. Among the three macro nutrient, total tuber yield, net return and B:C ratio was lowest for without N followed by Without P and without K application.

**Table 619:** Initial soil fertility status of the experimental plot

Treatments	Soil Texture	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
T1	Clay loam	0.57	7.33	196.00	25.00	414.00
T2		0.67	7.26	212.00	22.80	374.00
T3		0.57	7.16	196.00	26.90	413.00
T4		0.79	7.17	229.00	21.60	474.00
T5		0.72	7.16	218.00	25.10	473.00
T6		0.69	7.10	151.00	24.20	425.00
T7		0.71	7.10	150.00	20.00	415.00

\*OC = Organic Carbon

**Table 620:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha) and concentration in haulm & tuber (%)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
				0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	93.00	40.50	5.75	1.74	3.50	4.96	6.20	16.39	19.20	3.13	1.09
T2	93.00	42.25	7.00	2.08	5.72	7.68	8.59	24.07	19.65	4.73	1.17
T3	93.75	42.75	9.00	2.55	7.26	8.44	8.84	27.08	19.78	5.35	1.45
T4	93.00	36.75	7.00	2.14	3.53	4.47	5.08	15.23	19.33	2.94	1.05
T5	93.50	42.25	7.25	1.66	4.28	5.28	5.58	16.80	18.93	3.17	1.26
T6	93.75	39.75	7.00	1.62	4.55	4.63	6.40	17.19	19.23	3.31	1.45
T7	91.50	31.75	5.00	1.10	3.15	3.24	4.24	11.74	18.58	2.18	1.00
SEd	1.65	1.89	1.19	0.23	0.27	0.46	0.39	0.56	0.27	0.11	0.03
CD(0.05)	NS	4.01	NS	0.50	0.56	0.98	0.82	1.17	0.57	0.23	0.07
CV %	2.51	6.79	24.46	18.02	8.22	11.88	8.51	4.27	1.97	4.37	3.82

Table contd....

Treatments	Concentration in haulm (%)			Concentration in tuber (%)		
	N	P	K	N	P	K
T1	1.66	0.16	0.89	1.63	0.35	1.63
T2	2.33	0.25	1.57	1.81	0.28	1.60
T3	2.18	0.17	1.34	1.93	0.14	1.62
T4	0.96	0.13	1.47	0.53	0.27	1.36
T5	1.50	4.89	1.40	1.74	0.15	1.50
T6	2.21	0.21	1.90	1.74	0.26	1.08
T7	0.77	0.48	0.89	0.50	0.13	1.00
SEd	0.10	2.53	0.08	0.08	0.05	0.05
CD(0.05)	0.22	NS	0.17	0.17	0.10	0.10
CV %	8.76	397.78	8.25	8.04	29.56	4.96

**Table 621:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	16.39	35000	4235	28950	68185	90145	5500	21960	0.32
T2	24.07	35000	8470	28950	72420	132385	5500	59965	0.83
T3	27.08	35000	12705	28950	76655	148940	5500	72285	0.94
T4	15.23	35000	6898	28950	70848	83765	5500	12917	0.18
T5	16.80	35000	4408	28950	68358	92400	5500	24042	0.35
T6	17.19	35000	5634	28950	69584	94545	5500	24961	0.36
T7	11.74	35000	0	27000	62000	64570	5500	2570	0.04

## DEESA

Variety Kufri Badshah produced maximum tuber yield (41.25 t/ha) from treatment of 150 % NPK which was at par with 100% recommended dose of NPK (37.78 t/ha). Nitrogen was the most limiting nutrient and its omission decreases the tuber yield. Omission of P and K, produced 33.74 t/ha and 33.94 t/ha yield respectively, making N as the most limiting nutrient for total yield production. Maximum net return (Rs. 56,000) was from treatment receiving 150 % NPK followed by treatment with 100% recommended dose of NPK (Rs. 50,620).

Recommended dose of N: P: K (kg/ha) : 275:140:275



**Table 622:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)	Tuber yield on dry weight basis (t/ha)
				0-25g	25-50g	50-75g	>75g	Total		
T1	90.37	44.13	3.67	1.00	7.25	12.63	11.42	32.29	19.63	6.33
T2	90.90	50.45	3.94	0.98	7.42	15.38	14.00	37.78	20.77	7.84
T3	90.19	51.93	3.85	1.10	10.44	13.25	16.46	41.25	21.19	8.77
T4	90.64	43.25	2.84	1.01	8.20	11.27	9.16	29.64	19.88	5.88
T5	90.41	51.75	3.72	1.26	9.25	11.61	11.63	33.74	19.79	6.68
T6	90.03	49.98	3.17	1.74	9.19	11.03	11.99	33.94	19.04	6.47
T7	90.05	41.00	2.79	1.17	7.14	11.50	8.23	28.03	19.33	5.42
SEd	0.73	3.60	0.34	0.15	1.08	1.32	1.10	2.30	0.64	0.53
CD(0.05)	NS	7.62	0.71	0.32	2.29	2.80	2.32	4.86	1.35	1.13
CV %	1.15	10.72	13.85	17.87	18.21	15.08	13.08	9.61	4.51	11.13

**Table 623:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	32.29	45000	8500	38500	92000	129160	4000	37160	0.40
T2	37.78	45000	17000	38500	100500	151120	4000	50620	0.50
T3	41.25	45000	25500	38500	109000	165000	4000	56000	0.51
T4	29.64	45000	15525	38500	99025	118560	4000	19535	0.20
T5	33.74	45000	12600	38500	96100	134960	4000	38860	0.40
T6	33.94	45000	14530	38500	98030	135760	4000	37730	0.38
T7	28.03	45000	0	38500	83500	112120	4000	28620	0.34

## DHOLI

Significantly highest tuber yield (26.25 t/ha) was recorded with 150 % recommended dose of NPK in variety Kufri Ashoka. 50% RDF of NPK and without NPK treatments recorded significantly lower yield of 14.13 t/ha and 12.21 t/ha and respectively. Similar trend was observed for net return and B:C values.

Recommended dose of N: P: K (kg/ha) : 150:80:100

**Table 624:** Initial Soil fertility status of the experimental plot

Soil texture	OC*	pH	Av N (kg/ha)	Av P (kg/ha)	Av K (kg/ha)
Sandy loam Calciorthent	0.41	8.40	196.00	16.70	98.30

\*OC = Organic Carbon

**Table 625:** Plant emergence (%), morphological traits and grade-wise tuber yield (t/ha).

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)				
				0-25g	25-50g	50-75g	>75g	Total
T1	94.70	33.32	3.78	3.51	4.63	2.99	2.99	14.13
T2	96.73	42.97	5.20	3.46	7.20	5.37	6.16	22.26
T3	97.77	49.02	6.67	4.29	8.53	6.60	7.62	26.25
T4	93.90	36.38	4.61	3.07	3.01	2.84	6.06	14.21
T5	95.02	40.98	4.81	3.15	4.98	3.38	6.95	14.98
T6	95.45	40.93	4.17	3.46	5.31	4.00	4.00	16.76
T7	94.09	29.74	3.92	2.86	3.19	3.28	2.88	12.21
SEd	1.67	2.80	0.41	0.58	0.53	0.62	0.56	1.25
CD(0.05)	NS	5.93	0.88	NS	1.12	1.30	1.19	2.64
CV%	2.48	10.14	12.36	23.93	14.27	21.39	15.12	10.23

**Table 626: Economics**

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	14.13	30000	7220	36000	73220	113040	8000	39820	0.54
T2	22.26	30000	12620	36000	78620	178080	8000	99460	1.27
T3	26.25	30000	16780	36000	82780	210000	8000	127220	1.54
T4	14.21	30000	7460	36000	73460	113680	8000	40220	0.55
T5	14.98	30000	6500	36000	72500	119840	8000	47340	0.65
T6	16.76	30000	5100	36000	71100	134080	8000	62980	0.89
T7	12.21	30000	0	36000	66000	97680	8000	31680	0.48

**GWALIOR**

Highest tuber yield of 35.61 t/ha was obtained with 150 % RDF of NPK followed by 35.24 t/ha under only NP (without K) application in variety Kufri Jyoti. Highest net return was obtained in treatment without P application (Rs. 1, 31,417).

Recommended dose of N: P: K (kg/ha) : 180:80:120

**Table 627: Initial soil fertility status of the experimental plot**

Soil Texture	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)	Av Cu	Av Zn	Av Fe
Silty clay loam	0.25	7.1	148	30.6	155.5	0.9	0.94	17.06

\*OC = Organic Carbon

**Table 628: Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber yield on dry weight basis (t/ha)**

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
				0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	100.00	44.53	4.20	2.00	3.32	5.46	21.58	32.35	20.30	6.56	2.48
T2	97.50	49.88	3.48	1.82	3.36	6.31	23.03	34.51	21.46	7.42	2.37
T3	98.33	47.88	4.13	2.37	4.05	6.32	22.86	35.61	18.17	6.47	2.99
T4	99.18	47.53	3.68	1.86	3.41	6.42	19.24	30.92	18.82	5.83	2.09
T5	99.18	46.33	4.20	2.00	2.82	6.24	23.10	34.15	19.75	6.75	2.80
T6	100.00	48.88	3.88	1.78	3.27	6.11	24.08	35.24	17.31	6.10	2.48
T7	100.00	49.80	4.48	1.55	2.78	6.36	20.58	31.28	18.87	5.90	1.64
SEd	0.82	1.96	0.30	0.15	0.10	0.19	0.30	0.34	2.38	0.77	0.35
CD(0.05)	1.74	NS	NS	0.32	0.20	0.40	0.63	0.72	NS	NS	0.75
CV%	1.17	5.79	10.75	11.14	4.07	4.33	1.90	1.44	17.49	16.93	20.83

**Table 629: Economics**

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	32.35	35000	4036	29800	68836	189248	5850	120412	1.75
T2	34.51	35000	8066	29800	72866	201884	5850	129018	1.77
T3	35.61	35000	12102	29800	76902	208319	5850	131417	1.71
T4	30.92	35000	5600	29800	70400	180882	5850	110482	1.57
T5	34.15	35000	4238	29800	69038	199778	5850	130740	1.89
T6	35.24	35000	5766	29800	70566	206154	5850	135588	1.92
T7	31.28	35000	0	29800	64800	182988	5850	118188	1.82

## HISAR

The maximum tuber yield (22.51 t/ha) was recorded with 150 % recommended dose of NPK which was at par with treatment receiving 100% of the recommended dose of NPK and without K in variety Kufri Bahar. Treatment without NPK application gave lowest yield (25.59 t/ha). The net return and B:C ratio followed the same trend.

Recommended dose of N: P: K (kg/ha) : 150:50:100

**Table 630:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
				0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	95.25	57.58	4.43	2.92	7.30	6.78	14.96	31.96	18.80	6.43	1.72
T2	96.00	62.25	4.80	3.61	7.79	8.29	19.14	38.83	19.26	7.92	2.42
T3	95.85	63.50	5.23	2.69	8.47	8.40	19.96	39.52	19.06	7.97	2.76
T4	95.55	54.28	4.40	1.65	8.07	7.23	16.83	33.78	19.05	7.02	1.87
T5	96.50	57.33	4.45	1.03	8.46	7.35	18.06	34.89	18.68	7.13	1.84
T6	95.98	58.05	4.55	1.81	9.48	7.66	18.23	37.18	18.54	7.33	1.80
T7	95.10	49.85	3.93	1.86	6.57	5.20	11.96	25.59	17.02	4.74	0.12
SEd	1.68	1.87	0.32	0.34	0.35	0.40	0.86	1.10	0.56	0.24	0.19
CD(0.05)	NS	3.95	0.67	0.73	0.74	0.84	1.82	2.33	1.19	0.50	0.41
CV%	2.49	4.59	9.84	21.88	6.19	7.72	7.15	4.51	4.25	4.80	15.31

**Table 631:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	31.96	25000	3323	42199	70522	191760	6000	121238	1.72
T2	38.83	25000	6645	42199	73844	232980	6000	159136	2.16
T3	39.52	25000	9968	42199	77167	237120	6000	159953	2.07
T4	33.78	25000	4770	42199	71969	202680	6000	130711	1.82
T5	34.89	25000	4458	42199	71657	209340	6000	137683	1.92
T6	37.18	25000	4813	42199	72012	223080	6000	151068	2.10
T7	25.59	25000	0	42199	67199	153540	6000	86341	1.28

## JALANDHAR

At Jalandhar for variety Kufri Jyoti, 100% recommended dose of NPK recorded highest yield (25.07 t/ha), which was at par with 50% and 150% recommended NPK dose application. Without NPK and without N treatments produced significantly low yields (17.04 t/ha and 17.44 t/ha respectively) revealing that, nitrogen was the most yield limiting nutrient.

Recommended dose of N: P: K (kg/ha) : 240:100:150

**Table 632:** Plant emergence (%), morphological traits and grade-wise tuber yield (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)				
				0-25g	25-50g	50-75g	>75g	Total
T1	97.25	58.70	4.20	3.79	4.69	4.82	9.98	23.27
T2	97.50	55.00	4.20	3.49	5.24	5.05	11.29	25.07
T3	97.50	54.95	4.25	3.87	5.00	5.08	9.99	23.94
T4	97.75	44.35	3.90	3.52	4.34	4.20	5.38	17.44
T5	97.50	47.90	4.20	3.65	4.67	4.72	9.09	22.12

T6	98.25	47.40	3.80	3.42	3.91	3.99	10.86	22.17
T7	98.25	51.85	4.00	3.84	3.70	3.49	6.02	17.04
SEd	1.36	1.59	0.30	0.32	0.39	0.39	0.91	1.16
CD(0.05)	NS	3.37	NS	NS	0.83	0.82	1.92	2.45
CV%	1.97	4.38	10.39	12.49	12.34	12.26	14.33	7.58

**Table 633:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	23.27	35000	5325	68000	108325	93080	4000	-15245	-0.14
T2	25.07	35000	10650	68000	113650	100280	4000	-13370	-0.12
T3	23.94	35000	15975	68000	118975	95760	4000	-23215	-0.20
T4	17.44	35000	7531	68000	110531	69760	4000	-40771	-0.37
T5	22.12	35000	7370	68000	110370	88480	4000	-21890	-0.20
T6	22.17	35000	6401	68000	109401	88680	4000	-20721	-0.19
T7	17.04	35000	0	68000	103000	68160	4000	-34840	-0.34

### KALYANI

Variety Kufri Jyoti showed Significant increase in yield with 150% recommended NPK doses (31.59 t/ha) compared to 100% RDF (28.49 t/ha). Control treatment (without NPK) and without N treatments produced significantly lower yield and resulted in monetary losses. Highest net return (Rs. 85,619) and B:C ratio (0.82) as obtained from treatment 150% recommended NPK followed by treatment receiving 100 % recommended NPK (Rs. 74,326 net return and 0.77 B:C ratio).

**Table 634:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Yield on dry weight basis (t/ha)	
				0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	100.00	40.75	3.23	2.97	4.24	5.77	6.40	19.36	3.77	3.70
T2	98.83	55.75	3.85	4.40	5.83	8.70	9.57	28.49	5.53	5.10
T3	99.80	60.25	4.00	5.50	6.57	9.20	10.33	31.59	6.17	5.20
T4	99.75	34.25	2.48	1.77	3.97	5.33	2.07	13.13	2.57	2.04
T5	98.98	50.75	3.58	3.10	5.00	6.90	2.37	17.37	3.37	2.87
T6	99.15	55.50	3.70	4.77	5.33	9.00	6.83	25.93	5.07	4.30
T7	99.63	30.25	2.13	1.63	3.24	4.33	1.00	10.20	1.97	1.60
SEd	0.46	2.17	0.17	0.34	0.33	0.43	0.46	0.80	0.17	0.23
CD(0.05)	NS	4.58	0.36	0.71	0.69	0.90	0.98	1.70	0.36	0.48
CV%	0.65	6.55	7.39	13.83	9.46	8.57	11.88	5.44	5.89	9.05

**Table 635:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	19.36	32000	7307	50000	89307	116160	6000	26853	0.30
T2	28.49	32000	14614	50000	96614	170940	6000	74326	0.77
T3	31.59	32000	21921	50000	103921	189540	6000	85619	0.82
T4	13.13	32000	12004	50000	94004	78780	6000	-15224	-0.16
T5	17.37	32000	7110	50000	89110	104220	6000	15110	0.17
T6	25.93	32000	10114	50000	92114	155580	6000	63466	0.69
T7	10.20	32000	0	50000	82000	61200	6000	-20800	-0.25

## KOTA

Variety Kufri Pushkar produced maximum tuber yield with application of 150% RDF of NPK (22.71 t/ha) which was at par with application of 100 % RDF of NPK (21.52 t/ha). Treatment with 50% RDF of NPK application resulted in maximum dry matter content of 21.93 %. Treatment 150 % RDF of NPK gave maximum net return of Rs. 55,670 followed by 100% RDF of NPK (Rs. 52,455). The B:C ratio followed the same trend.

Recommended dose of N: P: K (kg/ha) : 187.5:125:125

**Table 636:** Initial Soil fertility status of the experimental plot

Soil texture	OC*	pH	Av N (kg/ha)	Av P (kg/ha)	Av K (kg/ha)
Clay loam	0.34	7.5	315	12.7	351

\*OC = Organic Carbon

**Table 637:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)	Tuber yield on dry weight basis (t/ha)
				0-25g	25-50g	50-75g	>75g	Total		
T1	92.16	37.60	2.90	5.52	5.71	5.35	3.19	19.71	23.45	4.63
T2	94.05	45.48	5.03	4.57	5.83	6.38	4.74	21.52	21.10	4.54
T3	95.10	53.33	5.30	4.31	6.54	6.87	5.00	22.71	20.38	4.63
T4	91.24	30.68	3.45	5.05	5.28	5.05	2.29	17.66	21.93	3.88
T5	92.70	34.25	4.30	4.43	5.62	4.89	2.93	17.87	21.90	3.92
T6	95.10	33.48	4.10	3.94	5.23	4.58	2.50	16.26	20.43	3.33
T7	89.69	29.90	3.23	5.52	2.73	2.55	2.03	12.91	20.78	2.71
SEd	0.88	1.48	0.33	0.42	0.28	0.35	0.53	0.81	0.25	0.20
CD(0.05)	1.87	3.13	0.70	0.89	0.58	0.73	1.13	1.72	0.53	0.43
CV %	1.34	5.53	11.50	12.55	7.36	9.57	23.23	6.25	1.65	7.26

**Table 638:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	19.71	20000	2735	29675	52410	98550	5000	46140	0.88
T2	21.52	20000	5470	29675	55145	107600	5000	52455	0.95
T3	22.71	20000	8205	29675	57880	113550	5000	55670	0.96
T4	17.66	20000	3458	29675	53133	88300	5000	35167	0.66
T5	17.87	20000	2970	29675	52645	89350	5000	36705	0.70
T6	16.26	20000	4511	29675	54186	81300	5000	27114	0.50
T7	12.91	20000	0	29675	49675	64550	5000	14875	0.30

## PANTNAGAR

Kufri Surya produced significantly highest tuber yield of 36.26 t/ha with application of 100% RDF of NPK followed by 150% RDF of NPK (34.66 t/ha). Highest dry matter of 22.36% was obtained without N application, but yield was significantly lower. Maximum net return was achieved from 100 % RDF (Rs. 1, 87,021) followed by with 150 % RDF (Rs. 1, 67,868).

**Table 639:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
				0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	98.33	60.22	4.00	1.77	13.12	8.75	8.49	32.14	21.48	6.50	2.18
T2	98.33	68.78	4.55	1.80	13.95	10.68	9.83	36.26	20.55	6.21	2.49
T3	96.67	75.89	4.33	1.75	13.67	10.24	9.00	34.66	19.50	5.90	1.85
T4	99.17	64.11	5.11	1.29	10.55	6.36	4.37	22.57	22.36	6.77	1.16
T5	98.06	67.89	4.78	1.65	12.35	7.10	6.95	28.05	21.58	6.53	2.04
T6	97.78	67.44	4.67	1.70	13.15	8.52	7.72	31.09	21.73	6.57	2.01
T7	98.61	59.00	3.89	1.11	5.74	3.58	2.73	13.15	21.44	6.49	1.53
SEd	0.86	0.75	0.22	0.12	0.41	0.36	0.39	0.70	1.57	0.48	0.20
CD(0.05)	NS	1.65	0.49	0.26	0.90	0.78	0.87	1.53	NS	NS	0.45
CV%	1.08	1.39	6.14	9.20	4.24	5.51	6.88	3.02	9.04	9.07	13.14

**Table 640:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	32.14	80000	4753.5	81872	166626	321400	10000	154775	0.93
T2	36.26	80000	9507	86072	175579	362600	10000	187021	1.07
T3	34.66	80000	14260.5	84472	178733	346600	10000	167868	0.94
T4	22.57	80000	7390	72272	159662	225700	10000	66038	0.41
T5	28.05	80000	4507	77772	162279	280500	10000	118221	0.73
T6	31.09	80000	7117	80772	167889	310900	10000	143011	0.85
T7	13.15	80000	0	62872	142872	131500	10000	-11372	-0.08

## PASIGHAT

Maximum potato tuber yield of Kufri Jyoti was obtained with the application of 100% RDF of NPK (32.04 t/ha) which was at par with without any application of P (30.30 t/ha) and 150% RDF of NPK (29.91 t/ha).

**Table 641:** Initial soil fertility status of the experimental plot.

Treatments	Soil texture	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
T1	Loamy sand	2.10	6.75	373.50	38.70	184.50
T2		2.00	6.72	373.00	38.50	184.50
T3		2.00	6.72	373.50	38.50	184.00
T4		2.10	6.70	373.50	38.70	184.80
T5		2.10	6.74	373.50	38.70	184.50
T6		2.10	6.70	373.00	38.70	184.50
T7		2.00	6.72	372.00	38.70	184.00

\*= Organic carbon content of soil.

**Table 642:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha) and dry matter content (%)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)
				0-25g	25-50g	50-75g	>75g	Total	
T1	87.78	20.44	2.81	8.35	9.07	6.10	1.84	25.36	19.26
T2	90.56	21.27	3.38	7.44	12.74	9.43	2.43	32.04	23.41
T3	88.06	21.95	3.48	7.14	9.74	10.89	2.15	29.91	22.77
T4	86.67	18.56	3.13	7.42	11.90	5.93	2.24	27.48	20.56
T5	90.55	21.02	3.43	6.84	12.97	8.75	1.74	30.30	21.68
T6	87.78	20.99	3.28	8.76	9.99	8.26	1.94	28.95	23.93
T7	87.50	13.30	3.18	8.70	6.76	1.41	0.62	17.48	23.26

SEd	1.36	0.79	0.09	0.35	0.60	0.34	0.17	0.76	0.65
CD(0.05)	NS	1.68	0.20	0.74	1.27	0.73	0.37	1.61	1.37
CV%	2.18	5.71	4.09	6.36	8.10	6.72	13.19	3.93	4.14

#### PATNA

Maximum tuber yield of Kufri Khyati was recorded in treatment 150% RDF of NPK (28.57 t/ha) which was at par with without K treatment and 100 % RDF of NPK treatments.

Recommended dose of N: P: K (kg/ha) : 150:60:80

**Table 643:** Plant emergence (%), morphological traits and grade-wise tuber yield (t/ha).

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)				
				0-25g	25-50g	50-75g	>75g	Total
T1	95.25	45.55	2.43	3.11	4.01	7.45	6.09	20.65
T2	94.50	41.03	2.58	2.01	4.28	7.95	10.56	24.80
T3	96.25	46.23	2.43	2.64	5.16	9.59	11.18	28.57
T4	96.25	44.38	2.48	2.76	4.05	7.52	4.15	18.48
T5	96.00	45.25	2.75	2.13	4.08	7.58	8.87	22.66
T6	95.75	33.15	2.48	2.41	4.97	9.22	8.68	25.28
T7	95.75	41.65	2.35	2.41	3.32	6.17	4.49	16.39
SEd	0.79	8.46	0.19	0.41	0.37	0.69	1.54	1.67
CD(0.05)	NS	NS	NS	NS	0.78	1.45	3.25	3.54
CV%	1.17	28.16	10.79	23.48	12.23	12.23	28.16	10.55

#### PUNE

Treatment with 100% RDF of NPK recorded highest tuber yield of variety kufri Surya ( 17.33 t/ha) which was at par with treatment with 150 % RDF of NPK (16.27 t/ha). Maximum net return of Rs. 1,00,325 and B:C ratio of 1.37 was recorded from treatment with 100 % RDF of NPK followed by 150 % RDF of NPK (Rs. 87,238 net return and 1.16 B:C ratio).

Recommended dose of N: P: K (kg/ha) : 150:80:100

**Table 644:** Initial soil fertility status of the experimental plot

Treatments	Soil Texture	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
T1	Light Black	0.7	7.2	186.0	31.0	362.0
T2		0.7	7.4	188.0	32.0	361.0
T3		0.7	7.2	184.0	32.0	361.0
T4		0.7	7.2	183.0	32.0	360.0
T5		0.7	7.3	182.0	33.5	362.0
T6		0.7	7.3	186.0	33.0	361.0
T7		0.7	7.2	184.0	32.0	360.0

\*OC = Organic Carbon

**Table 645:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha), concentration of NPK in haulm & tuber (%), nutrient NPK uptake by potato haulm & tuber (kg/ha) and total uptake by potato crop (kg/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
				0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	89.19	43.50	2.35	0.28	1.31	10.10	0.62	12.31	17.55	3.24	2.03
T2	91.07	47.75	3.33	0.38	1.76	11.30	3.89	17.33	18.13	3.82	2.24
T3	88.40	50.88	3.35	0.45	1.98	11.71	2.14	16.27	18.98	4.19	2.37
T4	88.55	39.50	2.10	0.24	1.10	10.07	0.33	11.75	19.66	2.57	1.68
T5	89.85	42.23	2.09	0.27	1.79	9.65	0.37	12.09	16.95	2.68	1.77

T6	88.81	42.88	2.15	0.31	1.83	9.40	0.34	11.88	17.15	2.62	1.74
T7	87.94	37.25	2.06	0.18	0.49	8.04	0.06	8.76	18.53	2.39	1.29
SEd	1.37	0.78	0.08	0.04	0.15	0.47	0.19	0.56	0.67	0.06	0.04
CD(0.05)	NS	1.65	0.16	0.08	0.32	0.99	0.41	1.19	1.41	0.12	0.07
CV%	2.17	2.54	4.33	17.06	14.63	6.57	24.88	6.15	5.21	2.51	2.63

Table contd.....

Treatments	Concentration of nutrient in haulm (%)			Concentration of nutrient in tuber (%)		
	N	P	K	N	P	K
T1	2.76	1.71	2.25	2.73	1.59	1.90
T2	2.76	1.69	2.61	3.19	1.79	1.61
T3	2.73	1.93	2.99	2.91	2.05	1.71
T4	2.51	1.78	2.46	2.90	1.93	2.03
T5	3.44	1.13	2.04	2.76	1.73	1.80
T6	3.43	1.64	1.84	2.87	1.76	1.98
T7	2.01	0.76	1.33	2.41	1.33	1.60
SEd	0.28	0.16	0.12	0.17	0.19	0.06
CD(0.05)	0.59	0.33	0.26	0.37	0.39	0.13
CV%	13.94	14.41	7.85	8.70	15.09	4.88

Table contd.....

Treatments	Nutrient uptake by potato haulm (kg/ha)			Nutrient uptake by potato tuber (kg/ha)			Total uptake (kg/ha)		
	N	P	K	N	P	K	N	P	K
T1	27.78	17.00	22.51	47.50	27.61	30.86	75.28	44.61	53.37
T2	19.09	17.04	26.30	55.55	31.54	28.00	74.64	48.58	54.30
T3	22.28	15.40	23.60	52.24	34.87	30.89	74.52	50.27	54.49
T4	21.90	15.08	21.25	48.13	30.93	32.77	70.02	46.00	54.02
T5	32.48	10.53	20.17	45.98	28.52	29.76	78.46	39.04	49.92
T6	28.93	15.50	18.34	44.91	26.46	31.17	73.84	41.96	49.51
T7	15.91	6.35	11.41	32.71	18.21	21.38	48.62	24.56	32.79
SEd	0.58	0.59	0.77	0.72	0.35	0.46	0.73	0.74	0.84
CD(0.05)	1.24	1.25	1.63	1.52	0.74	0.98	1.55	1.57	1.77
CV%	3.43	6.04	5.31	2.17	1.74	2.23	1.46	2.49	2.38

**Table 646:** Soil properties: N, P, K, removal (kg/ha) by the crop

Treatments	Nutrients applied (kg/ha)			Nutrients removed (kg/ha)			Available status of soil after harvesting (kg/ha)		
	N	P	K	N	P	K	Av. N	Av. P	Av. K
T1	75	30	60	122.0	6.7	42.0	154.0	22.0	306.0
T2	150	60	120	167.0	8.1	52.0	168.0	26.0	322.0
T3	225	90	180	188.0	5.3	54.0	154.0	29.0	345.0
T4	0	60	120	87.0	3.8	26.0	145.0	27.0	330.0
T5	150	0	120	11.0	4.2	40.0	150.0	19.0	320.0
T6	150	60	0	160.0	5.6	37.0	155.0	25.0	285.0
T7	0	0	0	95.0	4.1	31.0	126.0	21.0	280.0

**Table 647:** Soil properties: Effect on soil fertility

Treatments	Nutrient balance (kg/ha)*			Soil fertility after the complete sequence (kg/ha)			Change in soil fertility (kg/ha)**		
	N	P	K	N	P	K	Av. N	Av. P	Av. K
T1	-47.0	23.3	18.0	156.0	21.0	306.0	-30.0	-10.0	-56.0
T2	-17.0	51.9	68.0	168.0	28.0	318.0	-20.0	-4.0	-43.0
T3	37.0	84.7	126.0	154.0	30.0	351.0	-30.0	-2.0	-10.0
T4	-87.0	56.2	94.0	148.0	32.0	335.0	-35.0	0.0	-25.0
T5	139.0	-4.2	80.0	153.0	19.0	325.0	-29.0	-14.5	-37.0
T6	-10.0	54.4	-37.0	159.0	26.0	295.0	-27.0	-7.0	-66.0
T7	-95.0	-4.1	-31.0	125.0	24.0	285.0	-59.0	-8.0	-75.0

Av= Available

\* Nutrient balance = Total nutrient applied - Total nutrient removed

\*\* Change in soil fertility = soil fertility after the complete sequence - initial soil fertility



**Table 648:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	12.31	30000	2487	38000	70487	123100	10000	52613	0.75
T2	17.33	30000	4975	38000	72975	173300	10000	100325	1.37
T3	16.27	30000	7462	38000	75462	162700	10000	87238	1.16
T4	11.75	30000	3142	38000	71142	117500	10000	46358	0.65
T5	12.09	30000	3532	38000	71532	120900	10000	49368	0.69
T6	11.88	30000	3294	38000	71294	118800	10000	47506	0.67
T7	8.76	30000	0	38000	68000	87600	10000	19600	0.29

**RAIPUR**

Maximum tuber yield was obtained in with application of 150% RDF with NPK (26.07 t/ha) followed by treatment 100 % RDF in NPK (20.13 t/ha). Lowest yield (10.64 t/ha) was recorded without NPK application. Similar trend was observed for net return and B:C ratio. Maximum net return was from treatment 150% RDF of NPK (Rs. 1,78,177) followed by 100% RDF of NPK (Rs. 1,23,354). B:C ratio followed the same trend.

**Table 649:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
				0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	81.17	32.12	3.87	3.76	2.32	1.64	2.01	13.20	18.10	2.40	7.21
T2	82.41	35.94	5.07	7.05	4.89	2.52	3.35	20.13	20.03	4.04	8.75
T3	81.17	39.48	6.00	7.20	4.74	4.38	4.22	26.07	20.37	5.33	11.67
T4	80.87	28.20	3.60	4.09	2.80	1.70	0.90	14.71	19.00	2.81	7.09
T5	81.79	30.45	4.00	5.56	3.34	1.93	1.54	17.26	19.10	3.29	7.33
T6	79.94	35.21	3.67	6.25	4.29	2.73	2.16	18.16	19.00	3.42	9.27
T7	83.33	24.49	3.40	3.14	2.57	1.13	1.03	10.64	17.30	1.83	4.58
SEd	1.60	2.47	0.33	2.65	1.85	0.78	0.22	4.82	0.39	0.97	0.60
CD(0.05)	NS	5.45	0.73	NS	NS	1.72	0.49	NS	0.85	NS	1.31
CV%	2.40	9.39	9.57	61.24	63.38	41.80	12.56	34.35	2.49	36.03	9.14

**Table 650:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	13.20	40000	4577	28792	73369	132000	10000	58631	0.80
T2	20.13	40000	9154	28792	77946	201300	10000	123354	1.58
T3	26.07	40000	13731	28792	82523	260700	10000	178177	2.16
T4	14.71	40000	7302	28792	76094	147100	10000	71006	0.93
T5	17.26	40000	4792	28792	73584	172600	10000	99016	1.35
T6	18.16	40000	6214	28792	75006	181600	10000	106594	1.42
T7	10.64	40000	0	28792	68792	106400	10000	37608	0.55

#### AGRON.4: OPTIMIZING PHOSPHORUS REQUIREMENTS OF POTATO UNDER CURRENT SCENARIO OF P USE BY THE FARMERS.

The trial was conducted at Dholi, Faizabad, Jalandhar, Kalyani and Pantnagar.

**Table 651:** Experimental and treatments details at different locations.

Center	Year	Design	Rep	Gross plot size (m <sup>2</sup> )	Net plot size (m <sup>2</sup> )	Variety	Spacing (cm)	Date of Planting	Date of Haulm cutting	Date of Harvesting
DHL	2016-17	RBD	4	19.20	12.96		60X20	16.11.16	28.02.17	20.03.17
FZB	2016-17	RBD	4	14.28	9.00	K Khyati	60X20	17.11.16		27.02.17
JAL	2016-17	RBD	4	22.88	15.60	K Pukhraj	65x20	26.10.16	15.01.17	28.02.17
KAN	2016-17	RBD	4	9.00	4.68	K Bahar	60X20	25.10.16	25.02.17	10.03.17
PNT	2016-17	RBD	3	16.80	12.96	K Surya	60X20	24.10.16	12.02.17	24.02.17

#### Treatments

- T1 : Farmer's practice (to be explained)  
T2 : Zero P ( control)  
T3 : 30 kg P<sub>2</sub>O<sub>5</sub>/ha  
T4 : 60 kg P<sub>2</sub>O<sub>5</sub>/ha  
T5 : 90 kg P<sub>2</sub>O<sub>5</sub>/ha  
T6 : 120 kg P<sub>2</sub>O<sub>5</sub>/ha  
T7 : Recommended dose of the region

#### **DHOLI**

Application of recommended dose of phosphorous at Dholi conditions produced maximum tuber yield of 26.52 t/ha which was at par with treatment of 90 Kg P<sub>2</sub>O<sub>5</sub>/ ha phosphorous application (26.25 t/ha). It indicated that, in Dholi conditions, recommended dose of P (90 Kg P<sub>2</sub>O<sub>5</sub>/ ha) produced optimum yield. Maximum net return of Rs. 1,35,030 and 1.75 B:C ratio was achieved from recommended dose of Phosphorous application.

Recommended dose of N: P: K (kg/ha) : 150 : 90 : 100

Recommended dose of the farmers N: P: K (kg/ha) : 200 : 50 : 50

**Table 652:** Initial soil fertility status of the experimental plot

Soil texture	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
Sandy loam	8.1	209	17.5	110.4

**Table 653:** Plant emergence (%), grade-wise and total yield (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)				
		0-25g	25-50g	50-75g	>75g	Total
T1	98.13	2.78	3.38	5.87	5.99	18.01
T2	98.45	2.28	4.59	3.86	3.69	14.42
T3	97.55	2.49	3.15	6.29	6.43	18.37
T4	97.55	2.34	4.81	5.77	7.09	20.00
T5	97.75	2.53	5.04	6.97	9.52	24.05
T6	98.60	2.80	6.01	7.49	9.96	26.25
T7	98.18	2.94	5.97	7.43	10.19	26.52
SEd	0.97	0.21	0.40	0.70	0.46	1.07
CD(0.05)	NS	0.44	0.85	1.48	0.98	2.26
CV%	1.40	11.26	12.07	15.83	8.64	7.17

**Table 654: Economics**

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	18.01	30000	11640	36000	77640	144080	8000	66440	0.86
T2	14.42	30000	8630	36000	74630	115360	8000	40730	0.55
T3	18.37	30000	9130	36000	75130	146960	8000	71830	0.96
T4	20.00	30000	10630	36000	76630	160000	8000	83370	1.09
T5	24.05	30000	11130	36000	77130	192400	8000	115270	1.49
T6	26.25	30000	12630	36000	78630	210000	8000	131370	1.67
T7	26.52	30000	11130	36000	77130	212160	8000	135030	1.75

**FAIZABAD**

For variety Kufri Khyati, application of 120 Kg P<sub>2</sub>O<sub>5</sub>/ ha produced maximum yield of 36.89 t/ha which was at par with application of recommended dose of P application (36.31 t/ha). Maximum NPK uptake by the tubers was with the application of 120 Kg P<sub>2</sub>O<sub>5</sub>/ ha. Highest net return per hectare (Rs. 1,26,673) and B:C ratio (2.19) obtained from application of 120 Kg P<sub>2</sub>O<sub>5</sub>/ ha.

Recommended dose of N: P: K (kg/ha) : 150 : 100 : 120

Recommended dose of the farmers DAP: Urea: MOP (kg/ha) : 250: 100: 150

**Table 655: Initial soil fertility status of the experimental plot**

Treatments	Soil Texture	EC	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
T1	Clay loam	0.32	0.34	8.15	140.00	14.50	225.00
T2		0.32	0.34	8.15	140.00	14.50	225.00
T3		0.32	0.34	8.15	140.00	14.50	225.00
T4		0.32	0.34	8.15	140.00	14.50	225.00
T5		0.32	0.34	8.15	140.00	14.50	225.00
T6		0.32	0.34	8.15	140.00	14.50	225.00
T7		0.32	0.34	8.15	140.00	14.50	225.00

\*OC = Organic Carbon

**Table 656: Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and haulm yield on dry weight basis (t/ha)**

Treatment	Emergence (%)	Grade-wise yield of tubers (t/ha)					Grade-wise number of tubers (no/ha)				
		0-25g	25-50g	50-75g	>75g	Total	0-25g	25-50g	50-75g	>75g	Total
T1	94.29	1.81	7.56	10.58	10.28	30.22	120556	198333	170556	111389	600834
T2	95.00	1.35	5.61	8.15	7.38	22.50	90000	147500	131111	80000	448611
T3	95.71	1.60	6.65	9.31	9.05	26.61	106389	175000	149722	98055	529167
T4	95.71	1.90	7.94	11.11	10.82	31.77	126667	208611	179167	117500	631945
T5	96.43	2.04	8.56	11.99	11.64	34.22	135833	224722	192778	126111	679444
T6	95.71	2.18	9.21	12.90	12.60	36.89	145278	242222	207778	136945	732222
T7	96.43	2.18	9.07	12.71	12.35	36.31	145000	238333	204722	134167	722222
SEd	1.00	0.08	0.34	0.51	0.48	1.35	5427	8837	8129	5175	26718
CD(0.05)	NS	0.17	0.71	1.07	1.02	2.86	11489	18711	17211	10956	56568
CV%	1.48	6.18	6.08	6.53	6.41	6.12	6.18	6.10	6.51	6.37	6.09

Table contd.....

Treatment	Dry matter content (%)	NPK composition (%)			NPK uptake by tuber (kg/ha)		
		N	P	K	N	P	K
T1	17.71	2.68	0.88	2.22	143.46	33.06	118.97
T2	17.54	2.51	0.75	2.09	98.85	20.72	82.47
T3	17.93	2.56	0.79	2.12	121.92	26.46	101.15
T4	18.08	2.60	0.83	2.16	149.33	33.45	123.92
T5	18.24	2.64	0.87	2.19	164.60	37.79	136.67
T6	17.99	2.72	0.92	2.26	180.72	42.75	150.03

T7	17.98	2.77	0.90	2.30	180.75	41.10	149.89
SEd	0.06	0.03	0.00	0.03	7.14	1.42	5.86
CD(0.05)	0.12	0.07	0.01	0.06	15.11	3.01	12.41
CV%	0.45	1.84	0.70	1.78	6.80	5.99	6.72

**Table 657:** Soil fertility status of the experimental plot before experiment

Treatments	Soil Texture	EC	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
T1	Clay loam	0.31	0.35	8.10	12.10	14.60	227.50
T2		0.33	0.33	8.15	12.15	14.40	222.60
T3		0.32	0.34	8.10	12.10	14.40	225.50
T4		0.31	0.35	8.10	12.10	14.60	226.00
T5		0.31	0.35	8.10	12.10	14.65	227.00
T6		0.31	0.35	8.10	12.10	14.70	228.00
T7		0.31	0.35	8.10	12.10	14.70	228.00

\*OC = Organic Carbon

**Table 658:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	30.22	21000	10420	25000	56420	151100	5000	94680	1.68
T2	22.50	21000	6164	25000	52164	112500	5000	60336	1.16
T3	26.61	21000	7573	25000	53573	133050	5000	79477	1.48
T4	31.77	21000	8975	25000	54975	158850	5000	103875	1.89
T5	34.22	21000	10376	25000	56376	171100	5000	114724	2.03
T6	36.89	21000	11777	25000	57777	184450	5000	126673	2.19
T7	36.31	21000	11777	25000	57777	181550	5000	123773	2.14

## JALANDHAR

Maximum tuber yield of Variety Kufri Pukhraj (30.61 t/ha) was produced from recommended dose of Phosphorous application which was at par with of 90 Kg P<sub>2</sub>O<sub>5</sub>/ ha phosphorous application (29.21 t/ha). It indicated that at Jalandhar recommended dose of Phosphorous application @ 100 Kg P<sub>2</sub>O<sub>5</sub>/ ha was optimum. Maximum net return per hectare was recorded from treatment of phosphorous application from farmer's practice.

Recommended dose of N: P: K (kg/ha) : 240 : 100 : 150

Recommended dose of the farmers Urea: DOP: MOP (kg/ha) : 500 : 375 : 250

**Table 659:** Plant emergence (%) and grade-wise yield (t/ha) & number of tubers (no/ha)

Treatment	Emergence (%)	Grade-wise yield of tubers (t/ha)					Grade-wise number of tubers (no/ha)				
		0-25g	25-50g	50-75g	>75g	Total	0-25g	25-50g	50-75g	>75g	Total
T1	85.00	2.71	4.20	5.42	13.54	25.87	127725	93269	100801	118590	440385
T2	85.75	2.93	4.39	6.35	14.18	27.85	138301	99039	113622	124359	475321
T3	84.50	2.36	3.69	5.09	11.78	22.92	123238	90705	96154	115225	425321
T4	89.00	2.92	4.52	5.77	14.58	27.79	137821	98237	100641	127244	463943
T5	85.75	3.06	4.73	6.12	15.30	29.21	143109	101923	110577	132052	487661
T6	85.00	2.74	4.58	5.88	14.19	27.39	139583	95352	105770	126763	467468
T7	86.25	3.19	5.10	6.38	15.95	30.61	139103	102084	112981	128045	482212
SEd	3.52	0.29	0.36	0.62	1.34	2.53	6964	5928	8793	5044	24206
CD(0.05)	NS	NS	0.75	NS	NS	NS	NS	NS	NS	NS	NS
CV%	5.79	14.27	11.30	15.00	13.29	13.07	7.27	8.62	11.75	5.73	7.39

**Table 660:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	25.87	35000	16625	68000	119625	103480	4000	-16145	-0.13
T2	27.85	35000	6875	68000	109875	111400	4000	1525	0.01
T3	22.92	35000	8850	68000	111850	91680	4000	-20170	-0.18
T4	27.79	35000	10325	68000	113325	111160	4000	-2165	-0.02
T5	29.21	35000	11800	68000	114800	116840	4000	2040	0.02
T6	27.39	35000	13295	68000	116295	109560	4000	-6735	-0.06
T7	30.61	35000	12300	68000	115300	122440	4000	7140	0.06

**KANPUR**

For Variety Kufri Bahar, recommended dose of Phosphorous application produced highest tuber yield (40.12 t/ha) which was at par with Farmer's practice of application of Phosphorous fertilizers (40.07 t/ha). It indicated that, Farmer's practice was optimum at Kanpur location. Similar trend was observed for net return and B:C values.

Recommended dose of N: P: K (kg/ha) : 180 : 80 : 100

**Table 661:** Plant emergence (%), grade-wise and total yield (t/ha), dry matter content (%), grade-wise tubers numbers (no/ha) and NPK uptake by tubers (t/ha)

Treatment	Emergence (%)	Grade-wise yield of tubers (t/ha)					Total	Dry matter content (%)
		0-25g	25-50g	50-75g	>75g	Total		
T1	93.00	5.77	8.50	13.04	12.77	40.07	17.45	
T2	94.38	3.26	5.34	8.66	8.60	26.45	16.25	
T3	93.30	3.58	6.89	8.98	9.51	27.89	17.30	
T4	94.38	4.65	8.12	10.31	10.90	34.51	17.30	
T5	94.24	5.13	8.71	11.17	11.17	35.53	17.70	
T6	94.48	5.45	8.66	11.38	11.70	37.40	18.20	
T7	95.15	5.98	9.30	12.29	12.56	40.12	17.10	
SEd	1.05	0.25	0.28	0.40	0.49	0.97	0.27	
CD(0.05)	NS	0.53	0.60	0.84	1.05	2.05	0.56	
CV%	1.57	7.33	5.02	5.20	6.33	3.95	2.16	

Table contd.....

Treatment	Grade-wise number of tubers (no/ha)					Nutrient uptake by tuber (t/ha)		
	0-25g	25-50g	50-75g	>75g	Total	N	P	K
T1	395299	272436	213675	200321	1081731	0.08	0.05	0.07
T2	243056	153312	152778	141560	690705	0.06	0.03	0.04
T3	264423	189637	162927	155983	776709	0.06	0.04	0.06
T4	248398	222756	183227	169338	817308	0.07	0.04	0.06
T5	368590	232372	206197	177885	985043	0.08	0.05	0.06
T6	365919	173611	235043	188034	1013355	0.08	0.07	0.21
T7	398504	235577	258547	209936	1102564	0.10	0.08	0.07
SEd	13938	26155	9463	9767	25566	0.00	0.00	0.08
CD(0.05)	29510	55375	20035	20679	54128	0.00	0.00	NS
CV%	6.04	17.50	6.63	7.78	3.91	3.71	3.96	133.03

**Table 662:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	40.07	40000	11000	41000	92000	200350	5000	108350	1.18
T2	26.45	40000	4500	41000	85500	132250	5000	46750	0.55
T3	27.89	40000	5000	41000	86000	139450	5000	53450	0.62

T4	34.51	40000	5800	41000	86800	172550	5000	85750	0.99
T5	35.53	40000	6500	41000	87500	177650	5000	90150	1.03
T6	37.40	40000	7100	41000	88100	187000	5000	98900	1.12
T7	40.12	40000	9000	41000	90000	200600	5000	110600	1.23

## PANTNAGAR

At pantnagar, variety Kufri Surya produced higher and significant tuber yield (34.11 t/ha) from application of recommended dose of Phosphorous over treatment having application of 120 Kg P<sub>2</sub>O<sub>5</sub>/ ha (32.27 t/ha). The same treatment recorded maximum net return (Rs. 1,67,821). It indicated that, recommended dose of P produced optimum yield with maximum economic returns.

Recommended dose of N: P: K (kg/ha) : 160 : 100 : 120

**Table 663:** Initial soil fertility status of the experimental plot

Soil texture	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
Sandy loam					

**Table 664:** Plant emergence (%) and grade-wise yield (t/ha) & number of tubers (no/ha)

Treatment	Emergence (%)	Grade-wise yield of tubers (t/ha)					Grade-wise number of tubers (no/ha)				
		0-25g	25-50g	50-75g	>75g	Total	0-25g	25-50g	50-75g	>75g	Total
T1	97.50	1.22	7.72	6.18	17.04	32.15	66872	90535	83334	86420	327161
T2	100.00	1.40	7.23	7.72	8.47	24.82	83848	124743	94907	46039	349537
T3	98.88	1.38	8.62	8.06	10.45	28.50	67387	132716	78190	94136	372428
T4	97.49	2.19	9.83	9.75	8.88	30.65	71245	130144	79990	65843	347222
T5	99.44	1.15	8.16	8.62	11.43	29.35	62757	135545	85906	69959	354166
T6	98.05	1.85	7.00	8.88	14.54	32.27	67644	129630	68416	93107	358796
T7	96.96	1.41	8.00	7.08	17.63	34.11	67644	116255	73559	84877	342335
SEd	0.82	0.05	0.13	0.54	0.24	0.60	1793	2383	1662	2758	4028
CD(0.05)	1.80	0.12	0.29	1.20	0.53	1.31	3949	5249	3661	6076	8875
CV%	1.02	4.37	1.98	8.27	2.31	2.41	3.15	2.38	2.53	4.38	1.41

**Table 665:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	32.15	80000	9407	72872	162279	321500	10000	159221	0.98
T2	24.82	80000	4507	74572	159079	248200	10000	89121	0.56
T3	28.50	80000	6003	78172	164175	285000	10000	120825	0.74
T4	30.65	80000	7499	80372	167871	306500	10000	138629	0.83
T5	29.35	80000	8995	79072	168067	293500	10000	125433	0.75
T6	32.27	80000	10491	81972	172463	322700	10000	150237	0.87
T7	34.11	80000	9407	83872	173279	341100	10000	167821	0.97

## AGRON.5: ROLE OF BORON IN REDUCING TUBER CRACKING IN PROCESSING VARIETY KUFRI CHIPSONA-3

The experiment was conducted at Jalandhar, Kanpur, Modipuram and Patna.

**Table 666:** Experimental and treatments details at different locations.

Center	Year	Design	Rep	Gross plot size (m <sup>2</sup> )	Net plot size (m <sup>2</sup> )	Spacing (cm)	Date of Planting	Date of Haulm cutting	Date of Harvesting
JAL	2016-17	RBD	4	22.88	15.60	65x20	19.10.16	16.01.17	27.02.17
KAN	2016-17	RBD	4	9.00	4.68	60x20	26.10.16	26.02.17	12.03.17
MDP	2016-17	RBD	4	10.80	7.20	60x20	22.10.16	07.02.17	14.02.17
PAT	2016-17	RBD	4	14.40	10.80	60x20	21.11.16	20.02.17	12.03.17

### Treatments (No FYM may be applied in all the treatments)

- T1 : RDF of NPK only  
T2 : RDF of NPK+2.0 kg B/ha as soil application  
T3 : RDF of NPK+0.1% boric acid as foliar application at 40 DAP  
T4 : RDF of NPK+0.1% boric acid as foliar application in two equal splits at 40 and 60 DAP  
T5 : RDF of NPK + 0.1% boric acid as foliar application in three times at 40, 50 and 60 DAP.

### JALANDHAR

Minimum number of cracked tubers (4487) and cracked tuber yield (0.61 t/ha) was recorded in treatment no. 5 (RDF of NPK + 0.1 % boric acid as foliar application in three times at 40, 50 and 60 DAP). Recommended dose of NPK application produced maximum yield of 20.66 t/ha which was at par with application of recommended dose of NPK along with 2 kg B/ha in the form of soil application (20.38 t/ha). None of the treatment was found remunerative.

**Table 667:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha) and cracked tuber yield (t/ha) & number of cracked tubers (no/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Grade wise no of tubers (no/ha)				
		0-40g	40-100g	100-150g	>150g	Total	0-40g	40-100g	100-150g	>150g	Total
T1	83.75	6.52	7.18	4.89	2.07	20.66	157051	75481	37821	14263	284616
T2	90.50	6.27	7.66	4.47	1.99	20.38	150000	80128	36859	12340	279327
T3	81.00	5.70	7.18	4.44	1.97	19.30	137340	76282	34936	12660	261218
T4	87.50	4.89	6.20	3.37	1.51	15.96	126282	67629	28365	9936	232212
T5	86.75	5.48	6.31	4.65	2.08	18.53	133173	76122	36699	11218	257212
SEd	NS	0.67	0.76	0.48	0.28	1.36	8886	NS	3047	2242	17512
CD(0.05)	4.16	0.30	0.35	0.22	0.13	0.62	4034	6524	1383	1018	7949
CV%	6.84	7.42	7.09	7.01	9.48	4.61	4.05	12.28	5.60	11.91	4.28

Table Contd.....

Treatments	Grade wise yield of cracked tubers (t/ha)					Grade wise no of cracked tubers (no/ha)				
	0-40g	40-100g	100-150g	>150g	Total	0-40g	40-100g	100-150g	>150g	Total
T1	0.01	0.09	0.17	0.34	0.61	321	1122	1282	1923	4647
T2	0.01	0.06	0.13	0.40	0.60	321	801	1122	2404	4647
T3	0.00	0.05	0.27	0.45	0.76	0	641	2083	2564	5288
T4	0.01	0.04	0.20	0.36	0.61	160	481	1603	2244	4487
T5	0.01	0.11	0.20	0.43	0.74	321	1442	1442	2404	5609
SEd	0.01	0.03	0.06	0.10	0.08	298	426	466	689	331
CD(0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS	729
CV%	200.59	66.85	46.01	36.86	16.87	188.08	67.13	43.78	42.20	9.48

**Table 668:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	20.66	35000	12300	68000	115300	82640	4000	-32660	-0.28
T2	20.38	35000	12300	68000	115300	81520	4000	-33780	-0.29
T3	19.30	35000	12300	68000	115300	77200	4000	-38100	-0.33
T4	15.96	35000	12300	68000	115300	63840	4000	-51460	-0.45
T5	18.53	35000	12300	68000	115300	74120	4000	-41180	-0.36

**KANPUR**

Tuber yield was significantly higher when recommended dose of NPK was applied along with 0.1% boric acid in the form of foliar sprays in two equal splits at 40 and 60 days after sowing. The same treatment produced minimum cracked tubers yield (0.26 t/ha) and minimum number of cracked tubers (1603). Maximum net return of Rs. 76,900 and B:C ratio of 0.87 was obtained from the same treatment. It indicated that, at Kanpur condition, three foliar application of 0.1% boric acid at 40, 50 and 60 DAP were effective and economical for minimizing tuber cracking in Kufri Chipsona-3.

**Table 669:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), grade-wise cracked tubers yield (t/ha) & number of cracked tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Grade-wise number of tubers (no/ha)				
		0-40g	40-100g	100-150g	>150g	Total	0-40g	40-100g	100-150g	>150g	Total
T1	96.55	6.52	11.22	6.95	5.56	30.24	222756	213141	59829	24573	526175
T2	97.63	6.36	11.59	7.00	4.49	28.91	216880	209936	61432	18163	506410
T3	96.48	6.57	11.86	6.84	4.70	29.44	211539	218483	57692	20299	508013
T4	97.38	6.09	11.38	6.57	4.86	28.37	203526	223291	56624	19231	502671
T5	94.93	8.01	13.63	6.78	4.60	33.02	243056	252671	57692	16560	569979
SEd	0.53	0.45	0.40	0.57	0.49	1.09	10992	8462	5026	2172	16251
CD(0.05)	1.17	0.99	0.88	NS	NS	2.41	24214	18642	NS	4785	35800
CV%	0.77	9.50	4.72	11.71	14.19	5.15	7.08	5.35	12.12	15.54	4.40

Table Contd.....

Treatment	Grade wise yield of cracked tubers (t/ha)		Grade wise no of cracked tubers (no/ha)		Dry matter content (%)	Yield on dry weight basis (t/ha)	
	>150g	Total	>150g	Total		Tuber	Haulm
T1	0.60	0.60	3740	3740	16.08	5.53	2.93
T2	0.52	0.52	3206	3206	16.28	6.00	2.89
T3	0.44	0.44	2671	2671	17.95	5.33	2.75
T4	0.34	0.34	2137	2137	16.85	4.63	2.43
T5	0.26	0.26	1603	1603	16.03	6.03	2.91
SEd	0.09	0.09	717	717	0.22	0.97	0.50
CD(0.05)	0.20	0.20	NS	NS	0.49	NS	NS
CV%	29.95	29.95	37.95	37.95	1.89	25.03	25.51

**Table 670:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	30.24	40000	63580	41500	145080	151200	5000	6120	0.04
T2	28.91	40000	6475	41500	87975	144550	5000	56575	0.64
T3	29.44	40000	6550	41500	88050	147200	5000	59150	0.67
T4	28.37	40000	6625	41500	88125	141850	5000	53725	0.61
T5	33.02	40000	6700	41500	88200	165100	5000	76900	0.87



## MODIPURAM

Recommended NPK dose application produced optimum yield (49.10 t/ha) which was at par with other treatments of boron application. The same treatment recorded maximum net returns (Rs. 1, 70, 747) with highest B:C ratio (1.38).

**Table 671:** Initial soil fertility status of the experimental plot

Treatments	Soil Texture	EC	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)	Av B
T1	Sandy loam	0.14	0.39	7.00	174.00	35.40	149.00	
T2		0.12	0.33	6.80	148.00	27.80	156.00	
T3		0.15	0.31	7.10	139.00	33.00	151.00	
T4		0.11	0.35	6.60	156.00	42.00	159.00	
T5		0.12	0.39	7.00	174.00	46.00	163.00	

\*OC = Organic Carbon

**Table 672:** Soil fertility status of the experimental plot after experiment

Treatments	Soil Texture	EC	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)	Av B
T1	Sandy loam	0.11	0.40	7.10	178.00	34.00	152.00	
T2		0.12	0.32	7.00	143.00	31.20	159.00	
T3		0.12	0.33	7.00	147.00	35.50	153.00	
T4		0.10	0.39	6.80	174.00	41.00	161.00	
T5		0.12	0.41	7.10	183.00	46.00	159.00	

\*OC = Organic Carbon

**Table 673:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)
		0-40g	40-100g	100-150g	>150 g	Total	
T1	97.92	2.12	10.63	10.70	25.66	49.10	21.47
T2	96.88	2.50	10.04	11.98	23.44	47.96	20.62
T3	96.36	2.46	10.00	12.40	23.44	48.30	21.71
T4	94.27	2.12	8.58	11.67	25.45	47.82	21.49
T5	97.92	2.33	9.65	10.91	26.12	49.00	20.93
SEd	1.91	0.24	0.85	0.86	1.03	0.91	0.70
CD(0.05)	NS	NS	NS	NS	NS	NS	NS
CV%	2.79	14.55	12.25	10.50	5.84	2.67	4.67

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-40g	40-100g	100-150g	>150 g	Total	Tuber	Haulm
T1	149305	199653	100695	125000	574653	10.53	2.77
T2	173611	190972	118056	121181	603820	9.88	2.64
T3	156250	184028	123958	109028	573264	10.50	2.58
T4	157986	164931	110417	128125	561458	10.29	2.92
T5	170139	160764	113542	134028	578472	10.25	2.85
SEd	6403	8852	7276	7315	15325	0.45	0.23
CD(0.05)	14104	19501	NS	16114	NS	NS	NS
CV%	5.61	6.95	9.08	8.38	3.75	6.14	11.87

**Table 674:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	49.10	56000	17720	50133	123853	294600	6000	170747	1.38
T2	47.96	56000	18220	50133	124353	287760	6000	163407	1.31
T3	48.30	56000	18220	50633	124853	289800	6000	164947	1.32

T4	47.82	56000	18720	51133	125853	286920	6000	161067	1.28
T5	49.00	56000	19220	51633	126853	294000	6000	167147	1.32

#### PATNA

Application of RDF of NPK + 0.1 % boric acid as foliar application in three times at 40, 50 and 60 DAP produced maximum yield of 29.10 t/ha which was at par with other boron application treatments.

**Table 675:** Plant emergence (%), grade-wise yield (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)				
		0-40g	40-100g	100-150g	>150 g	Total
T1	95.50	2.83	3.38	10.19	8.71	25.10
T2	94.75	2.92	3.52	10.72	8.68	25.84
T3	94.00	2.85	3.64	11.92	9.86	28.27
T4	94.50	2.96	3.89	11.76	9.84	28.45
T5	94.50	3.10	3.92	12.13	9.96	29.10
SEd	1.02	0.15	0.23	0.52	0.49	0.56
CD(0.05)	NS	NS	NS	1.15	1.08	1.24
CV%	1.52	7.00	9.04	6.50	7.40	2.91

## AGRON.6: RESPONSE OF POTATO TO ZINC APPLICATION

To evaluate the effects of zinc application on potato, trails were conducted at 17 locations viz., Bhubaneshwar, Chhindwara, Dessa, Dholi, Faizabad, Gwalior, Hisar, Jalandhar, Jorhat, Kalyani, Kanpur, Kota, Pantnagar, Pasighat, Patna, Pune and Raipur.

**Table 676:** Experimental and treatments details at different locations.

Center	Year	Design	Rep	Gross plot size (m <sup>2</sup> )	Net plot size (m <sup>2</sup> )	Variety	Spacing (cm)	Date of Planting	Date of Haulm cutting	Date of Harvesting
BHN	2016-17	RBD	4	9.00	7.80	K Surya	60X20	28.11.16	05.02.17	11.02.17
CHN	2016-17	RBD	4	17.28	12.96	K Surya	60X20	09.11.16	22.02.17	02.03.17
DES	2016-17	RBD	4	16.00	12.00	K Badshah	50X20	17.11.16	26.02.17	26.02.17
DHL	2016-17	RBD	4	19.20	12.96	K Lalima	60X20	12.11.16	02.03.17	21.03.17
FZB	2016-17	RBD	4	14.28	9.00	K Lalit	60X20	18.11.16		27.02.17
GWL	2016-17	RBD	4	16.80	12.00	K Jyoti	60X20	07.11.16	09.02.17	13.02.17
HIS	2016-17	RBD	4	16.32	10.80	K Bahar	60X20	27.10.16	05.02.17	23.02.17
JAL	2016-17	RBD	4	22.88	15.60	K Pukhraj	65X20	19.10.16	16.01.17	27.02.17
JRH	2016-17	RBD	4	9.00	5.20	K Jyoti	50X20	17.11.16	16.02.17	23.02.17
KAL	2016-17	RBD	4	12.25	9.00	K Jyoti	60X20	28.11.16	21.02.17	04.03.17
KAN	2016-17	RBD	4	9.00	4.68	K Bahar	60X20	26.10.16	26.02.17	26.03.17
KTT	2016-17	RBD	4	11.52	9.00	K Bahar	60X20	11.11.16	20.02.17	11.03.17
PNT	2016-17	RBD	3	16.80	12.96	K Surya	60X20	25.10.16	02.02.17	16.02.17
PAS	2016-17	RBD	4	19.20	12.96	K Surya	60X20	02.11.16	19.01.17	25.01.17
PAT	2016-17	RBD	4	14.40	10.80	K Sindhuri	60X20	11.11.16	16.03.17	09.03.17
PUN	2016-17	RBD	4	9.00	9.00	K Surya	60X20	07.11.16	08.02.17	15.02.17
RPR	2016-17	RBD	4	7.80	3.96	K Laukar	60X20	13.11.16	11.02.17	18.02.17

### Treatments (No FYM may be applied in all the treatments)

- T1 : RDF of NPK  
T2 : RDF of NPK + 1.5kg Zn/ha  
T3 : RDF of NPK + 3.0 kg Zn/ha  
T4 : RDF of NPK + 4.5 kg Zn/ha  
T5 : RDF of NPK + 6.0 kg Zn/ha

### **BHUBANESHWER**

At Bhubaneswar, plant emergence of variety Kufri surya remained unaffected by zinc application. Application of recommended dose of NPK and 1.5 kg/ha Zinc produced maximum tuber yield (19.16 t/ha) which was at par with other treatments. The same treatment recorded maximum yield on dry weight basis for tubers and haulms (3.75 t/ha and 0.50 t/ha) and maximum net return and B: C ratio of Rs. 36,080 and 0.31 respectively.

Recommended dose of N: P: K (kg/ha) : 150:80:100

**Table 677:** Initial Soil fertility status of the experimental plot

Soil texture	OC*	pH	Av N (kg/ha)	Av P (kg/ha)	Av K (kg/ha)
Sandy loam	0.83	0.27	5.40	275.00	46.39

**Table 678:** Soil fertility status of the experimental plot after experiment

Treatments	EC	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
T1	0.25	0.40	4.83	225.00	41.26	193.53
T2	0.18	0.42	5.03	212.50	69.94	197.56
T3	0.21	0.54	4.83	187.50	54.19	211.00
T4	0.13	0.49	4.82	187.50	67.46	219.07
T5	0.14	0.51	4.91	150.00	64.29	204.28

\*OC = Organic Carbon

**Table 679:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)
		0-25g	25-50g	50-75g	>75g	Total	
T1	98.50	1.10	5.48	6.29	7.08	18.10	18.15
T2	95.50	0.87	4.83	6.18	8.84	19.16	18.07
T3	97.75	1.07	5.92	5.99	7.20	18.78	17.69
T4	97.00	1.05	6.15	5.89	6.63	18.15	17.51
T5	93.50	1.10	5.78	5.46	5.62	16.94	17.74
SEd	1.98	0.05	0.30	0.29	0.38	0.94	0.09
CD(0.05)	NS	0.11	0.65	NS	0.83	NS	0.20
CV%	2.91	6.97	7.43	6.81	7.53	7.29	0.74

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	94872	148718	104808	77885	426282	3.56	0.52
T2	73718	129167	102885	97115	402885	3.75	0.50
T3	92949	159295	101282	80769	434295	3.60	0.51
T4	90705	166346	97116	73398	427564	3.45	0.48
T5	96154	158333	90064	61218	405769	3.26	0.46
SEd	4770	7312	4362	4511	19025	0.19	0.01
CD(0.05)	10508	16108	9608	9938	NS	NS	0.01
CV%	7.52	6.79	6.22	8.17	6.42	7.47	1.46

**Table 680:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	18.10	50000	11400	54000	115400	144800	8000	29400	0.25
T2	19.16	50000	12000	55200	117200	153280	8000	36080	0.31
T3	18.78	50000	12150	55200	117350	150240	8000	32890	0.28
T4	18.15	50000	12300	55200	117500	145200	8000	27700	0.24
T5	16.94	50000	12450	55200	117650	135520	8000	17870	0.15

## CHHINDWARA

After the completion of experiment, available P and K status increased with the application of zinc. Application of recommended dose of NPK application and 6 Kg of Zinc per hectare produced highly significant yield over other treatments in variety Kufri Surya. The same treatment recorded highest dry matter content (19.95%), no of tubers per hectare (3,02,277) and tuber yield on dry weight basis (6.04 t/ha). Also, the same treatment recorded maximum net return and B:C ratio, Rs. 92,365 and 1.24 respectively.

**Table 681:** Initial soil fertility status of the experimental plot

Treatments	Soil Texture	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
T1	Clay loam	0.50	0.57	7.33	196.00	25.00
T2	Clay loam	0.45	0.67	7.26	212.00	22.80
T3	Clay loam	0.55	0.57	7.16	196.00	26.90
T4	Clay loam	0.48	0.79	7.17	229.00	21.60
T5	Clay loam	0.53	0.72	7.16	218.00	25.10

\*OC = Organic Carbon

**Table 682:** Soil fertility status of the experimental plot after the experiment

Treatments	Soil Texture	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
T1	Clay loam	0.50	0.57	7.33	201.00	25.30
T2	Clay loam	0.45	0.67	7.26	215.00	23.10
T3	Clay loam	0.55	0.57	7.16	208.00	27.10
T4	Clay loam	0.48	0.79	7.17	230.00	22.60
T5	Clay loam	0.53	0.72	7.16	220.00	26.50

\*OC = Organic Carbon

**Table 683:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)
		0-25g	25-50g	50-75g	>75g	Total	
T1	95.50	2.80	6.02	7.24	7.93	23.99	19.33
T2	94.25	3.11	6.45	7.89	8.54	25.99	19.53
T3	91.75	3.43	7.23	8.20	9.14	28.00	19.68
T4	94.50	3.80	7.78	8.79	8.90	29.26	19.78
T5	95.25	4.08	8.05	8.75	9.43	30.31	19.95
SEd	1.11	0.21	0.30	0.27	0.27	0.37	0.18
CD(0.05)	2.43	0.46	0.66	0.59	0.59	0.82	0.40
CV%	1.66	8.51	5.97	4.63	4.32	1.91	1.32

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	71374	72531	59992	43017	246914	4.63	1.39
T2	75810	78511	64622	59606	278550	5.07	1.64
T3	79861	81790	67708	64043	293403	5.51	1.65
T4	80826	84491	62693	62886	290895	5.78	1.78
T5	81212	84684	68094	68287	302277	6.04	1.70
SEd	6471	3160	5343	4936	10527	0.10	0.09
CD(0.05)	NS	6961	NS	10875	23191	0.21	0.21
CV%	11.76	5.56	11.69	11.72	5.27	2.48	8.05

**Table 684:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	23.99	35000	8740	28950	72690	131945	5500	59255	0.82
T2	25.99	35000	8890	28950	72840	142945	5500	70105	0.96
T3	28.00	35000	9040	29000	73040	154000	5500	80960	1.11
T4	29.26	35000	9190	29500	73690	160930	5500	87240	1.18
T5	30.31	35000	9340	30000	74340	166705	5500	92365	1.24

**DEESA**

Variety Kufri Badshah produced maximum tuber yield (37.88 t/ha) with application of recommended dose of NPK and 3 kg Zn per hectare, which was at par with rest of the treatments. The same treatment produced maximum no of tuber per hectare (5,20,416) with highest tuber yield on dry weight basis (7.59 t/ha), maximum net return (Rs. 50,411) and B:C ratio (0.50). It indicated at dessa condition, 3 Kg Zn/ha application was remunerative.

Recommended dose of N: P: K (kg/ha) : 275:140:275

**Table 685:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)
		0-25g	25-50g	50-75g	>75g	Total	
T1	90.93	1.02	3.21	16.40	14.87	35.49	20.12
T2	90.15	1.20	3.22	15.53	14.66	34.60	19.66
T3	91.15	1.12	3.15	16.12	17.50	37.88	20.03
T4	90.16	1.19	3.22	14.53	15.73	34.67	19.57
T5	89.95	0.95	2.47	17.23	15.63	36.28	19.99
SEd	0.82	0.14	0.36	1.31	1.67	1.56	0.71
CD(0.05)	NS	NS	NS	NS	NS	NS	NS
CV%	1.27	18.66	16.46	11.59	15.05	6.15	5.06

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Tuber yield on dry weight basis (t/ha)
	0-25g	25-50g	50-75g	>75g	Total	
T1	68333	86875	198334	150833	504375	7.14
T2	79792	87292	189584	145208	501875	6.80
T3	74375	85000	186667	174375	520416	7.59
T4	79375	86875	169792	157917	493958	6.79
T5	63750	62084	208959	155834	490625	7.26
SEd	14410	13169	24381	11174	25884	0.44
CD(0.05)	NS	NS	NS	NS	NS	NS
CV%	27.87	22.82	18.08	10.08	7.29	8.81

**Table 686:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	35.49	45000	17000	38500	100500	141960	4000	41460	0.41
T2	34.60	45000	17304	38500	100804	138400	4000	37596	0.37
T3	37.88	45000	17609	38500	101109	151520	4000	50411	0.50
T4	34.67	45000	17913	38500	101413	138680	4000	37267	0.37
T5	36.28	45000	18217	38500	101717	145120	4000	43403	0.43

## DHOLI

Zinc application had no effect on emergence of variety Kufri Lalima. Application of recommended dose of NPK along with 4.5 kg Zn/ha produced highest tuber yield (27.38 t/ha) which was at par with the application of NPK along with 6 kg Zn/ha (27.27 t/ha). Maximum net return of Rs. 137270 and B:C ratio of 1.69 had made this treatment profitable at Dholi conditions.

Recommended dose of N: P: K (kg/ha) : 150:90:100

**Table 687:** Plant emergence (%) and grade-wise yield (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)				
		0-25g	25-50g	50-75g	75g	Total
T1	98.90	2.50	7.14	5.89	6.62	22.15
T2	97.73	2.82	6.76	7.26	8.42	25.25
T3	98.48	2.36	6.14	7.43	9.36	25.29
T4	98.65	2.10	5.87	8.20	11.22	27.38
T5	97.50	1.55	6.97	8.40	10.37	27.27
SEd	0.89	0.27	0.44	1.16	1.08	1.40
CD(0.05)	N/A	0.58	N/A	N/A	2.37	3.09
CV%	1.28	16.54	9.44	21.99	16.54	7.78

**Table 688:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	22.15	30000	12620	36000	78620	177200	8000	98580	1.25
T2	25.25	30000	13520	36000	79520	202000	8000	122480	1.54
T3	25.29	30000	14420	36000	80420	202320	8000	121900	1.52
T4	27.38	30000	15320	36000	81320	219040	8000	137720	1.69
T5	27.27	30000	16220	36000	82220	218160	8000	135940	1.65

**FAIZABAD**

Variety Kufri Lalit produced maximum tuber yield (35.19 t/ha) with application of recommended dose of NPK and 6 kg zinc per hectare which was at par with tuber yield (32.75 t/ha) produced by application of recommended dose of NPK with 4.5 kg Zn/ha. The same treatment produced maximum no of tubers per hectare (4,42,500), tuber and haulm yield on dry weight basis (6.58 t/ha and 4.95 t/ha respectively). The available NPK and Zinc status of soil improved with the application of zinc. Highest net return of Rs. 1,08,668 and B:C ratio of 1.62 was recorded for the same treatment.

Recommended dose of N: P: K (kg/ha) : 150:100:120

**Table 699:** Initial soil fertility status of the experimental plot

Treatments	Soil Texture	EC	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)	Av Zn
T1	Clay loam	0.31	0.34	8.16	135.60	14.90	232.50	11.90
T2		0.31	0.34	8.16	135.60	14.90	232.50	11.90
T3		0.31	0.34	8.16	135.60	14.90	232.50	11.90
T4		0.31	0.34	8.16	135.60	14.90	232.50	11.90
T5		0.31	0.34	8.16	135.60	14.90	232.50	11.90

\*OC = Organic Carbon

**Table 700:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Total	Dry matter content (%)
		0-25g	25-50g	50-75g	>75g	Total		
T1	92.33	1.75	7.15	10.07	10.22	29.19	18.19	
T2	92.34	1.79	7.14	10.36	10.37	29.66	18.40	
T3	93.67	1.88	7.47	10.71	10.81	30.86	18.56	
T4	93.67	2.00	7.82	11.24	11.69	32.75	18.64	
T5	95.00	2.18	8.61	11.92	12.49	35.19	18.70	
SEd	1.02	0.09	0.37	0.50	0.50	1.45	0.07	
CD(0.05)	NS	0.20	0.82	1.10	1.11	3.20	0.15	
CV%	1.54	6.71	6.87	6.49	6.39	6.52	0.53	

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	124445	204167	154445	115833	367222	5.31	4.18
T2	127778	203889	158889	117500	373056	5.46	4.20
T3	133611	213056	164167	122500	388333	5.73	4.25
T4	142500	223056	172222	132500	405278	6.11	4.51
T5	155556	245833	182500	141389	442500	6.58	4.95
SEd	6611	10737	7529	5855	19051	0.26	0.11
CD(0.05)	14564	23654	16586	12898	41969	0.58	0.25
CV%	6.84	6.97	6.40	6.57	6.82	6.39	3.55

**Table 701:** Soil fertility status of the experimental plot after experiment

Treatments	Soil Texture	EC	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)	Av Zn
T1	Clay loam	0.31	0.34	8.10	137.00	15.00	235.00	11.80
T2		0.30	0.35	8.10	137.60	15.00	236.10	12.00
T3		0.30	0.35	8.10	137.60	15.00	236.50	12.00
T4		0.30	0.35	8.10	137.75	15.00	236.80	12.20
T5		0.30	0.35	8.10	137.90	15.00	237.00	12.40

\*OC = Organic Carbon

**Table 702:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	29.19	25000	11777	30000	66777	145950	5000	79173	1.19
T2	29.66	25000	12012	30000	67012	148300	5000	81288	1.21
T3	30.86	25000	12102	30000	67102	154300	5000	87198	1.30
T4	32.75	25000	12192	30000	67192	163750	5000	96558	1.44
T5	35.19	25000	12282	30000	67282	175950	5000	108668	1.62

**GWALIOR**

Variety Kufri Jyoti produced significantly higher tuber yield (41.93 t/ha) with application of 4.5 Zn Kg/ha along with recommended NPK doses and maximum number of tuber per hectare (6, 31, 857) than other treatment. Highest net return (Rs. 1,72,263) and B:C ratio (2.36) indicated remunerative gains from this treatment at Gwalior conditions.

Recommended dose of N: P: K (kg/ha) : 180:80:120

**Table 703:** Initial soil fertility status of the experimental plot

Soil Texture	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)	Av Cu	Av Zn	Av Fe
Silty clay loam	0.25	7.1	148	30.6	155.5	0.9	0.94	17.06

\*OC = Organic Carbon

**Table 704:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Total	Dry matter content (%)
		0-25g	25-50g	50-75g	>75g	Total		
T1	99.98	1.98	2.48	6.10	28.86	39.43	18.66	
T2	100.00	1.79	2.85	6.02	30.21	40.87	17.77	
T3	99.98	1.65	3.62	5.20	28.85	39.31	19.62	
T4	99.98	1.74	3.03	5.66	31.50	41.93	16.89	
T5	100.00	1.71	3.51	4.65	29.22	39.09	17.83	
SEd	0.04	0.13	0.23	0.16	0.26	0.24	1.15	
CD(0.05)	0.09	NS	0.50	0.36	0.56	0.54	NS	
CV%	0.06	10.03	10.36	4.15	1.22	0.86	8.98	

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	180833	79167	112292	223542	599166	7.36	5.78
T2	159375	91042	98125	212500	565208	7.27	6.19
T3	174792	106875	91667	210000	577500	7.72	5.41
T4	181667	105625	102500	235208	631875	7.08	6.54
T5	163125	108125	82917	222709	575208	6.97	6.33
SEd	26499	3732	8733	4138	34004	0.47	0.57
CD(0.05)	NS	8222	NS	9115	NS	NS	NS
CV%	21.79	5.38	12.67	2.65	8.15	9.14	13.34



**Table 705: Economics**

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	39.43	35000	8066	29800	72866	230666	5850	157800	2.17
T2	40.87	35000	8120	29800	72920	239090	5850	166170	2.28
T3	39.31	35000	8174	29800	72974	229964	5850	156990	2.15
T4	41.93	35000	8228	29800	73028	245291	5850	172263	2.36
T5	39.09	35000	8282	29800	73082	228677	5850	155595	2.13

**HISAR**

Kufri Bahar produced 42.86 t/ha tuber yield with the application of recommended dose of NPK with 4.5 kg of zinc application per hectare, which was at par with recommended NPK application with 6 kg Zn/ha (42.35 t/ha). The same treatment recorded highest dry matter content (19.15 %) and per hectare no of tubers (5,84,259) and the same treatment recorded maximum net return and B:C ratio, Rs. 1,82,780 and 2.46 respectively.

Recommended dose of N: P: K (kg/ha) : 150:50:100

**Table 706: Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)**

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Total	Dry matter content (%)
		0-25g	25-50g	50-75g	>75g			
T1	94.55	1.65	5.99	10.74	18.22	36.60	17.34	
T2	95.16	1.82	6.30	10.98	19.37	38.47	17.98	
T3	95.21	1.98	7.26	11.05	19.74	40.04	18.65	
T4	95.55	1.75	7.94	12.09	21.09	42.86	19.15	
T5	96.26	1.62	7.79	12.07	20.88	42.35	19.03	
SEd	2.64	0.24	0.70	0.41	0.93	1.23	0.53	
CD(0.05)	NS	NS	NS	0.91	NS	2.70	1.17	
CV%	3.91	19.30	13.96	5.14	6.62	4.32	4.08	

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	76389	143518	166204	103704	489815	6.35	1.10
T2	79630	156250	181019	107871	524769	6.93	1.25
T3	84954	163426	189583	112500	550463	7.46	1.38
T4	77083	176389	200463	121991	575926	8.20	1.51
T5	85648	178009	202546	118056	584259	8.06	1.42
SEd	6272	5391	4746	3423	8600	0.34	0.08
CD(0.05)	NS	11875	10455	7541	18945	0.75	0.17
CV%	10.99	4.66	3.57	4.29	2.23	6.46	8.30

**Table 707: Economics**

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	36.60	25000	6645	42199	73844	219600	6000	145756	1.97
T2	38.47	25000	6824	42199	74023	230820	6000	156797	2.12
T3	40.04	25000	7002	42199	74201	240240	6000	166039	2.24
T4	42.86	25000	7181	42199	74380	257160	6000	182780	2.46
T5	42.35	25000	7360	42199	74559	254100	6000	179541	2.41

## JALANDHAR

Application of recommended dose of NPK produced highest tuber yield (33.54 t/ha) in variety Kufri Pukhraj, which was at par with tuber yield produced by application of recommended NPK application with 1.5 kg Zn/ha. The same treatment was reported with highest net return (Rs. 18,160) and B:C ratio (0.16). It indicated that at Jalandhar conditions, no response was observed to zinc application.

Recommended dose of N: P: K (kg/ha) : 240:100:150

**Table 708:** Plant emergence (%) and grade-wise yield (t/ha) & number of tubers (no/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Grade-wise number of tubers (no/ha)				
		0-25g	25-50g	50-75g	>75g	Total	0-25g	25-50g	50-75g	>75g	Total
T1	86.75	3.86	6.86	8.19	14.63	33.54	136058	140064	114103	88942	479167
T2	91.00	4.33	6.72	7.71	12.44	31.19	150321	139744	114263	75160	479487
T3	93.75	3.40	4.86	5.88	11.76	25.90	120673	101282	81731	78366	382052
T4	92.75	3.27	5.51	6.81	10.37	25.96	114263	115064	92789	68750	390866
T5	95.75	3.65	5.91	6.49	14.04	30.10	125481	118269	84135	89263	417148
SEd	4.53	0.32	0.57	0.79	1.07	1.98	7714	8788	8528	8703	18063
CD(0.05)	NS	0.71	1.26	NS	2.35	4.36	16993	19359	18787	NS	39791
CV%	6.96	12.33	13.49	15.88	11.91	9.54	8.43	10.11	12.38	15.37	5.94

**Table 709:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	33.54	35000	13000	68000	116000	134160	4000	18160	0.16
T2	31.19	35000	13100	68500	116600	124760	4000	8160	0.07
T3	25.90	35000	13200	68500	116700	103600	4000	-13100	-0.11
T4	25.96	35000	13300	68500	116800	103840	4000	-12960	-0.11
T5	30.10	35000	13400	68500	116900	120400	4000	3500	0.03

## JORHAT

Variety Kufri Jyoti produced maximum tuber yield (26.37 t/ha) with the application of recommended dose of NPK and 6 kg zinc per hectare which was at par with tuber yield (25.84 t/ha) produced by application of recommended dose of NPK with 4.5 kg Zn/ha. The same treatment had maximum dry matter content in tubers (20.75 %) and haulm (13.08 %), no of tubers per hectare (8,65,358), tuber and haulm yield on dry weight basis (5.22 t/ha and 1.81 t/ha respectively). Highest net return of Rs. 2,36,302 and B:C ratio of 2.95 was recorded for the same treatment. It indicated that, application of 6 kg Zn/ha had improved yield and monetary gains at Jorhat conditions.

**Table 710:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)	
		0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	93.33	2.48	5.36	4.21	4.95	16.99	17.10	11.65
T2	95.25	2.07	5.14	6.01	6.08	19.30	18.00	12.40
T3	95.55	1.54	8.68	6.23	6.20	22.65	19.05	12.65
T4	95.83	1.54	6.99	6.52	10.79	25.84	20.00	12.68
T5	96.37	2.48	9.76	6.28	7.86	26.37	20.75	13.08
SEd	1.15	0.33	1.03	0.86	1.28	0.75	0.29	0.30
CD(0.05)	NS	0.72	2.27	NS	2.82	1.66	0.64	0.66
CV%	1.70	22.95	20.30	20.91	25.23	4.78	2.16	3.39

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	319712	169231	68269	45673	602885	2.67	1.33
T2	342308	131731	92788	46154	612981	3.33	1.46
T3	290866	238462	93750	60577	683654	4.13	1.60
T4	238943	157212	100481	84615	581250	4.62	1.75
T5	335096	337981	109135	83173	865385	5.22	1.81
SEd	10175	14538	10132	4453	14320	0.24	0.06
CD(0.05)	22414	32027	22320	9810	31545	0.53	0.13
CV%	4.71	9.94	15.43	9.84	3.03	8.57	5.03

**Table 711:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	16.99	50000	11582	16840	78422	203880	12000	125458	1.60
T2	19.30	50000	12011	16840	78851	231600	12000	152749	1.94
T3	22.65	50000	12440	16840	79280	271800	12000	192520	2.43
T4	25.84	50000	12869	16840	79709	310080	12000	230371	2.89
T5	26.37	50000	13298	16840	80138	316440	12000	236302	2.95

#### KALYANI

Emergence of tubers was unaffected by varied level of zinc, and it was observed above 98.03%. Grade-wise tuber yield as well as total yield was significantly influenced by zinc application. Result showed that, tuber yield of 'Kufri Jyoti' had increased with increasing level of zinc. Maximum total tuber yield (30.37 t/ha) was produced with application of 6 kg zinc per hectare and recommended dose of NPK along with highest net return ( Rs. 81,894) and B: C ratio (0.82).

**Table 712:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)				
		0-25g	25-50g	50-75g	>75g	Total
T1	99.30	0.63	3.14	5.17	16.31	25.24
T2	98.93	0.88	2.81	5.42	17.33	26.43
T3	99.58	1.25	4.08	6.67	15.47	27.47
T4	98.30	1.36	2.89	6.20	18.42	28.86
T5	99.25	1.04	2.89	5.53	20.92	30.37
SEd	0.75	0.13	0.33	0.37	0.44	0.58
CD(0.05)	NS	0.28	0.73	0.80	0.96	1.28
CV%	1.07	17.11	14.89	8.91	3.50	2.98

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	42500	56667	85000	98889	283056	4.70	3.14
T2	47222	63611	88333	105000	304167	4.97	3.42
T3	43889	54167	91945	111111	301111	5.22	3.67
T4	48611	66111	98334	111111	324167	5.48	3.89
T5	50278	71945	102778	117778	342778	5.84	4.11
SEd	2571	3684	2315	1908	6752	0.12	0.17
CD(0.05)	NS	8117	5100	4204	14875	0.27	0.38
CV%	7.82	8.34	3.51	2.48	3.07	3.32	6.60

**Table 713: Economics**

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	25.24	32000	14614	50000	96614	151440	6000	54826	0.57
T2	26.43	32000	15542	50000	97542	158580	6000	61038	0.63
T3	27.47	32000	16466	50000	98466	164820	6000	66354	0.67
T4	28.86	32000	17399	50000	99399	173160	6000	73761	0.74
T5	30.37	32000	18326	50000	100326	182220	6000	81894	0.82

Price of 1 kg Multi-Zn Rs. 130/- (For one hectare area 7.14 kg = Rs. 928/-)

**KANPUR**

With increase in level of zinc application, increased in tuber yield, grade-wise number of tubers, tuber and haulm yield on dry weight basis was observed in variety Kufri Bahar. The highest total tuber yield (36.97 t/ha) was produced by application of 6 kg zinc per hectare along with recommended NPK doses. However, this yield was at par with the yield produced by application of 4.5 kg Zn/ha with recommended NPK (36.22 t/ha). Highest net return (Rs. 96,900) and B:C ratio (1.10) was recorded in the same treatment.

**Table 714: Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)**

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Total	Dry matter content (%)
		0-25g	25-50g	50-75g	>75g	Total		
T1	96.60	4.28	6.95	10.15	11.91	33.28	16.58	
T2	96.28	4.12	7.00	9.94	13.78	34.78	15.98	
T3	96.53	4.01	6.47	10.58	13.84	34.89	15.83	
T4	97.65	4.38	6.95	11.27	13.63	36.22	16.70	
T5	97.28	4.70	7.27	10.85	13.78	36.97	17.00	
SEd	0.77	0.30	0.31	0.41	0.43	0.83	0.19	
CD(0.05)	NS	NS	NS	0.89	0.96	1.83	0.41	
CV%	1.13	9.96	6.28	5.43	4.59	3.33	1.61	

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	253739	167201	167735	183761	772436	5.23	2.85
T2	238248	175748	167735	191239	771902	5.43	2.96
T3	235043	166667	175748	184829	762287	5.65	3.22
T4	245726	172543	182158	189103	789530	5.89	3.38
T5	270833	201389	181624	192842	846688	5.99	3.77
SEd	14129	5124	9045	3812	15155	0.42	0.36
CD(0.05)	NS	11288	NS	NS	33386	NS	NS
CV%	8.03	4.10	7.31	2.86	2.72	10.57	15.91

**Table 715: Economics**

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	33.28	40000	6300	41200	87500	166400	5000	78900	0.90
T2	34.78	40000	6450	41200	87650	173900	5000	86250	0.98
T3	34.89	40000	6500	41200	87700	174450	5000	86750	0.99
T4	36.22	40000	6650	41200	87850	181100	5000	93250	1.06
T5	36.97	40000	6750	41200	87950	184850	5000	96900	1.10

## KOTA

Variety Kufri Bahar produced highest tuber yield (18.36 t/ha) with recommended NPK doses which was at par with other treatments. Highest net return (Rs. 36,655) and B:C ratio (0.66) were recorded in the same treatment. It indicated that, zinc application had no effect of total tuber yield production of Kufri Bahar and remuneration.

Recommended dose of N: P: K (kg/ha) : 187.5:125:125

**Table 716:** Initial Soil fertility status of the experimental plot

Soil texture	EC	OC*	pH	Av N (kg/ha)	Av P (kg/ha)	Av K (kg/ha)	Av Zn
Clay loam	0.25	0.38	7.5	325	15.5	355	0.37

\*OC = Organic Carbon

**Table 717:** Plant emergence (%), grade-wise yield (t/ha), dry matter content (%) and tuber yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)	Tuber yield on dry weight basis (t/ha)
		0-25g	25-50g	50-75g	>75g	Total		
T1	91.62	2.53	5.95	6.28	3.61	18.36	20.23	3.71
T2	91.04	2.64	5.70	6.08	3.56	17.97	20.28	3.65
T3	92.50	2.59	5.67	6.00	3.53	17.78	20.28	3.61
T4	91.58	2.61	5.73	6.03	3.53	17.89	20.48	3.66
T5	91.67	2.61	5.97	6.25	3.64	18.47	20.20	3.73
SEd	0.82	0.15	0.23	0.33	0.13	0.81	0.16	0.15
CD(0.05)	NS	NS	NS	NS	NS	NS	NS	NS
CV%	1.26	7.88	5.57	7.55	5.22	6.35	1.10	5.59

**Table 718:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	18.36	20000	5470	29675	55145	91800	5000	36655	0.66
T2	17.97	20000	5898	29675	55573	89850	5000	34277	0.62
T3	17.78	20000	6327	29675	56002	88900	5000	32898	0.59
T4	17.89	20000	6755	29675	56430	89450	5000	33020	0.59
T5	18.47	20000	7184	29675	56859	92350	5000	35491	0.62

## PANTNAGAR

Variety Kufri Surya, at pantnagar produced highest tuber yield of 33.89 t/ha when cultivated with application of 3 kg Zn/ha and recommended application of NPK doses and this treatment was at par with 4kg Zn/ha + recommended NPK application (32.33 t/ha). The same treatment recorded maximum net return of Rs. 1,65,461 and B:C ratio of 0.95, which indicated its economic benefits over other treatments.

**Table 719:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), and tuber & haulm yield on dry weight basis (t/ha).

Treatments	Emergence (%)	Grade-wise yield (t/ha)				
		0-25g	25-50g	50-75g	75g	Total
T1	98.89	1.42	9.78	7.59	11.06	29.85
T2	98.33	1.67	8.54	9.39	11.58	31.19
T3	100.00	1.60	8.36	10.16	13.77	33.89
T4	99.72	1.89	8.62	9.21	12.61	32.33
T5	98.61	1.52	7.08	10.81	12.35	31.76
SEd	0.64	0.06	0.31	0.47	0.61	0.71

CD(0.05)	NS	0.14	0.73	1.11	1.44	1.65
CV%	0.79	4.39	4.50	6.13	6.12	2.72

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	116512	156636	98508	76389	448045	6.22	2.62
T2	123971	135288	128344	76389	463992	6.01	2.38
T3	121656	138117	111883	92850	464506	5.74	2.39
T4	122685	145833	116255	81276	466049	5.64	2.27
T5	121914	132459	131173	80762	466307	6.17	2.31
SEd	2099	2170	2882	2231	5983	0.31	0.26
CD(0.05)	NS	5082	6750	5223	NS	NS	NS
CV%	2.12	1.88	3.01	3.35	1.59	6.41	13.05

**Table 720:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	29.85	80000	9507	79572	169079	298500	10000	129421	0.77
T2	31.19	80000	9687	80872	170559	311900	10000	141341	0.83
T3	33.89	80000	9867	83572	173439	338900	10000	165461	0.95
T4	32.33	80000	10047	82072	172119	323300	10000	151181	0.88
T5	31.76	80000	10227	81472	171699	317600	10000	145901	0.85

## PASIGHAT

At Pasighat, variety Kufri Surya, produced significantly highest tuber yield (23.74 t/ha) with application of 3 kg Zn/ha and recommended application of NPK doses over treatment of 4 kg Zn/ha + recommended NPK application (21.62 t/ha).

**Table 721:** Initial soil fertility status of the experimental plot.

Treatments	Soil texture	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
T1	Loamy sand	2.00	6.60	364.00	38.00	179.00
T2		2.00	6.70	365.00	38.00	178.50
T3		2.10	6.70	364.00	38.00	179.00
T4		2.00	6.60	366.00	37.00	178.25
T5		2.10	6.70	364.00	38.00	178.00

\*= Organic carbon content of soil.

**Table 722:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha) and dry matter content (%)

Treat-ments	Emer-gence (%)	Grade-wise yield (t/ha)					Grade-wise number of tubers (no/ha)					Dry matter content (%)
		0-25g	25-50g	50-75g	>75g	Total	0-25g	25-50g	50-75g	>75g	Total	
T1	76.50	4.64	5.60	4.25	2.16	16.64	255016	138310	68673	25656	487655	21.35
T2	77.50	5.98	5.79	6.76	1.93	20.46	331597	145448	107639	21219	605903	17.80
T3	81.50	3.32	7.53	8.88	4.01	23.74	181713	188657	140432	46297	557099	21.59
T4	79.50	5.21	6.37	7.34	2.70	21.62	294753	162230	117284	31250	605517	17.47
T5	78.63	6.37	5.79	6.56	2.32	21.21	342207	143326	103588	27006	616127	22.38
SEd	1.58	0.33	0.33	0.50	0.41	0.60	18989	8793	8194	4254	21418	0.65
CD(0.05)	NS	0.72	0.74	1.11	0.90	1.31	41832	19370	18052	9371	47183	1.42
CV%	2.84	8.99	7.60	10.53	22.05	4.07	9.56	7.99	10.78	19.86	5.27	4.54

## PATNA

Grade-wise tuber yield as well as total yield was influenced by zinc application. Result showed that, tuber yield of 'Kufri Jyoti' had increased with increasing level of zinc. Maximum total tuber yield (37.63 t/ha) was produced with application of 6 kg zinc per hectare and recommended dose of NPK which was at par with yield produced by application of 4.5 kg Zn/ha + recommended dose of NPK.

Recommended dose of N: P: K (kg/ha) : 150:60:80

**Table 723:** Plant emergence (%) and grade-wise yield (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)				
		0-25g	25-50g	50-75g	>75g	Total
T1	97.50	9.26	6.56	10.71	4.17	30.70
T2	95.50	10.28	6.77	10.85	4.84	32.74
T3	95.50	9.68	6.51	10.91	6.18	33.28
T4	96.00	9.91	7.23	11.79	6.90	35.83
T5	95.25	10.33	7.56	12.08	7.67	37.63
SEd	0.70	1.29	0.75	0.46	0.54	1.44
CD(0.05)	1.53	NS	NS	1.02	1.20	3.17
CV%	1.03	18.49	15.32	5.82	12.89	5.98

## PUNE

Recommended dose of NPK + 2.0 kg zinc application per hectare produced significantly higher tuber yield (22.17 t/ha) over treatment with recommended NPK application only (18.79 t/ha). Highest net return of Rs. 1,57,900 and B:C ratio of 2.47 indicated that in Pune condition application of 2 Kg Zn/ha was optimum for variety Kufri Surya during 2016-17.

**Table 724:** Initial soil fertility status of the experimental plot

Treatments	Soil Texture	EC	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)	Av Zn
T1	Light Black	0.45	0.71	7.10	186.00	31.00	366.00	0.52
T2		0.50	0.70	7.30	189.00	36.00	361.00	0.53
T3		0.54	0.71	7.30	183.00	36.00	363.00	0.50
T4		0.47	0.72	7.20	181.00	34.50	360.00	0.51
T5		0.51	0.73	7.10	182.00	34.00	362.00	0.52

\*OC = Organic Carbon

**Table 725:** Soil fertility status of the experimental plot after the experiment

Treatments	Soil Texture	EC	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)	Av Zn
T1	Light Black	0.50	0.71	7.10	176.00	30.80	354.00	0.50
T2		0.48	0.73	7.30	178.00	33.40	360.00	0.51
T3		0.47	0.71	7.30	175.00	35.50	361.00	0.49
T4		0.49	0.70	7.10	178.00	33.80	355.00	0.50
T5		0.53	0.71	7.20	174.00	33.00	354.00	0.48

\*OC = Organic Carbon

**Table 726:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)
		0-25g	25-50g	50-75g	>75g	Total	
T1	91.00	1.74	2.86	10.12	4.07	18.79	16.36
T2	91.75	1.71	2.88	11.17	6.42	22.17	18.18
T3	89.25	1.61	2.68	9.13	5.29	18.70	17.41

T4	88.50	1.26	2.30	8.46	4.78	16.81	18.24
T5	88.43	1.43	2.35	7.33	4.68	15.79	18.33
SEd	1.45	0.07	0.13	0.34	0.20	0.54	0.17
CD(0.05)	NS	0.16	0.29	0.75	0.43	1.18	0.36
CV%	2.28	6.40	7.01	5.24	5.46	4.10	1.32

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	89722	102222	185556	53333	430834	2.78	1.29
T2	90278	103056	203334	85833	482500	3.81	1.38
T3	91111	99167	164444	69167	423889	4.38	1.66
T4	60834	78056	155556	65834	360278	5.14	1.51
T5	61111	70556	135000	61945	328611	5.25	1.43
SEd	2397	3226	4167	3087	5523	0.05	0.03
CD(0.05)	5281	7106	9180	6799	12167	0.10	0.06
CV%	4.31	5.04	3.49	6.49	1.93	1.51	2.75

**Table 727:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	18.79	35000	11580	16800	63380	187900	10000	124520	1.96
T2	22.17	35000	12000	16800	63800	221700	10000	157900	2.47
T3	18.7	35000	12440	16800	64240	187000	10000	122760	1.91
T4	16.81	35000	12871	16800	64671	168100	10000	103429	1.60
T5	15.79	35000	13298	16800	65098	157900	10000	92802	1.43

## RAIPUR

Variety Kufri Lavkar produced highest tuber yield (19.55 t/ha) with application of 3.0 kg Zn/ha along with recommended NPK doses which was at par with treatment 4 kg Zn/ha + recommended NPK application (18.38 t/ha). Maximum net return (Rs. 1, 12,554) and B:C ratio (1.36) was recorded for the same treatment.

**Table 728:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)
		0-25g	25-50g	50-75g	>75g	Total	
T1	94.27	3.28	3.41	2.20	3.17	15.59	19.54
T2	93.75	4.30	3.86	2.65	3.42	17.32	20.79
T3	94.79	4.36	4.88	3.23	3.74	19.55	20.77
T4	91.67	4.09	4.32	3.95	3.65	18.38	20.82
T5	91.15	4.24	4.26	2.62	3.43	17.52	20.73
SEd	3.60	0.40	0.54	0.84	0.10	0.89	0.26
CD(0.05)	NS	NS	NS	NS	0.22	1.97	0.58
CV%	5.46	14.04	18.39	40.42	4.04	7.15	1.80

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	174243	68813	30303	27778	366793	3.06	30.38
T2	143308	65657	43561	29041	320076	3.60	38.86
T3	171086	80808	49874	32197	366793	4.06	41.67
T4	161616	74495	59344	30934	350379	3.84	44.60
T5	174874	75758	42298	30935	354167	3.63	49.77
SEd	47342	12285	10426	1252	56343	0.20	1.21
CD(0.05)	NS	NS	NS	2758	NS	0.45	2.67
CV%	40.57	23.77	32.71	5.87	22.66	7.85	4.18



**Table 729:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns* (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	15.59	40000	9154	28792	77946	155900	10000	77954	1.00
T2	17.32	40000	11654	28792	80446	173200	10000	92754	1.15
T3	19.55	40000	14154	28792	82946	195500	10000	112554	1.36
T4	18.38	40000	16654	28792	85446	183800	10000	98354	1.15
T5	17.52	40000	19154	28792	87946	175200	10000	87254	0.99

## AGRON.7: EVALUATION OF POTATO - TRANSPLANTED ONION SEQUENCE. AGON 8:

The trail was conducted at Faizabad, Kalyani and Patna.

**Table 730:** Experimental and treatments details at different locations.

Center	FZB		KAL		PAT		
Year	2016-17		2016-17		2016-17		
Design	RBD		RBD		RBD		
Rep	4		4		4		
Gross plot size (m <sup>2</sup> )	14.28		12.25		14.40		
Net plot size (m <sup>2</sup> )	9.00		9.00		10.80		
Variety	K Ashoka		K Jyoti		K Pukhraj		
Spacing (cm)	60 x 20		60 x 20		60 x 20		
Date of Planting	D1	20.11.16	25.11.16		05.11.16		
	D2	10.11.16	15.11.16		15.11.16		
	D3	30.11.16	05.12.16		25.11.16		
Date of Haulm cutting		H1	H2	H1	H2	H1	H2
	D1	04.02.17	14.02.17			25.01.17	05.02.17
	D2	24.01.17	04.02.17			05.02.17	15.02.17
	D3	13.02.17	23.02.17			15.02.17	25.02.17
Date of Harvesting	D1			28.02.17		05.02.17 & 15.02.17	
	D2			18.02.17		15.02.17 & 25.02.17	
	D3			09.03.17		25.02.17 & 05.03.17	
Recommended dose of N: P: K (kg/ha)	150:100:120		200:150:150		150:60:80		

**Treatments:** combinations of planting and harvesting dates of potato

Dates of planting : 3 (optimum, 10 days before and 10 days after optimum)  
 Dates of harvesting : 2 (80 and 90 days after planting)

### FAIZABAD

Planting of Kufri Ashoka at optimum time of planting and harvesting at 90 DAP produced significantly higher tuber yield (30.69 t/ha). Maximum net return (Rs. 86,890) and B:C (1.31) ratio was obtained from the same planting and harvesting time combination. Highest onion bulbs yield (22.44 t/ha) was recorded with planting of potato ten days before optimum and harvesting it at 80DAP which was at par with yield (21.65 t/ha) produced by planting onion bulbs at optimum dates and harvesting at 80 DAP. The data indicated that, plating of potato-onion sequence at optimum time was remunerative at Faizabad conditions.

**Table 731:** Plant emergence (%), grade-wise yield (t/ha) and nutrient N, P & K uptake (kg/ha) by potato & onion crop

Treatment	Emergence (%)			Yield 0-25 (t/ha)			Yield 25-50 (t/ha)		
	H1	H2	Means	H1	H2	Means	H1	H2	Means
D1	95.00	92.34	93.67	1.47	1.26	1.36	6.35	7.65	7.00
D2	93.67	93.67	93.67	1.52	1.32	1.42	8.38	9.68	9.03
D3	92.33	93.34	92.83	1.59	1.37	1.48	6.32	7.15	6.74
Means	93.67	93.11		1.52	1.32		7.01	8.16	
SE (D)	0.76			0.05			0.24		
SE (H)	0.62			0.04			0.20		
SE (DH)	1.08			0.07			0.34		
CD D ( 5%)	NS			NS			0.52		
CD H ( 5%)	NS			0.09			0.43		
CD DH (5%)	NS			NS			NS		
Treatment	Yield 50-75 (t/ha)			Yield >75 (t/ha)			Total yield (t/ha)		
	H1	H2	Means	H1	H2	Means	H1	H2	Means
D1	8.04	9.89	8.97	7.93	9.36	8.65	23.79	28.16	25.97

D2	9.71	10.50	10.10	8.85	9.20	9.02	28.44	30.69	29.57
D3	8.32	9.17	8.74	7.71	9.03	8.37	23.93	26.72	25.32
Means	8.69	9.85		8.16	9.19		25.39	28.52	
SE (D)	0.38			0.23			0.56		
SE (H)	0.31			0.18			0.45		
SE (DH)	0.54			0.32			0.78		
CD D ( 5%)	0.82			0.48			1.19		
CD H ( 5%)	0.67			0.40			0.97		
CD DH (5%)	NS			NS			NS		
Treatment	Onion survival (%)			Total onion yield (t/ha)			% DM Content		
	H1	H2	Means	H1	H2	Means	H1	H2	Means
D1	80.08	77.53	78.80	22.44	20.89	21.66	17.85	18.08	17.96
D2	78.38	76.83	77.60	21.65	19.53	20.59	13.88	18.18	16.03
D3	77.30	75.40	76.35	17.22	15.08	16.15	17.83	18.17	18.00
Means	78.58	76.58		20.44	18.50		16.52	18.14	
SE (D)	0.48			0.59			1.64		
SE (H)	0.39			0.48			1.34		
SE (DH)	0.67			0.83			2.31		
CD D ( 5%)	1.02			1.26			NS		
CD H ( 5%)	0.84			1.03			NS		
CD DH (5%)	NS			NS			NS		
CV (%)									
Treatment	Nutrient N composition (%)			Nutrient P composition (%)			Nutrient K composition (%)		
	H1	H2	Means	H1	H2	Means	H1	H2	Means
D1	2.56	2.57	2.56	0.74	0.77	0.75	2.10	2.11	2.10
D2	2.56	2.59	2.57	0.79	0.79	0.79	2.12	1.87	1.99
D3	2.58	2.58	2.58	0.80	0.80	0.80	2.12	2.13	2.12
Means	2.57	2.58		0.78	0.79		2.11	2.03	
SE (D)	0.01			0.01			0.10		
SE (H)	0.01			0.01			0.08		
SE (DH)	0.01			0.01			0.15		
CD D ( 5%)	NS			0.02			NS		
CD H ( 5%)	NS			NS			NS		
CD DH (5%)	NS			NS			NS		
CV (%)									
Treatment	Nutrient N uptake by potato (kg/ha)			Nutrient P uptake by potato (kg/ha)			Nutrient K uptake by potato (kg/ha)		
	H1	H2	Means	H1	H2	Means	H1	H2	Means
D1	108.70	130.70	119.70	31.35	39.22	35.28	88.94	107.30	98.12
D2	100.44	144.22	122.33	30.98	44.08	37.53	82.97	103.98	93.47
D3	110.14	125.10	117.62	33.92	38.84	36.38	90.43	103.16	96.80
Means	106.43	133.34		32.09	40.71		87.45	104.81	
SE (D)	12.35			3.82			10.70		
SE (H)	10.09			3.12			8.73		
SE (DH)	17.47			5.41			15.13		
CD D ( 5%)	NS			NS			NS		
CD H ( 5%)	21.70			6.72			NS		
CD DH (5%)	NS			NS			NS		
CV (%)									
Treatment	Nutrient N uptake by Onion (kg/ha)			Nutrient P uptake by Onion (kg/ha)			Nutrient K uptake by Onion (kg/ha)		
	H1	H2	Means	H1	H2	Means	H1	H2	Means
D1	86.41	80.42	83.42	23.35	21.72	22.53	63.97	59.53	61.75
D2	83.37	75.18	79.27	22.52	20.31	21.42	61.71	55.66	58.68
D3	66.31	58.07	62.19	17.91	15.69	16.80	49.08	42.99	46.04
Means	78.69	71.23		21.26	19.24		58.25	52.73	
SE (D)	2.26			0.61			1.67		
SE (H)	1.84			0.50			1.37		
SE (DH)	3.19			0.86			2.36		
CD D ( 5%)	4.86			1.31			3.60		

CD H ( 5%)	3.96			1.07			2.94		
CD DH (5%)	NS			NS			NS		
CV (%)									
Treatment	Total N uptake (kg/ha)			Total P uptake (kg/ha)			Total K uptake (kg/ha)		
	H1	H2	Means	H1	H2	Means	H1	H2	Means
D1	195.11	211.12	203.12	54.69	60.94	57.82	152.91	166.83	159.87
D2	183.80	219.40	201.60	53.50	64.38	58.94	144.68	159.63	152.16
D3	176.45	183.17	179.81	51.83	54.53	53.18	139.51	146.15	142.83
Means	185.12	204.56		53.34	59.95		145.70	157.54	
SE (D)	13.26			4.11			11.11		
SE (H)	10.83			3.36			9.07		
SE (DH)	18.76			5.81			15.72		
CD D ( 5%)	NS			NS			NS		
CD H ( 5%)	NS			NS			NS		
CD DH (5%)	NS			NS			NS		
CV (%)									

**Table 732:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
D <sub>1</sub> H <sub>1</sub>	23.79	25000	9560	32000	66560	118950	5000	52390	0.79
D <sub>1</sub> H <sub>2</sub>	28.16	25000	9560	32000	66560	140800	5000	74240	1.12
D <sub>2</sub> H <sub>1</sub>	28.44	25000	9560	32000	66560	142200	5000	75640	1.14
D <sub>2</sub> H <sub>2</sub>	30.69	25000	9560	32000	66560	153450	5000	86890	1.31
D <sub>3</sub> H <sub>1</sub>	23.93	25000	9560	32000	66560	119650	5000	53090	0.80
D <sub>3</sub> H <sub>2</sub>	26.72	25000	9560	32000	66560	133600	5000	67040	1.01

### KALYANI

The results revealed that dates of planting and harvesting had a significant influence upon the yield of potato tubers. Planting at 10days after optimum recorded the highest tuber yield (28.11 t/ha) of potato under West Bengal situation during 2016-17 due to late onset of winter season. The results also revealed that dates of planting in potato, dates of harvesting in potato and interaction of these two factors significantly influenced the yield of onion bulbs under West Bengal situation. Highest onion bulbs yield was recorded with planting of potato ten days after optimum and harvesting it at 90 DAP.

Note: Immediately after harvesting of potato crop onion seedlings were transplanted as per technical programme.

**Table 733:** Plant emergence (%), grade-wise yield (t/ha), onion survival (%) and total onion bulb yield (t/ha)

Treatment	Emergence (%)			Yield 0-25 (t/ha)			Yield 25-50 (t/ha)		
	H1	H2	Means	H1	H2	Means	H1	H2	Means
D1	99.55	99.60	99.58	0.65	0.67	0.66	2.36	2.25	2.31
D2	99.90	100.00	99.95	0.60	0.56	0.58	3.33	3.00	3.17
D3	99.83	100.00	99.91	0.60	0.65	0.62	3.25	2.78	3.01
Means	99.76	99.87		0.61	0.62		2.98	2.68	
SE (D)	0.22			0.06			0.25		
SE (H)	0.18			0.05			0.20		
SE (DH)	0.31			0.08			0.35		
CD D ( 5%)	NS			NS			0.53		
CD H ( 5%)	NS			NS			NS		
CD DH (5%)	NS			NS			NS		
Treatment	Yield 50-75 (t/ha)			Yield >75 (t/ha)			Total yield (t/ha)		
	H1	H2	Means	H1	H2	Means	H1	H2	Means
D1	3.56	4.75	4.15	15.33	17.17	16.25	21.90	24.84	23.37
D2	3.64	4.14	3.89	17.83	19.72	18.78	25.40	27.41	26.41
D3	4.09	4.84	4.46	19.28	20.75	20.01	27.21	29.01	28.11
Means	3.76	4.57		17.48	19.21		24.83	27.09	
SE (D)	0.27			0.61			0.72		

SE (H)	0.22			0.50			0.59		
SE (DH)	0.38			0.86			1.01		
CD D ( 5%)	NS			1.31			1.54		
CD H ( 5%)	0.48			1.07			1.26		
CD DH (5%)	NS			NS			NS		
Treatment	Onion bulb yield (t/ha)								
	H1	H2	Means						
D1	2.38	2.98	2.68						
D2	1.70	2.20	1.95						
D3	3.45	3.95	3.7						
Means	2.51	3.04							
SE (D)	0.09								
SE (H)	0.07								
SE (DH)	0.13								
CD D ( 5%)	0.30								
CD H ( 5%)	0.20								
CD DH (5%)	0.40								

### PATNA

Kufri Pukhraj produced maximum tuber yield (29.33 t/ha) when planted at 10 days after optimum under Patna conditions.

**Table 734:** Plant emergence (%) and grade-wise yield (t/ha)

Treatment	Emergence (%)			Yield 0-25 (t/ha)			Yield 25-50 (t/ha)		
	H1	H2	Means	H1	H2	Means	H1	H2	Means
D1	96.00	96.00	96.00	1.98	2.85	2.41	6.28	6.83	6.55
D2	96.50	95.50	96.00	2.55	4.75	3.65	6.60	7.15	6.88
D3	95.50	94.25	94.88	2.53	2.80	2.66	6.83	7.53	7.18
Means	96.00	95.25		2.35	3.47		6.57	7.17	
SE (D)	0.48			0.28			0.41		
SE (H)	0.39			0.23			0.33		
SE (DH)	0.67			0.40			0.57		
CD D ( 5%)	1.03			0.61			NS		
CD H ( 5%)	NS			0.50			NS		
CD DH (5%)	NS			0.86			NS		
Treatment	Yield 50-75 (t/ha)			Yield >75 (t/ha)			Total yield (t/ha)		
	H1	H2	Means	H1	H2	Means	H1	H2	Means
D1	9.48	10.25	9.86	6.28	7.08	6.68	24.10	26.98	25.54
D2	9.90	10.70	10.30	4.80	5.80	5.30	23.88	28.40	26.14
D3	10.23	11.28	10.75	5.00	7.70	6.35	24.53	29.33	26.93
Means	9.87	10.74		5.36	6.86		24.17	28.23	
SE (D)	0.62			0.64			1.00		
SE (H)	0.50			0.52			0.81		
SE (DH)	0.87			0.90			1.41		
CD D ( 5%)	NS			NS			NS		
CD H ( 5%)	NS			1.12			1.75		
CD DH (5%)	NS			NS			NS		
Treatment	Onion survival (%)			Onion yield (t/ha)					
	H1	H2	Means	H1	H2	Means			
D1	92.31	92.05	92.18	19.28	19.80	19.54			
D2	92.98	90.60	91.79	20.26	18.87	19.56			
D3	85.55	82.90	84.23	16.47	13.36	14.91			
Means	90.28	88.52		18.67	17.34				
SE (D)	1.01			0.43					
SE (H)	0.82			0.35					
SE (DH)	1.43			0.61					
CD D ( 5%)	2.17			0.93					
CD H ( 5%)	1.77			0.76					
CD DH (5%)	NS			1.32					

## AGRON 8: DEVELOPMENT OF POTATO BASED ORGANIC FARMING SYSTEM FOR POTATO

The experiment was conducted at Dholi, Faizabad, Gwalior, Hisar, Jorhat and Pasighat.

**Table 735:** Experimental and treatments details at different locations.

Center	Year	Design	Rep	Gross plot size (m <sup>2</sup> )	Net plot size (m <sup>2</sup> )	Variety	Spacing (cm)	Date of Planting	Date of Haulm cutting	Date of Harvesting
DHL	2016-17	RBD	4	19.20	12.96	K Jyoti	60x20	14.11.17	28.02.17	15.03.17
FZB	2016-17	RBD	4	19.20	12.96	K Anand	60x20	20.11.16	25.02.17	03.03.17
GWL	2016-17	RBD	4	19.20	12.96	K Jyoti	60x20	22.10.16	31.01.17	04.02.17
HIS	2016-17	RBD	4	19.20	12.96	K Bahar	60x20	06.11.16	15.02.17	03.03.17
JRH	2016-17	RBD	4	19.20	12.96	K Megha	60x20	05.12.16	07.03.17	14.03.17
PAS	2016-17	RBD	4	19.20	12.96	K Bahar	60x20	05.11.16	04.02.17	10.02.17

### Treatments

- T1 : Absolute control  
 T2 : Inorganic practices standard technology  
 T3 : Crop residue based: compositing of available cheaper crop/weed residues (like NADEP method) + Crop residue incorporation (Main crop/catch/green manuring/bio-fumigation crop) + biofertilizer (*Azotobacter* and Phosphobacteria) + microbial culture to decompose crop residues  
 T4 : T3 + FYM @ 25 t/ha  
 T5 : T3 + Vermicompost 7.5 t/ha

### DHOLI

At Dholi Conditions, Crop residue based: compositing of available cheaper crop/weed residues (like NADEP method) + Crop residue incorporation (Main crop/catch/green manuring/bio-fumigation crop) + biofertilizer (*Azotobacter* and Phosphobacteria) + microbial culture to decompose crop residues along with vermicompost application @ 7.5 t/ha produced maximum yield of 22.81 t/ha, which was significantly higher over other treatments. However maximum net return of Rs. 97,730 and B:C of 1.27 was recorded in T3. The cost of vermicompost increased the cost of production which resulted in low net return and B:C ratio.

**Table 736:** Soil fertility status of the experimental plot

Soil texture	OC*	pH	Av N (kg/ha)	Av P (kg/ha)	Av K (kg/ha)
Sandy loam	0.46	8.3	1.9	19.6	114.8

**Table 737:** Plant emergence (%), marketable, non-marketable and total tuber yield (t/ha)

Treatments	Emergence (%)	Marketable yield (t/ha)	Non-marketable yield (t/ha)	Total yield (t/ha)
T1	97.50	11.85	1.12	12.97
T2	99.15	19.96	1.86	21.81
T3	97.60	15.48	1.78	17.26
T4	98.25	19.77	1.43	21.20
T5	99.15	21.46	1.31	22.81
SEd	NS	2.33	NS	2.19
CD(0.05)	0.89	1.06	0.34	0.99
CV %	1.28	8.43	32.10	7.31

**Table 738:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	12.97	30000	0	36000	66000	103760	8000	37760	0.57

T2	21.81	30000	10750	36000	76750	174480	8000	97730	1.27
T3	17.26	30000	5540	36000	71540	138080	8000	66540	0.93
T4	21.20	30000	21680	36000	87680	169600	8000	81920	0.93
T5	22.81	30000	36740	36000	102740	182480	8000	79740	0.78

## FAIZABAD

At Faizabad Conditions, maximum yield of 26.16 t/ha was produced from organic treatment of Crop residue based: compositing of available cheaper crop/weed residues (like NADEP method) + Crop residue incorporation (Main crop/catch/green manuring/bio-fumigation crop) + biofertilizer (*Azotobacter* and Phosphobacteria) + microbial culture to decompose crop residues along with vermicompost application @ 7.5 t/ha as compared to other Absolute control. The same treatment excluding vermicompost application recorded net return of Rs. 41,300 and B:C ratio of 0.74. The data showed that, though organic treatments increased the tuber yield, they did not differ statistically among themselves.

**Table 739:** Initial soil fertility status of the experimental plot

Treatments	Soil Texture	EC	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)	Av K
T1	Clay loam	0.32	0.34	8.10	133.60	14.70	222.50	0.32
T2		0.30	0.35	8.10	135.70	14.90	224.00	0.30
T3		0.30	0.35	8.10	136.00	14.90	224.00	0.30
T4		0.30	0.35	8.10	136.00	14.90	224.00	0.30
T5		0.30	0.35	8.10	136.00	14.90	224.00	0.30

\*OC = Organic Carbon

**Table 740:** Plant emergence (%), marketable, non-marketable and total tuber yield (t/ha)

Treatments	Emergence (%)	Marketable yield (t/ha)	Non-marketable yield (t/ha)	Total yield (t/ha)
T1	92.13	11.64	4.30	15.93
T2	92.82	32.26	2.85	35.11
T3	93.29	16.12	3.36	19.48
T4	91.90	18.48	3.94	22.42
T5	93.06	23.02	3.15	26.16
SEd	0.74	1.82	0.15	1.81
CD(0.05)	NS	4.01	0.33	3.99
CV %	1.13	12.69	6.07	10.76

**Table 741:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	15.93	25000	0	30000	55000	79650	5000	24650	0.45
T2	35.11	25000	11200	30000	66200	175550	5000	109350	1.65
T3	19.48	25000	1100	30000	56100	97400	5000	41300	0.74
T4	22.42	25000	17225	30000	72225	112100	5000	39875	0.55
T5	26.16	25000	37300	30000	92300	130800	5000	38500	0.42

## GWALIOR

Organic treatments increase the yield over control both in potato and sequential crop; however, they were at par with each others. With organic treatment, Maximum marketable yield (21.49 t/ha) and net return (Rs. 53,591) was produced from T-4 (Crop residue based: compositing of available cheaper crop/weed residues (like NADEP method) + Crop residue incorporation (Main crop/catch/green manuring/bio-fumigation crop) + biofertilizer (*Azotobacter* and Phosphobacteria) + microbial culture to decompose crop residues + FYM @ 25 t/ha)

**Table 742:** Soil fertility status of the experimental plot before & after experiment

Soil texture	EC	OC*	pH	Av N (kg/ha)	Av P (kg/ha)	Av K (kg/ha)
Silty clay loam	0.1	0.3	7.68	155	23.7	338

**Table 743:** Plant emergence (%), marketable, non-marketable and total tuber yield (t/ha)

Treatment	Emergence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Non-mkt yield (t/ha)	Emergence (%)	Total yield (t/ha)	Mkt yield (t/ha)
T1	90.00	19.44	18.60	0.84	76.04	5.09	5.09
T2	96.88	27.13	25.88	1.25	66.05	9.23	9.23
T3	91.88	20.04	19.16	0.88	64.79	8.60	8.60
T4	94.38	22.73	21.49	1.24	65.63	6.45	6.45
T5	90.63	21.27	20.10	1.16	59.59	5.33	5.33
SEd	3.51	0.76	0.83	0.10	3.09	0.48	0.48
CD(0.05)	NS	1.67	1.84	0.22	6.82	1.05	1.05
CV %	5.35	4.85	5.61	13.06	6.59	9.71	9.71

**Table 744:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns* (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	19.44	35000	0	29800	64800	113724	5850	48924	0.76
T2	27.13	35000	8066	29800	72866	158711	5850	85845	1.18
T3	20.04	35000	2080	29800	66880	117234	5850	50354	0.75
T4	22.73	35000	14580	29800	79380	132971	5850	53591	0.68
T5	21.27	35000	24580	29800	89380	124430	5850	35050	0.39

## HISAR

As compared to inorganic treatment and absolute control, maximum potato tuber yield (33.76 t/ha) and sequential crop yield (13.26 t/ha) was produced from organic treatment comprising application of Crop residue based: compositing of available cheaper crop/weed residues (like NADEP method) + Crop residue incorporation (Main crop/catch/green manuring/bio-fumigation crop) + biofertilizer (*Azotobacter* and *Phosphobacteria*) + microbial culture to decompose crop residues + FYM @ 25 t/ha).

**Table 745:** Plant emergence (%), marketable, non-marketable and total tuber yield (t/ha)

Treatment	Potato Crop				Sequential crop	
	Emergence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Non-Mkt yield (t/ha)	Emergence (%)	Total yield (t/ha)
T1	93.79	21.00	17.59	3.41	90.65	10.15
T2	95.44	36.07	30.95	5.12	93.48	16.04
T3	95.20	29.30	25.85	3.46	91.90	11.75
T4	96.42	33.76	29.10	4.66	92.25	13.26
T5	95.66	31.40	27.56	3.84	92.20	12.58
SEd	2.85	1.50	1.45	0.32	1.26	1.09
CD(0.05)	NS	3.30	3.19	0.70	NS	2.39
CV %	4.23	6.99	7.82	10.97	1.93	12.05

**Table 746:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns* (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	21.00	25000	0	38699	63699	126000	6000	62301	0.98
T2	36.07	25000	6645	42199	73844	216420	6000	142576	1.93



T3	29.30	25000	800	38699	64499	175800	6000	111301	1.73
T4	33.76	25000	800	42199	67999	202560	6000	134561	1.98
T5	31.40	25000	800	51199	76999	188400	6000	111401	1.45

## JORHAT

Fourth treatment (Crop residue based: compositing of available cheaper crop/weed residues (like NADEP method) + Crop residue incorporation (Main crop/catch/green manuring/bio-fumigation crop) + biofertilizer (*Azotobacter* and *Phosphobacteria*) + microbial culture to decompose crop residues along with FYM @ 25 tons/hectare) recorded significantly higher yield over inorganic and other organic treatments. This treatment also resulted in highest net returns of Rs. 2,02,385/- per hectare.

**Table 747:** Plant emergence (%), marketable, non-marketable & total tuber yield (t/ha) and grain & straw yield of rice (t/ha)

Treatment	Potato				Rice	
	Emergence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Non-mkt yield (t/ha)	Mkt yield of grain yield (t/ha)	Non-mkt yield of straw (t/ha)
T1	96.56	9.27	6.66	2.61	4.10	5.51
T2	95.63	20.79	17.00	3.78	4.00	5.63
T3	94.22	16.87	13.59	3.28	4.20	6.35
T4	93.44	22.27	18.64	3.64	4.97	7.37
T5	97.50	21.66	18.11	3.54	4.46	7.00
SEd	1.29	0.25	0.23	0.22	0.25	0.20
CD(0.05)	2.84	0.54	0.50	0.48	0.54	0.44
CV %	1.91	1.91	2.15	9.12	7.98	4.47

**Table 748:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns* (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	13.95	51700	0	28100	79800	160425	11500	80625	1.01
T2	25.36	51700	11860	28100	91660	291640	11500	199980	2.18
T3	21.79	51700	9350	28100	89150	250585	11500	161435	1.81
T4	28.07	51700	40620	28100	120420	322805	11500	202385	1.68
T5	26.93	51700	84350	28100	164150	309695	11500	145545	0.89

## PASIGHAT

At Pasighat conditions, as compared to absolute control and standard inorganic package of practices, maximum yield of 26.92 t/ha was produced from organic treatment of Crop residue based: compositing of available cheaper crop/weed residues (like NADEP method) + Crop residue incorporation (Main crop/catch/green manuring/bio-fumigation crop) + biofertilizer (*Azotobacter* and *Phosphobacteria*) + microbial culture to decompose crop residues along with vermicompost application @ 7.5 t/ha.

**Table 749:** Initial soil fertility status of the experimental plot.

Treatments	Soil texture	OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
T1	Loamy sand	2.00	6.10	327.50	35.00	157.00
T2		2.10	6.00	329.00	33.00	158.00
T3		2.10	6.00	328.00	34.00	157.00
T4		2.10	6.10	328.50	34.00	157.00
T5		2.00	6.10	329.00	35.00	157.00

\*= Organic carbon content of soil.

**Table 750:** Plant emergence (%), morphological traits, marketable yield, non-marketable yield and total tuber yield (t/ha)

Treatment	Emergence (%)	Total yield (t/ha)	Mkt yield (t/ha)	Non-Mkt yield (t/ha)
T1	92.22	19.38	18.18	1.20
T2	93.06	30.30	28.69	1.62
T3	93.33	24.35	23.25	1.10
T4	92.78	26.46	25.10	1.37
T5	95.56	28.30	26.92	1.38
SEd	1.79	0.72	0.78	0.29
CD(0.05	NS	1.58	1.71	NS
CV %	2.71	3.93	4.49	31.22

## AGRON. 9: DEVELOPMENT OF MICRONUTRIENT FORMULATION FOR POTATO

The experiments was carried out at 16 locations, namely Bhubaneshwar, Chhindwara, Dessa, Dholi, Faizabad, Hisar, Jalandhar, Jorhat, Kalyani, Kanpur, Modipuram, Pantnagar, Pasighat, Patna, Pune and Raipur.

**Table 751:** Experimental and treatments details at different locations.

Center	Year	Design	Rep	Gross plot size (m <sup>2</sup> )	Net plot size (m <sup>2</sup> )	Variety	Spacing (cm)	Date of Planting	Date of Haulm cutting	Date of Harvesting
BHN	2016-17	RBD	4	10.80	9.00	K Surya	60x20	21.11.16	30.01.17	05.02.17
CHN	2016-17	RBD	4	17.28	12.96	K.Chip-3	60x20	09.11.16	22.02.17	02.03.17
DES	2016-17	RBD	4	16.00	12.00	K Badshah	50x20	17.11.16	26.02.17	26.02.17
DHL	2016-17	RBD	4	19.20	12.96	K Ashoka	60x20	11.11.16	28.02.17	16.03.17
FZB	2016-17	RBD	4	19.20	12.96		60x20	20.11.16	24.02.17	04.03.17
HIS	2016-17	RBD	4	19.20	12.96	K Bahar	60x20	27.10.16	04.02.17	13.02.17
JAL	2016-17	RBD	4	22.88	15.60	K Pukhraj	65x20	19.10.16	16.01.17	28.02.17
JRH	2016-17	RBD	4	19.20	12.96	HPS/II-67	60x20	16.11.16	15.02.17	22.02.17
KAL	2016-17	RBD	4	12.25	9.00	K Jyoti	60x20	28.11.16	21.02.17	04.03.17
KAN	2016-17	RBD	4	19.20	12.96	K Bahar	60x20	27.10.16	26.02.17	27.03.17
MDP	2016-17	RBD	4	10.80	7.20	K Garima	60x20	22.10.16	02.02.17	14.02.17
PNT	2016-17	RBD	3	16.80	12.96	K Surya	60x20	25.10.16	13.02.17	25.02.17
PAS	2016-17	RBD	4	19.20	12.96	K Pushkar	60x20	31.10.16	30.01.17	05.02.17
PAT	2016-17	RBD	4	14.40	10.80	K Pukhraj	60x20	10.11.16	04.02.17	24.02.17
PUN	2016-17	RBD	4	12.96	9.00	K Surya	60x20	07.11.16	08.02.17	15.02.17
RPR	2016-17	RBD	4	19.20	12.96	K Pukhraj	60x20	13.11.16	11.02.17	18.02.17

### Treatments

Treatment	Treatment
T1	: Recommended fertilization practices followed in the region
T2	: T1+ Foliar spray of boron as per details given below
T3	: T1+ Foliar spray of zinc as per details given below
T4	: T1+ Foliar spray of zinc + boron as per details given below
T5	: T1 + Foliar vegetable special of IIHR, Three sprays at different growth stages
T6	: T1 + Potato Specific nutrient formulation, Three sprays at different growth stages

**Spray schedule:** Spray schedule is common to all the treatments

First spray	: Plant establishment stage(Vegetative growth stage)
Second spray	: Tuber initiation stage
Third spray	: Tuber bulking stage

If the duration of variety exceeds 80 days then one more spray can be given between second and third stage of the crop

### BHUBANESHWAR

Recommended fertilization practices for variety Kufri Surya at Bhubaneshwar region and three sprays at three different growth stages (plant establishment , tuber initiation and tuber bulking) of foliar vegetable special of IIHR produced significantly higher tuber yield (26.1 t/ha) with maximum no of tubers (7,10,556). The same treatment gave maximum net return (Rs. 91,300) with highest B:C ratio (0.78).

**Table 752:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Total	Dry matter content (%)
		0-25g	25-50g	50-75g	>75g			
T1	93.33	1.27	5.62	6.99	5.10	18.98	15.88	

T2	94.15	1.16	7.02	8.57	7.19	23.94	16.00
T3	95.43	1.85	5.51	9.13	6.84	23.33	15.88
T4	92.90	1.92	8.14	9.10	5.61	24.77	15.97
T5	93.33	1.67	6.10	10.65	7.68	26.10	17.12
T6	92.50	1.57	5.14	7.15	6.28	20.14	17.00
SEd	3.06	0.09	0.31	0.59	0.29	0.68	0.20
CD(0.05)	NS	0.19	0.67	1.27	0.62	1.47	0.42
CV%	4.62	7.82	7.01	9.72	6.28	4.23	1.70

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	118889	166389	184445	60556	530278	3.02	0.49
T2	108611	208056	229445	86389	632500	3.83	0.48
T3	168333	165000	246111	81111	660556	3.71	0.54
T4	182500	212222	245000	68333	708056	3.96	0.46
T5	154722	179445	285555	90833	710556	4.47	0.55
T6	146944	155278	195834	74722	572778	3.42	0.42
SEd	5599	13583	16203	2332	18651	0.13	0.02
CD(0.05)	12042	29215	34850	5015	40117	0.28	0.04
CV%	5.40	10.61	9.92	4.28	4.15	0.13	0.02

**Table 753:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	18.98	50000	11400	54000	115400	151840	8000	36440	0.32
T2	23.94	50000	11600	55200	116800	191520	8000	74720	0.64
T3	23.33	50000	12000	55200	117200	186640	8000	69440	0.59
T4	24.77	50000	12300	55200	117500	198160	8000	80660	0.69
T5	26.10	50000	12300	55200	117500	208800	8000	91300	0.78
T6	20.14	50000	12300	55200	117500	201501	10005	84001	0.71

## CHHINDWARA

Recommended fertilization practices of Chhindwara region for variety Kufri Chipsona-3 along three sprays at three different growth stages of potato specific formulations produced higher tuber yield (29.38 t/ha) which was at par with other treatments. The same treatments recorded maximum dry matter content (20.58 %) and number of tubers (3, 63,426). Maximum net return (Rs. 87,850) and B:C ratio (1.19) was also recorded from the same treatment.

**Table 754:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha) and tuber uniformity (1-5 scale)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
		0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	90.85	2.20	6.52	7.16	8.13	24.00	18.93	4.54	1.53
T2	91.83	2.46	7.19	7.34	8.39	25.37	19.03	4.82	1.60
T3	94.75	2.89	7.47	8.31	8.76	27.42	18.88	5.17	1.13
T4	95.09	3.04	7.72	8.32	9.01	28.09	19.40	5.45	1.10
T5	92.20	3.76	7.65	8.52	9.02	28.94	19.98	5.78	1.11
T6	91.34	3.83	8.02	8.79	8.75	29.38	20.58	5.97	1.11
SEd	1.21	0.16	0.29	0.25	0.39	0.44	0.32	0.14	0.09
CD(0.05)	2.60	0.34	0.62	0.54	NS	0.95	0.68	0.30	0.20
CV%	1.84	7.43	5.49	4.36	6.37	2.30	2.30	3.69	10.27

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Tuber uniformity (1-5 scale)	
	0-25g	25-50g	50-75g	>75g	Total	Colour	Shape
T1	91628	77546	68866	34722	272763	3.00	3.00
T2	94329	84491	79668	36458	294946	3.25	3.25
T3	97608	86420	88542	36844	309414	3.25	3.25
T4	105903	107639	88349	37037	338928	3.50	4.50
T5	109182	113812	93943	40316	357253	4.75	4.75
T6	113426	117284	88349	44367	363426	4.75	5.00
SEd	7588	11642	10275	7083	21883	0.55	0.49
CD(0.05)	NS	25041	NS	NS	47069	1.19	1.05
CV%	10.52	16.82	17.17	26.16	9.59	20.85	17.41

**Table 755:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	24.00	35000	8740	28950	72690	132000	5500	59310	0.82
T2	25.37	35000	9740	30000	74740	139535	5500	64795	0.87
T3	27.42	35000	10230	30000	75230	150810	5500	75580	1.00
T4	28.09	35000	11230	30000	76230	154495	5500	78265	1.03
T5	28.94	35000	8740	30000	73740	159170	5500	85430	1.16
T6	29.38	35000	8740	30000	73740	161590	5500	87850	1.19

**DEESA**

Three foliar sprays at three different growth stages of foliar vegetable special of IHR along with recommended fertilization practices for variety Kufri Badshah at Dessa produced maximum tuber yield (37.39 t/ha), however it was at par with rest of the other treatments.

**Table 756:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha) and tuber uniformity (1-5 scale)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)	Tuber yield on dry weight basis (t/ha)
		0-25g	25-50g	50-75g	>75g	Total		
T1	90.36	1.17	4.28	15.34	14.49	35.27	19.05	6.71
T2	91.01	0.87	4.55	15.57	15.43	36.41	19.34	7.04
T3	92.05	0.77	5.06	13.20	17.40	36.43	19.67	7.18
T4	90.40	0.98	5.80	12.91	16.02	35.70	20.34	7.26
T5	92.00	1.11	5.08	14.29	16.92	37.39	20.30	7.58
T6	91.72	1.12	4.90	15.73	14.52	36.27	18.66	6.78
SEd	NS	0.25	NS	2.16	2.03	NS	NS	NS
CD(0.05)	1.34	0.11	0.52	1.00	0.94	1.65	0.70	0.42
CV%	2.07	16.11	14.82	9.77	8.44	6.45	5.06	8.32

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Tuber uniformity (1-5 scale)	
	0-25g	25-50g	50-75g	>75g	Total	Colour	Shape
T1	91042	102500	234167	140209	567917	4.00	4.00
T2	66250	105417	242500	147500	561666	4.19	4.19
T3	56250	122500	205833	163542	548125	4.19	4.14
T4	76042	138125	193125	156250	563541	4.13	4.19
T5	82500	123125	222500	164167	592291	4.26	4.25
T6	80209	124792	244792	140000	589791	4.25	4.31
SEd	18008	21806	34204	17832	NS	NS	NS
CD(0.05)	8372	10138	15902	8291	21905	0.23	0.20
CV%	15.71	12.01	10.05	7.72	5.43	7.80	6.72

## DHOLI

Foliar spray of zinc alone at three different crop stages along with recommended fertigation practices for Dholi region produced maximum tuber yield of 18.68 t/ha; however this yield was at par with yield produced by spray of potato specific formulation (18.38 t/ha) and spray of foliar vegetable special of IHR (18.34 t/ha). Net return (Rs. 76,240) and B:C ratio (1.08) was optimum with treatment of foliar application of IHR foliar special.

**Table 757:** Plant emergence (%) and grade-wise yield (t/ha)

Treatment	Emergence (%)	Grade-wise yield (t/ha)				
		0-25g	25-50g	50-75g	>75g	Total
T1	99.25	2.65	3.42	3.51	4.11	13.70
T2	98.55	2.16	2.61	4.48	6.41	15.65
T3	98.13	1.86	2.34	4.86	6.70	15.75
T4	98.78	1.43	2.11	6.12	9.04	18.68
T5	99.00	1.36	1.88	6.41	8.71	18.34
T6	98.50	1.22	1.60	6.45	9.11	18.38
SEd	0.68	0.13	0.18	0.29	0.27	0.45
CD(0.05)	NS	0.28	0.39	0.62	0.58	0.97
CV%	0.98	10.16	11.01	7.69	5.15	3.81

**Table 758:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	13.70	30000	4800	36000	70800	109600	8000	38800	0.55
T2	15.65	30000	5200	36000	71200	125200	8000	54000	0.76
T3	15.75	30000	5200	36000	71200	126000	8000	54800	0.77
T4	18.68	30000	5800	36000	71800	149440	8000	77640	1.08
T5	18.34	30000	4800	36000	70800	146720	8000	75920	1.07
	18.38	30000	4800	36000	70800	147040	8000	76240	1.08

## FAIZABAD

Foliar application of Zinc and Boron together produced maximum tuber yield of 30.27 t/ha; however, it was at par with treatment of potato specific formulation (29.34 t/ha). The same treatment recorded maximum no of 50-75 g and >75 g tubers along with high tuber (5.54 t/ha) and haulm yield (3.60 t/ha) on dry weight basis. And the same treatment had highest net return (Rs. 85,550) with 1.30 B:C ratio.

**Table 759:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Total	Dry matter content (%)
		0-25g	25-50g	50-75g	>75g			
T1	92.36	1.40	6.55	8.45	7.07	23.46	18.21	
T2	92.36	1.53	7.09	9.12	7.59	25.33	18.29	
T3	93.29	1.58	7.38	9.51	7.92	26.40	18.19	
T4	92.13	1.81	8.47	10.90	9.09	30.27	18.33	
T5	92.36	1.74	8.11	10.42	8.69	28.95	18.36	
T6	93.06	1.76	8.20	10.56	8.82	29.34	18.36	
SEd	0.80	0.07	0.31	0.39	0.32	1.09	0.03	
CD(0.05)	NS	0.15	0.67	0.85	0.68	2.34	0.07	
CV%	1.22	5.94	5.73	5.67	5.49	5.64	0.26	

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	93172	186921	135803	79668	495563	4.27	2.78

T2	101273	202161	146798	85841	536073	4.63	3.01
T3	105324	210648	152971	89699	558642	4.80	3.12
T4	120563	241706	175347	103009	640625	5.54	3.60
T5	115548	231096	167438	98187	612269	5.31	3.45
T6	116706	233796	169753	99730	619985	5.39	3.50
SEd	4650	8802	6378	3551	23313	0.20	0.13
CD(0.05)	10001	18931	13718	7637	50143	0.43	0.28
CV%	6.05	5.72	5.71	5.42	5.71	5.64	5.67

**Table 760: Economics**

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	23.46	25000	10800	30000	65800	117300	5000	51500	0.78
T2	25.33	25000	10800	30000	65800	126650	5000	60850	0.92
T3	26.40	25000	10800	30000	65800	132000	5000	66200	1.01
T4	30.27	25000	10800	30000	65800	151350	5000	85550	1.30
T5	28.95	25000	10800	30000	65800	144750	5000	78950	1.20
T6	29.34	25000	10800	30000	65800	146700	5000	80900	1.23

## HISAR

Foliar application of Zinc and Boron together along with recommended fertigation for Hisar region for variety Kufri Badshah produced maximum tuber yield of 19.74 t/ha; however it was at par with rest of the micro-nutrient formulation treatment.

**Table 761: Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha) and tuber uniformity (1-5 scale)**

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
		0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	94.63	4.48	9.87	10.23	14.16	38.74	17.59	6.81	2.17
T2	95.57	4.65	10.60	11.48	15.07	41.79	18.16	7.57	2.72
T3	95.67	4.56	10.83	11.61	16.26	43.26	18.89	8.18	2.94
T4	93.42	4.50	11.49	12.25	17.33	45.56	19.74	8.98	3.79
T5	94.28	4.39	11.42	12.08	16.49	44.37	18.80	8.34	3.45
T6	95.13	3.78	11.58	12.52	17.68	45.56	19.26	8.77	3.78
SEd	3.20	0.43	0.39	0.67	0.96	1.33	0.73	0.39	0.43
CD(0.05)	NS	NS	0.84	1.44	2.06	2.85	NS	0.84	0.92
CV%	4.78	13.71	5.01	8.10	8.38	4.34	5.48	6.78	19.18

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Tuber uniformity (1-5 scale)	
	0-25g	25-50g	50-75g	>75g	Total	Colour	Shape
T1	283179	162230	91435	78125	614969	3.25	2.50
T2	248843	195602	106867	105517	656829	3.50	3.00
T3	271605	199460	110147	111111	692323	3.50	2.75
T4	286844	205440	122492	115741	730517	4.25	3.75
T5	297454	194444	111304	97801	701003	4.00	3.50
T6	275463	207562	129051	121721	733797	4.25	3.50
SEd	23700	9829	6801	7179	29783	0.43	0.53
CD(0.05)	NS	21140	14627	15441	64060	NS	NS
CV%	12.09	7.16	8.60	9.67	6.12	15.91	23.77

## JALANDHAR

Recommended package of fertigation and foliar spray of Boron produced maximum tuber yield of 34.07 t/ha.

**Table 762:** Plant emergence (%), grade-wise yield (t/ha), tuber & haulm yield on dry weight basis (t/ha), number of tubers (000'/ha) and dry matter content (%).

Treatment	Emergence (%)	Grade-wise yield (t/ha)					Grade-wise number of tubers (no/ha)				
		0-25g	25-50g	50-75g	>75g	Total	0-25g	25-50g	50-75g	>75g	Total
T1	86.75	3.37	4.99	6.12	17.57	32.04	134135	106250	88462	107692	436539
T2	96.00	3.61	5.22	6.33	18.91	34.07	157372	112821	92629	117949	480769
T3	88.00	3.24	5.26	6.25	16.84	31.59	142148	111378	88301	102404	444231
T4	89.00	3.54	5.64	6.44	15.90	31.52	134135	115064	94552	106250	450000
SEd	NS	NS	NS	NS	NS	NS	5930	4691	3205	8586	6464
CD(0.05)	5.37	0.26	0.37	0.44	2.17	2.15	13605	NS	NS	NS	14829
CV%	8.44	10.88	9.80	9.91	17.75	9.42	5.91	5.96	4.98	11.18	2.02

**Table 763:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	32.04	35000	13000	68000	116000	128160	4000	12160	0.10
T2	34.07	35000	13200	68500	116700	136280	4000	19580	0.17
T3	31.59	35000	13200	68500	116700	126360	4000	9660	0.08
T4	31.52	35000	13400	68500	116900	126080	4000	9180	0.08

#### JORHAT

Potato specific formulation produced significantly highest tuber yield on spray of potato specific formulation + recommended fertigation for jorhat region (29.88 t/ha) followed by 23.77 t/ha tuber yield from spray of Foliar special of IIHR (23.77 t/ha). The same treatment had maximum dry matter content in tuber (21.15 %) and haulm (13.43 %). Net return and B:C ratio followed the same trend.

**Table 764:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha) and tuber uniformity (1-5 scale)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)		
		0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm	
T1	96.68	1.27	6.30	5.23	4.27	17.06	17.25	11.30	
T2	96.50	1.22	6.45	5.13	4.46	17.26	18.00	11.65	
T3	96.55	1.10	7.30	4.76	6.66	19.81	19.19	12.40	
T4	96.85	1.37	7.55	6.43	6.45	21.79	19.65	12.98	
T5	97.15	1.94	7.74	8.20	5.90	23.77	20.49	13.22	
T6	97.60	1.87	7.97	9.44	10.60	29.88	21.15	13.43	
SEd	0.89	0.34	1.11	0.68	1.28	0.60	0.33	0.23	
CD(0.05)	NS	NS	NS	1.47	2.75	1.28	0.71	0.50	
CV%	1.31	32.97	21.69	14.78	28.26	3.91	2.42	2.61	

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)		Tuber uniformity (1-5 scale)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm	Colour	Shape
T1	228202	183063	74267	31443	508681	2.48	1.26	4.00	3.00
T2	186150	214699	75425	37809	513696	3.17	1.40	4.00	3.00
T3	236497	210841	97415	51312	615355	3.72	1.60	4.00	3.00
T4	226273	228395	111497	49769	615934	4.17	1.69	4.00	3.00
T5	214699	187307	123650	48032	573688	4.35	1.74	4.00	3.00
T6	149692	261767	147570	60764	619792	4.68	2.00	4.00	3.00
SEd	15158	19862	3852	2503	11217	0.25	0.06	0.00	0.00
CD(0.05)	32604	42721	8285	5385	24127	0.54	0.13	NS	NS
CV%	10.36	13.11	5.19	7.61	2.76	9.44	5.45	0.10	0.13



**Table 765: Economics**

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	17.06	50000	11582	16840	78422	204720	12000	126298	1.61
T2	17.26	50000	11582	20080	81662	207120	12000	125458	1.54
T3	19.81	50000	11582	20080	81662	237720	12000	156058	1.91
T4	21.79	50000	11582	23320	84902	261480	12000	176578	2.08
T5	23.77	50000	11582	20080	81662	285240	12000	203578	2.49
T6	29.88	50000	11582	20080	81662	358560	12000	276898	3.39

**KALYANI**

The result of the experiment revealed that application of boron alone or in combination with zinc along with RDF had a significant effect on potato tuber yield. The highest tuber yield (33.27 t/ha) of Kufri Jyoti was obtained with the application of RDF+ Potato specific nutrient formulation at three different growth stages and it was significantly higher than all other treatments followed by application of RDF+ Foliar vegetable of IIHR at three different growth stages which was found at par with the application of RDF+ foliar spray of zinc (ZnSO<sub>4</sub>.7H<sub>2</sub>O at 150 ppm)+ boron (boric acid at 50 ppm) at three different growth stages. Also application of boron alone or in combination with zinc and foliar vegetable special of IIHR and potato specific nutrient formulation improved the colour and shape of the tubers significantly over the application of RDF alone or in combination with zinc only.

**Table 766: Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha) and tuber uniformity (1-5 scale)**

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Yield on dry weight basis (t/ha)	
		0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	99.43	0.69	2.23	3.89	16.06	22.86	4.42	2.83
T2	99.40	0.82	2.72	4.61	18.22	26.37	5.09	3.22
T3	98.53	0.72	2.48	4.34	16.86	24.38	4.75	2.89
T4	99.88	0.87	2.97	5.08	20.14	29.06	5.64	4.08
T5	99.58	0.89	2.94	5.25	20.72	29.80	5.69	4.31
T6	99.55	0.91	3.50	5.97	22.89	33.27	6.28	4.64
SEd	0.71	0.09	0.34	0.45	0.91	1.34	0.27	0.23
CD(0.05)	NS	NS	0.74	0.97	1.97	2.89	0.58	0.50
CV%	1.02	15.10	17.28	13.07	6.75	6.88	7.19	9.05

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Tuber uniformity (1-5 scale)	
	0-25g	25-50g	50-75g	>75g	Total	Colour	Shape
T1	53611	60556	73889	96389	284445	4.25	3.25
T2	54167	69167	72778	102222	298333	5.00	5.00
T3	52778	67778	70834	100000	291389	4.00	4.00
T4	54445	69445	76945	108333	309167	4.75	5.00
T5	60278	74167	72500	105556	312500	5.00	5.00
T6	52778	72222	71945	112222	309167	4.75	4.75
SEd	2912	2633	4057	3527	6254	0.22	0.22
CD(0.05)	NS	5664	NS	7586	13452	0.47	0.48
CV%	7.53	5.41	7.84	4.79	2.94	6.74	7.03

**KANPUR**

Recommended fertigation and three foliar spray of potato specific formulation at three different growth stages produced significantly higher yield (32.87 t/ha) over other nutrient formulations. The same spray recorded highest yield on dry weight basis for tuber (2.78 t/ha) and haulm (2.32 t/ha), maximum net return (Rs. 66,250) and B:C ratio (0.68) in variety Kufri Bahar.

**Table 767:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha) and tuber uniformity (1-5 scale)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
		0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	96.08	4.03	6.41	9.13	10.52	30.09	17.03	2.38	1.76
T2	96.15	3.77	6.66	8.65	10.48	29.55	16.98	2.52	1.82
T3	95.90	3.94	6.47	9.15	10.62	29.78	18.35	2.64	1.83
T4	97.30	3.88	6.81	9.11	10.79	30.48	18.30	2.57	1.90
T5	96.88	4.11	6.41	8.90	10.89	30.30	17.35	2.67	2.01
T6	97.73	4.46	7.18	9.96	11.29	32.87	17.33	2.78	2.32
SEd	0.78	0.29	0.14	0.37	0.25	0.58	0.23	0.05	0.05
CD(0.05)	NS	NS	0.30	NS	NS	1.25	0.50	0.11	0.11
CV%	1.14	10.14	2.97	5.77	3.29	2.69	1.85	2.81	3.62

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Tuber uniformity (1-5 scale)	
	0-25g	25-50g	50-75g	>75g	Total	Colour	Shape
T1	238233	225502	152199	124614	740548	3.63	3.63
T2	227430	229167	147184	124422	728202	4.00	3.63
T3	233604	231481	147377	124807	737269	4.25	4.13
T4	233604	230710	150077	127508	752315	4.38	4.25
T5	244792	232253	151042	128087	756173	4.38	3.88
T6	256173	270834	164545	131752	824074	4.63	4.63
SEd	10959	7627	3341	3377	18924	0.30	0.36
CD(0.05)	NS	16405	7186	NS	40703	NS	NS
CV%	6.49	4.56	3.11	3.76	3.54	9.94	12.69

**Table 768:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	30.09	40000	11000	41000	92000	150450	5000	58450	0.64
T2	29.55	40000	12000	45000	97000	147750	5000	50750	0.52
T3	29.78	40000	12100	45000	97100	148900	5000	51800	0.53
T4	30.48	40000	12150	45000	97150	152400	5000	55250	0.57
T5	30.30	40000	13000	45000	98000	151500	5000	53500	0.55
T6	32.87	40000	13100	45000	98100	164350	5000	66250	0.68

## MODIPURAM

Three spray of Boron and recommended fertigation practice for Modipuram region for variety Kufri Garima produced maximum yield (51.81 t/ha); however it was at par with other micronutrient formulation application treatments. The various micro nutrient formulation had no significant effect on plant emergence, dry matter content, tuber and haulm yield on dry weight basis. The same trend was observed for net return and B:C ratio. It indicated that at Modipuram conditions, spray of micronutrient formulation had little or no effect on overall plant

**Table 769:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha) and tuber uniformity (1-5 scale)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
		0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	95.42	2.08	9.52	11.84	28.27	51.71	16.96	8.77	1.93
T2	93.33	1.95	10.63	11.04	28.20	51.81	16.86	8.73	1.93

T3	92.08	1.88	8.72	8.86	30.66	50.11	16.97	8.50	1.85
T4	92.50	1.67	7.78	11.67	28.41	49.52	17.02	8.42	2.03
T5	91.67	2.12	8.68	11.29	29.38	51.46	17.03	8.76	1.88
T6	92.92	2.26	9.06	11.74	27.57	50.63	16.96	8.58	1.91
SEd	2.18	0.39	2.11	1.27	2.70	1.19	0.76	0.34	0.18
CD(0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS
CV%	3.31	27.38	32.92	16.20	13.27	3.30	6.35	5.61	13.23

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Tuber uniformity (1-5 scale)	
	0-25g	25-50g	50-75g	>75g	Total	Colour	Shape
T1	132639	165972	125000	135764	559375	4.00	4.00
T2	145833	173264	106597	134375	560070	4.00	4.00
T3	111111	152778	88195	129861	481945	4.00	4.00
T4	110417	163889	107292	135764	517361	4.00	4.00
T5	132986	167361	103819	136806	540972	4.00	4.00
T6	152778	170139	110417	142361	575695	4.00	4.00
SEd	6498	10071	7574	9196	10990	0.00	0.00
CD(0.05)	13976	NS	16291	NS	23638	NS	NS
CV%	7.02	8.60	10.02	9.58	2.88	0.10	0.10

**Table 770:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	51.71	48000	16200	50133	114333	232695	4500	118362	1.04
T2	51.81	48000	17200	51633	116833	233145	4500	116312	1.00
T3	50.11	48000	17200	51633	116833	225495	4500	108662	0.93
T4	49.52	48000	17200	51633	116833	222840	4500	106007	0.91
T5	51.46	48000	17200	51633	116833	231570	4500	114737	0.98
T6	50.63	48000	17200	51633	116833	227835	4500	111002	0.95

## PANTNAGAR

Three foliar spray of Zinc and Boron together along with recommended fertigation produced significantly higher tuber yield of 34.49 t/ha for variety Kufri Surya followed by treatment of three foliar spray of zinc only (33.54 t/ha). It indicated that, foliar application of zinc has contributed for increased tuber yield at pantnagar conditions.

**Table 771:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)
		0-25g	25-50g	50-75g	>75g	Total	
T1	98.34	1.76	8.72	8.62	13.72	32.82	19.27
T2	98.61	1.73	8.31	9.11	13.74	32.89	18.00
T3	98.33	1.94	8.39	9.60	13.61	33.54	18.49
T4	97.78	1.69	9.70	10.55	12.56	34.49	18.54
T5	98.06	1.44	9.86	9.26	10.94	31.50	19.31
T6	99.44	1.36	8.88	9.19	13.12	32.55	17.28
SEd	0.88	0.04	0.17	0.18	0.30	0.30	0.97
CD(0.05)	NS	0.10	0.38	0.42	0.68	0.67	NS
CV%	1.09	3.29	2.31	2.40	2.87	1.10	6.46

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	112397	137346	95936	88992	434671	6.33	2.92
T2	80504	143519	89763	81276	395062	5.92	2.69

T3	88220	137860	84620	86934	397634	6.20	2.90
T4	81276	119342	92850	82562	376029	6.40	2.48
T5	112654	163323	119856	81018	476852	6.08	2.30
T6	91821	165123	92850	70216	420010	5.62	2.29
SEd	1160	837	1533	1340	2719	0.32	0.12
CD(0.05)	2618	1890	3460	3024	6136	NS	0.27
CV%	1.50	0.71	1.96	2.01	0.80	6.48	5.63

### PASIGHAT

29.32 t/ha of tuber yield was obtained by three spray of foliar vegetable special of IIHR + recommended fertigation practices for pasighat region for variety Kufri Pushkar; which was significantly higher over other formulation sprays.

**Table 772:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber uniformity (1-5 scale)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)
		0-25g	25-50g	50-75g	>75g	Total	
T1	81.39	5.40	5.65	6.36	4.53	21.93	19.82
T2	82.50	5.82	5.33	6.46	5.36	22.97	20.41
T3	80.28	5.47	4.50	5.37	6.76	22.09	18.54
T4	84.72	5.94	6.33	7.10	6.07	25.44	19.63
T5	82.78	6.39	7.99	8.03	6.91	29.32	20.78
SEd	1.16	0.35	0.42	0.63	0.68	1.19	0.69
CD(0.05)	2.56	NS	0.93	1.38	1.49	2.62	NS
CV%	1.99	8.62	9.96	13.33	16.11	6.92	4.94

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Tuber uniformity (1-5 scale)	
	0-25g	25-50g	50-75g	>75g	Total	Colour	Shape
T1	315587	135803	98573	52662	602624	4.08	4.10
T2	338735	129823	101273	57678	624035	4.10	4.18
T3	319830	106867	85648	78704	574557	4.05	4.10
T4	347030	151620	112461	62404	817130	4.18	4.20
T5	368442	183256	125579	79090	756366	4.15	4.25
SEd	19729	11395	9897	6916	97430	0.06	0.05
CD(0.05)	NS	25103	21803	15235	NS	NS	NS
CV%	8.26	11.39	13.37	14.80	20.42	1.90	1.75

### PATNA

Three spray of foliar vegetable special of IIHR along with recommended fertigation practices for variety Kufri Pukhraj produced significantly higher tuber yield (38.57 t/ha) followed by three spray of Boron and zinc together + recommended fertigation practice (36.63 t/ha).

**Table 773:** Plant emergence (%) and grade-wise yield (t/ha)

Treatment	Emergence (%)	Grade-wise yield (t/ha)				
		0-25g	25-50g	50-75g	>75g	Total
T1	95.75	3.10	6.67	10.10	10.70	30.56
T2	94.50	2.85	7.10	12.32	12.18	34.44
T3	95.00	5.00	6.55	10.12	12.30	33.96
T4	95.25	3.96	8.78	12.83	11.07	36.63
T5	94.75	4.03	8.01	12.80	13.73	38.57
T6	95.25	3.19	6.78	12.69	11.90	34.56
SEd	NS	NS	0.80	1.33	1.23	3.10
CD(0.05)	0.56	0.74	0.37	0.62	0.57	1.44
CV%	0.84	28.52	7.21	7.43	6.73	5.86

## PUNE

Recommended fertilization practices for variety Kufri Surya at Pune region and three sprays at three different growth stages (plant establishment , tuber initiation and tuber bulking) of foliar vegetable special of IIHR produced highest tuber yield (18.43 t/ha) which was at par with potato specific nutrient formulation spray (18.13 t/ha). The same treatment resulted in maximum net return (Rs. 1,57,720) and highest B:C ratio (2.70).

**Table 774:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha) and tuber uniformity (1-5 scale)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
		0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	88.75	1.51	2.41	7.86	4.09	15.86	16.11	3.46	1.37
T2	89.00	1.80	2.74	8.49	4.92	17.94	16.36	4.32	1.39
T3	86.75	1.75	2.65	8.13	4.88	17.39	16.26	3.95	1.58
T4	89.75	1.97	2.82	9.07	5.36	19.22	17.60	4.45	1.81
T5	92.25	2.33	3.54	10.00	5.74	21.61	18.43	5.50	2.16
T6	90.25	2.28	3.22	9.75	5.43	20.68	18.13	5.17	2.00
SEd	0.98	0.04	0.11	0.11	0.16	0.25	0.23	0.13	0.07
CD(0.05)	2.10	0.09	0.23	0.24	0.35	0.54	0.49	0.28	0.15
CV%	1.54	3.04	5.27	1.78	4.49	1.90	1.89	4.10	5.68

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Tuber uniformity (1-5 scale)	
	0-25g	25-50g	50-75g	>75g	Total	Colour	Shape
T1	80278	79445	128334	55000	343056	3.00	3.00
T2	89445	89722	142500	67222	388889	3.50	4.00
T3	86389	86667	137778	64722	375556	3.00	3.00
T4	96667	103889	148889	67778	417222	3.00	4.00
T5	117222	123611	168889	78333	488056	4.00	4.00
T6	109444	112500	163056	70556	455556	4.00	4.00
SEd	3531	3344	3570	2445	7397	0.17	0.00
CD(0.05)	7595	7193	7678	5259	15911	0.36	0.01
CV%	5.17	4.76	3.41	5.14	2.54	6.93	0.15

**Table 775:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	15.86	30000	11580	16800	58380	158600	10000	100220	1.72
T2	17.94	30000	12000	16800	58800	179400	10000	120600	2.05
T3	17.39	30000	12000	16800	58800	173900	10000	115100	1.96
T4	19.22	30000	12871	16800	59671	192200	10000	132529	2.22
T5	21.61	30000	11580	16800	58380	216100	10000	157720	2.70
T6	20.68	30000	11580	16800	58380	206800	10000	148420	2.54

## RAIPUR

Three foliar spray of Zinc and Boron together along with recommended fertigation produced higher tuber yield of 34.49 t/ha for variety Kufri Surya; however it was not significant over rest of the nutrient formulation sprays. The same treatment recorded maximum net return (Rs. 1,15,329) and highest B:C ratio (1.47).

**Table 776:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha) and tuber uniformity (1-5 scale)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
		0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	89.58	3.46	7.55	2.26	2.07	16.21	18.71	3.16	9.83
T2	89.82	4.50	6.91	2.43	1.41	17.08	18.90	3.46	10.22
T3	89.12	5.98	6.62	2.68	2.18	18.38	19.02	3.83	9.83
T4	88.66	6.34	7.07	3.08	2.22	19.38	19.48	4.10	9.80
T5	88.89	4.92	6.00	4.36	1.86	18.39	19.02	3.61	10.60
T6	89.35	4.81	7.56	3.30	1.60	18.64	19.42	3.61	10.70
SEd	1.25	0.54	1.13	0.74	0.53	1.80	0.29	0.42	0.01
CD(0.05)	NS	1.16	NS	NS	NS	NS	NS	NS	0.01
CV%	1.98	15.23	22.89	34.58	39.35	14.14	2.14	14.02	0.06

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Tuber uniformity (1-5 scale)	
	0-25g	25-50g	50-75g	>75g	Total	Colour	Shape
T1	181327	159144	35108	16397	408179	1.33	1.33
T2	205633	133102	36458	12924	419753	3.67	2.67
T3	326389	137346	34529	16782	529707	3.33	1.67
T4	219522	122493	41859	16397	421104	3.67	4.33
T5	247878	125386	54012	13696	466435	1.67	1.67
T6	291088	129051	43210	13117	502122	3.67	3.00
SEd	49430	32865	8318	2639	67877	0.51	0.46
CD(0.05)	NS	NS	NS	NS	NS	1.15	1.05
CV%	28.50	34.58	28.79	25.07	20.96	21.59	23.22

**Table 777:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns* (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
T1	16.21	40000	9154	28792	77946	162100	10000	84154	1.08
T2	17.08	40000	9454	28792	78246	170800	10000	92554	1.18
T3	18.38	40000	9379	28792	78171	183800	10000	105629	1.35
T4	19.38	40000	9679	28792	78471	193800	10000	115329	1.47
T5	18.39	40000	9654	28792	78446	183900	10000	105454	1.34
T6	18.64	40000	9654	28792	78446	186400	10000	107954	1.38

## AGRON. 10: POTASSIUM REQUIREMENT OF POTATO UNDER DIFFERENT IRRIGATION METHODS

Experiments were conducted at Deesa Centre only. The treatments consisted of combination of 2 irrigation methods, 2 KSB (Potassium solubilizing bacteria) levels and 3 levels of potassium. Drip Irrigation produced significantly higher total tuber yield as compared to furrow irrigation. Treatments of KSB also produced significantly higher tuber yield. The potato crop responded up to highest level of Potassium application i.e. 280 kg K<sub>2</sub>O/ha (37.9 t/ha). However, none of the interaction was significant.

**Table 778:** Experimental and treatments details at different locations.

Center	DES		
Year	2016-17	Design	Split-Split Plot
Rep	3	Spacing (cm)	50 x 20
Gross plot size (m <sup>2</sup> )	18.0	Date of Planting	18.11.16
Net plot size (m <sup>2</sup> )	12.0	Date of Haulm cutting	14.03.17
Variety	K Pukhraj	Date of Harvesting	14.03.17
Recommended dose of N: P: K (kg/ha)	275-140 (furrow); 220-110 (drip)		

### Treatments

#### Main plot: Irrigation methods

M<sub>1</sub>: Drip irrigation

M<sub>2</sub>: Furrow irrigation

#### Sub-plot: KSB treatment

K<sub>1</sub>: No treatment of KSB (Potassium solubilizing bacteria)

K<sub>2</sub>: Treatment with KSB (tuber treatment)

#### Sub-sub-plot: K levels

S<sub>1</sub>: 140 kg K<sub>2</sub>O/ha

S<sub>2</sub>: 210 kg K<sub>2</sub>O/ha

S<sub>3</sub>: 280 kg K<sub>2</sub>O/ha

**Table 779:** Main & interaction effects of irrigation methods, KSB treatment and K levels on plant emergence (%), grade-wise yield (t/ha), dry matter content (%) and tuber yield on dry weight basis (t/ha)

Emergence (%)															
Irrigation methods X KSB treatment				Irrigation methods X K levels					KSB treatment X K levels						
	K1	K2	Mean M		S1	S2	S3	Mean M		S1	S2	S3	Mean M		
M1	91.25	90.84	91.05	M1	90.53	90.94	91.67	91.05	K1	90.42	91.05	89.90	90.46		
M2	89.66	90.35	90.00	M2	89.59	90.73	89.69	90.00	K2	89.69	90.63	91.46	90.59		
Mean K	90.46	90.59		Mean S	90.06	90.84	90.68		Mean S	90.06	90.84	90.68			
Irrigation methods X KSB treatment X K levels				Factors											
	M1		M2		Irrigation methods					CD 5%				SE(d)	SE(m)
	K1	K2	K1	K2	KSB treatment					NS				0.88	0.63
S1	91.05	90.00	89.79	89.38	Irrigation methods X KSB treatment					NS				1.25	0.88
S2	91.46	90.42	90.63	90.83	K levels					NS				1.08	0.77
S3	91.25	92.09	88.55	90.84	Irrigation methods X K levels					NS				1.53	1.08
					KSB treatment X K levels					NS				1.53	1.08
					Irrigation methods X KSB treatment X K levels					NS				2.17	1.53
Plant height (cm)															
Irrigation methods X KSB treatment				Irrigation methods X K levels					KSB treatment X K levels						
	K1	K2	Mean M		S1	S2	S3	Mean M		S1	S2	S3	Mean M		
M1	50.43	48.52	49.47	M1	47.86	49.53	51.03	49.47	K1	44.77	48.27	50.39	47.81		
M2	45.19	45.20	45.20	M2	41.20	47.16	47.23	45.20	K2	44.28	48.42	47.87	46.86		
Mean K	47.81	46.86		Mean S	44.53	48.35	49.13		Mean S	44.53	48.35	49.13			
Irrigation methods X KSB treatment X K levels				Factors											
	M1		M2		Irrigation methods					CD 5%				SE(d)	SE(m)
	K1	K2	K1	K2	KSB treatment					NS				1.16	0.82

	K1	K2	K1	K2	KSB treatment				NS	0.88	0.62		
S1	48.92	46.80	40.62	41.77	Irrigation methods X KSB treatment				NS	1.25	0.88		
S2	50.08	48.98	46.45	47.87	K levels				2.25	1.08	0.76		
S3	52.28	49.77	48.50	45.96	Irrigation methods X K levels				NS	1.53	1.08		
					KSB treatment X K levels				NS	1.53	1.08		
					Irrigation methods X KSB treatment X K levels				NS	2.16	1.53		
<b>No. of shoots/plant</b>													
<b>Irrigation methods X KSB treatment</b>				<b>Irrigation methods X K levels</b>					<b>KSB treatment X K levels</b>				
	K1	K2	Mean M		S1	S2	S3	Mean M		S1	S2	S3	Mean M
M1	3.15	3.27	3.21	M1	3.19	3.15	3.29	3.21	K1	2.81	2.60	2.64	2.68
M2	2.22	2.51	2.36	M2	2.31	2.05	2.73	2.36	K2	2.69	2.61	3.37	2.89
Mean K	2.68	2.89		Mean S	2.75	2.60	3.01		Mean S	2.75	2.60	3.01	
<b>Irrigation methods X KSB treatment X K levels</b>				<b>Factors</b>					<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>		
		M1		M2		Irrigation methods				NS	0.25	0.18	
		K1	K2	K1	K2	KSB treatment				NS	0.29	0.21	
S1	3.34	3.04	2.29	2.34	Irrigation methods X KSB treatment				NS	0.42	0.29		
S2	3.00	3.30	2.19	1.91	K levels				NS	0.36	0.26		
S3	3.11	3.47	2.17	3.28	Irrigation methods X K levels				NS	0.51	0.36		
					KSB treatment X K levels				NS	0.51	0.36		
					Irrigation methods X KSB treatment X K levels				NS	0.72	0.51		
<b>Yield of tubers 0-25g (t/ha)</b>													
<b>Irrigation methods X KSB treatment</b>				<b>Irrigation methods X K levels</b>					<b>KSB treatment X K levels</b>				
	K1	K2	Mean M		S1	S2	S3	Mean M		S1	S2	S3	Mean M
M1	1.26	1.11	1.19	M1	1.40	1.13	1.04	1.19	K1	1.16	0.81	0.88	0.95
M2	0.63	0.59	0.61	M2	0.82	0.56	0.46	0.61	K2	1.06	0.88	0.62	0.85
Mean K	0.95	0.85		Mean S	1.11	0.84	0.75		Mean S	1.11	0.84	0.75	
<b>Irrigation methods X KSB treatment X K levels</b>				<b>Factors</b>					<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>		
		M1		M2		Irrigation methods				0.35	0.08	0.06	
		K1	K2	K1	K2	KSB treatment				NS	0.06	0.05	
S1	1.37	1.43	0.94	0.70	Irrigation methods X KSB treatment				NS	0.09	0.06		
S2	1.12	1.13	0.50	0.62	K levels				0.16	0.08	0.06		
S3	1.29	0.78	0.46	0.45	Irrigation methods X K levels				NS	0.11	0.08		
					KSB treatment X K levels				NS	0.11	0.08		
					Irrigation methods X KSB treatment X K levels				NS	0.16	0.11		
<b>Yield of tubers 25-50g (t/ha)</b>													
<b>Irrigation methods X KSB treatment</b>				<b>Irrigation methods X K levels</b>					<b>KSB treatment X K levels</b>				
	K1	K2	Mean M		S1	S2	S3	Mean M		S1	S2	S3	Mean M
M1	4.90	6.67	5.78	M1	4.93	5.92	6.50	5.78	K1	3.61	4.17	5.00	4.26
M2	3.62	3.39	3.50	M2	3.19	3.50	3.83	3.50	K2	4.51	5.25	5.34	5.03
Mean K	4.26	5.03		Mean S	4.06	4.71	5.17		Mean S	4.06	4.71	5.17	
<b>Irrigation methods X KSB treatment X K levels</b>				<b>Factors</b>					<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>		
		M1		M2		Irrigation methods				1.86	0.43	0.30	
		K1	K2	K1	K2	KSB treatment				0.50	0.24	0.17	
S1	4.14	5.73	3.09	3.28	Irrigation methods X KSB treatment				0.71	0.34	0.24		
S2	4.72	7.12	3.62	3.38	K levels				0.61	0.29	0.21		
S3	5.83	7.17	4.16	3.50	Irrigation methods X K levels				NS	0.42	0.29		
					KSB treatment X K levels				NS	0.42	0.29		
					Irrigation methods X KSB treatment X K levels				NS	0.59	0.42		
<b>Yield of tubers 50-75g (t/ha)</b>													
<b>Irrigation methods X KSB treatment</b>				<b>Irrigation methods X K levels</b>					<b>KSB treatment X K levels</b>				
	K1	K2	Mean M		S1	S2	S3	Mean M		S1	S2	S3	Mean M
M1	9.75	11.44	10.59	M1	8.78	10.94	12.06	10.59	K1	7.67	9.04	10.07	8.92
M2	8.10	9.41	8.75	M2	7.20	8.73	10.34	8.75	K2	8.31	10.63	12.33	10.42
Mean K	8.92	10.42		Mean S	7.99	9.83	11.20		Mean S	7.99	9.83	11.20	
<b>Irrigation methods X KSB treatment X K levels</b>				<b>Factors</b>					<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>		
		M1		M2		Irrigation methods				0.66	0.15	0.11	
		K1	K2	K1	K2	KSB treatment				0.61	0.29	0.21	
S1	8.27	9.29	7.06	7.33	Irrigation methods X KSB treatment				NS	0.42	0.29		
S2	10.30	11.58	7.77	9.68	K levels				0.75	0.36	0.25		



S3	10.68	13.45	9.46	11.21	Irrigation methods X K levels				NS	0.51	0.36		
					KSB treatment X K levels				NS	0.51	0.36		
					Irrigation methods X KSB treatment X K levels				NS	0.72	0.51		
<b>Yield of tubers &gt;75g (t/ha)</b>													
<b>Irrigation methods X KSB treatment</b>				<b>Irrigation methods X K levels</b>					<b>KSB treatment X K levels</b>				
	K1	K2	Mean M		S1	S2	S3	Mean M		S1	S2	S3	Mean M
M1	19.01	20.77	19.89	M1	17.88	19.58	22.21	19.89	K1	15.49	17.31	19.68	17.49
M2	15.98	18.19	17.08	M2	14.32	17.52	19.41	17.08	K2	16.71	19.79	21.94	19.48
Mean K	17.49	19.48		Mean S	16.10	18.55	20.81		Mean S	16.10	18.55	20.81	
<b>Irrigation methods X KSB treatment X K levels</b>				<b>Factors</b>					<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>		
		M1		M2		Irrigation methods			2.22	0.51	0.36		
		K1	K2	K1	K2	KSB treatment			0.80	0.38	0.27		
S1	17.36	18.40	13.62	15.01	Irrigation methods X KSB treatment			NS	0.54	0.38			
S2	18.54	20.62	16.08	18.96	K levels			0.98	0.47	0.33			
S3	21.13	23.29	18.23	20.59	Irrigation methods X K levels			NS	0.66	0.47			
					KSB treatment X K levels			NS	0.66	0.47			
					Irrigation methods X KSB treatment X K levels			NS	0.94	0.66			
<b>Total yield (t/ha)</b>													
<b>Irrigation methods X KSB treatment</b>				<b>Irrigation methods X K levels</b>					<b>KSB treatment X K levels</b>				
	K1	K2	Mean M		S1	S2	S3	Mean M		S1	S2	S3	Mean M
M1	34.91	40.00	37.46	M1	32.99	37.56	41.81	37.46	K1	27.92	31.32	35.63	31.62
M2	28.33	31.56	29.95	M2	25.51	30.30	34.03	29.95	K2	30.58	36.54	40.21	35.78
Mean K	31.62	35.78		Mean S	29.25	33.93	37.92		Mean S	29.25	33.93	37.92	
<b>Irrigation methods X KSB treatment X K levels</b>				<b>Factors</b>					<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>		
		M1		M2		Irrigation methods			2.76	0.63	0.45		
		K1	K2	K1	K2	KSB treatment			1.19	0.57	0.40		
S1	31.13	34.85	24.71	26.32	Irrigation methods X KSB treatment			NS	0.81	0.57			
S2	34.68	40.45	27.96	32.64	K levels			1.46	0.70	0.50			
S3	38.93	44.69	32.32	35.74	Irrigation methods X K levels			NS	0.99	0.70			
					KSB treatment X K levels			NS	0.99	0.70			
					Irrigation methods X KSB treatment X K levels			NS	1.40	0.99			
<b>Dry Matter Content (%)</b>													
<b>Irrigation methods X KSB treatment</b>				<b>Irrigation methods X K levels</b>					<b>KSB treatment X K levels</b>				
	K1	K2	Mean M		S1	S2	S3	Mean M		S1	S2	S3	Mean M
M1	20.66	20.39	20.53	M1	19.93	20.58	21.08	20.53	K1	19.65	19.93	20.52	20.03
M2	19.41	19.26	19.33	M2	19.15	19.19	19.66	19.33	K2	19.43	19.84	20.21	19.83
Mean K	20.03	19.83		Mean S	19.54	19.88	20.37		Mean S	19.54	19.88	20.37	
<b>Irrigation methods X KSB treatment X K levels</b>				<b>Factors</b>					<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>		
		M1		M2		Irrigation methods			1.01	0.23	0.16		
		K1	K2	K1	K2	KSB treatment			NS	0.29	0.21		
S1	20.11	19.74	19.19	19.12	Irrigation methods X KSB treatment			NS	0.41	0.29			
S2	20.67	20.49	19.19	19.19	K levels			NS	0.36	0.25			
S3	21.20	20.95	19.84	19.47	Irrigation methods X K levels			NS	0.50	0.36			
					KSB treatment X K levels			NS	0.50	0.36			
					Irrigation methods X KSB treatment X K levels			NS	0.71	0.50			
<b>Tuber yield on dry weight basis (t/ha)</b>													
<b>Irrigation methods X KSB treatment</b>				<b>Irrigation methods X K levels</b>					<b>KSB treatment X K levels</b>				
	K1	K2	Mean M		S1	S2	S3	Mean M		S1	S2	S3	Mean M
M1	7.23	8.18	7.70	M1	6.57	7.73	8.82	7.70	K1	5.50	6.27	7.34	6.37
M2	5.50	6.08	5.79	M2	4.88	5.81	6.69	5.79	K2	5.95	7.27	8.17	7.13
Mean K	6.37	7.13		Mean S	5.73	6.77	7.75		Mean S	5.73	6.77	7.75	
<b>Irrigation methods X KSB treatment X K levels</b>				<b>Factors</b>					<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>		
		M1		M2		Irrigation methods			0.94	0.22	0.15		
		K1	K2	K1	K2	KSB treatment			0.33	0.16	0.11		
S1	6.27	6.87	4.73	5.03	Irrigation methods X KSB treatment			NS	0.22	0.16			
S2	7.17	8.28	5.36	6.26	K levels			0.40	0.19	0.14			
S3	8.26	9.37	6.42	6.96	Irrigation methods X K levels			NS	0.27	0.19			
					KSB treatment X K levels			NS	0.27	0.19			
					Irrigation methods X KSB treatment X K levels			NS	0.38	0.27			

**Table 780:** Economics

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
M <sub>1</sub> K <sub>1</sub> S <sub>1</sub>	31.13	45000	14649	38500	98149	124520	4000	26371	0.27
M <sub>1</sub> K <sub>1</sub> S <sub>2</sub>	34.68	45000	16606	38500	100106	138720	4000	38614	0.39
M <sub>1</sub> K <sub>1</sub> S <sub>3</sub>	38.93	45000	18564	38500	102064	155720	4000	53656	0.53
M <sub>1</sub> K <sub>2</sub> S <sub>1</sub>	34.85	45000	16749	39000	100749	139400	4000	38651	0.38
M <sub>1</sub> K <sub>2</sub> S <sub>2</sub>	40.45	45000	18706	39000	102706	161800	4000	59094	0.58
M <sub>1</sub> K <sub>2</sub> S <sub>3</sub>	44.69	45000	20664	39000	104664	178760	4000	74096	0.71
M <sub>2</sub> K <sub>1</sub> S <sub>1</sub>	24.71	45000	14649	38500	98149	98840	4000	691	0.01
M <sub>2</sub> K <sub>1</sub> S <sub>2</sub>	27.96	45000	16606	38500	100106	111840	4000	11734	0.12
M <sub>2</sub> K <sub>1</sub> S <sub>3</sub>	32.32	45000	18564	38500	102064	129280	4000	27216	0.27
M <sub>2</sub> K <sub>2</sub> S <sub>1</sub>	26.32	45000	16749	39000	100749	105280	4000	4531	0.04
M <sub>2</sub> K <sub>2</sub> S <sub>2</sub>	32.64	45000	18706	39000	102706	130560	4000	27854	0.27
M <sub>2</sub> K <sub>2</sub> S <sub>3</sub>	35.74	45000	20664	39000	104664	142960	4000	38296	0.37

## AGRON 12: PERFORMANCE OF POTATO CULTIVARS UNDER DRIP IRRIGATION

The experiment was conducted at Hisar center only to study the effect of crop duration on four potato cultivars with two crop duration. The total tuber yield was in the order of Kufri Surya = Kufri Pukhraj < Kufri Bahar < Kufri Pushkar. Delaying harvesting by 15 days (i.e. 90 days) increased the mean tuber yield by about 40%. The interaction of variety x date of harvesting was not significant on total tuber yield.

**Table 781:** Experimental and treatments details at different locations.

Center	HIS		
Year	2016-17	Design	RBD
Rep	3	Spacing (cm)	60 x 30
Gross plot size (m <sup>2</sup> )	30.0	Date of Planting	22.10.16
Net plot size (m <sup>2</sup> )	18.0	Date of Haulm cutting	
Varieties		75 days crop	H1 07.01.17
V1	K Bahar	90 days crop	H2 22.01.17
V2	K Pukhraj	Date of Harvesting	
V3	K Puskar	75 days crop	H1 13.02.17
V4	K Surya	90 days crop	H2 15.02.17
Recommended dose of N: P: K (kg/ha)	150:50:100		

### Treatments:

- Crop duration (H) : Two
  - 75 days crop
  - 90 days crop
- Varieties (V) : Four

**Table 782:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)					Yield of tubers 0-25g (t/ha)				
	V1	V2	V3	V4	Mean H	V1	V2	V3	V4	Mean H
H1	89.00	84.40	89.99	88.32	87.93	2.14	2.32	5.00	2.69	3.04
H2	90.20	88.10	86.77	89.31	88.59	5.49	1.52	3.90	1.78	3.17
Mean V	89.60	86.25	88.38	88.81		3.82	1.92	4.45	2.24	
SE (H)	2.29					0.78				
SE (V)	3.24					1.11				
SE (HV)	4.58					1.57				
CD H ( 5%)	NS					NS				
CD V ( 5%)	NS					NS				
CD HV (5%)	NS					NS				
Treatments	Yield of tubers 25-50g (t/ha)					Yield of tubers 50-75g (t/ha)				
	V1	V2	V3	V4	Mean H	V1	V2	V3	V4	Mean H
H1	7.28	8.56	10.67	6.12	8.16	5.72	5.41	6.99	4.99	5.78
H2	8.11	9.59	14.74	7.73	10.04	9.78	8.41	12.12	6.39	9.17
Mean V	7.70	9.08	12.71	6.93		7.75	6.91	9.55	5.69	
SE (H)	0.71					0.91				
SE (V)	1.01					1.29				
SE (HV)	1.43					1.82				
CD H ( 5%)	1.55					1.97				
CD V ( 5%)	2.19					NS				
CD HV (5%)	NS					NS				
Treatments	Yield of tubers >75g (t/ha)					Total yield (t/ha)				
	V1	V2	V3	V4	Mean H	V1	V2	V3	V4	Mean H
H1	4.53	2.13	2.78	2.83	3.07	19.66	18.42	25.44	16.63	20.04
H2	8.10	4.89	5.15	4.44	5.65	31.48	24.41	35.91	20.33	28.03
Mean V	6.31	3.51	3.97	3.64		25.57	21.41	30.68	18.48	
SE (H)	0.44					1.45				

SE (V)	0.62					2.05				
SE (HV)	0.88					2.90				
CD H ( 5%)	0.95					3.14				
CD V ( 5%)	1.35					4.44				
CD HV (5%)	NS					NS				
Treatments	No of tubers 0-25g (no/ha)					No of tubers 25-50g (no/ha)				
	V1	V2	V3	V4	Mean H	V1	V2	V3	V4	Mean H
H1	155000	101111	201111	126667	145972	155556	148889	251111	118333	168472
H2	198889	107778	203889	137222	161945	167222	177778	273889	149445	192084
Mean V	176945	104445	202500	131944		161389	163334	262500	133889	
SE (H)	22122					8452				
SE (V)	31285					11953				
SE (HV)	44243					16904				
CD H ( 5%)	NS					18304				
CD V ( 5%)	67749					25886				
CD HV (5%)	NS					NS				
Treatments	No of tubers 50-75g (no/ha)					No of tubers >75g (no/ha)				
	V1	V2	V3	V4	Mean H	V1	V2	V3	V4	Mean H
H1	76667	82222	121667	66667	86806	43889	27222	31111	26667	32222
H2	125000	106667	153889	93889	119861	50000	36111	35556	33889	38889
Mean V	100833	94445	137778	80278		46945	31667	33333	30278	
SE (H)	11217					1282				
SE (V)	15863					1812				
SE (HV)	22434					2563				
CD H ( 5%)	24291					2775				
CD V ( 5%)	34353					3925				
CD HV (5%)	NS					NS				
Treatments	Total no of tubers (no/ha)									
	V1	V2	V3	V4	Mean H					
H1	431111	359445	605000	338334	433473					
H2	541112	428334	667223	414445	512778					
Mean V	486112	393890	636112	376389						
SE (H)	17019									
SE (V)	24068									
SE (HV)	34037									
CD H ( 5%)	36855									
CD V ( 5%)	52121									
CD HV (5%)	NS									

## AGRON 13: EFFECT OF SPACING, FERTILITY LEVELS AND DATES OF HAULM CUTTING ON QUALITY SEED GRADE TUBER PRODUCTION OF POTATO

**Table 783:** Experimental and treatments details at different locations.

Location	:	Kalyani	Year	:	2016-17
Design	:	Split Plot	Replication	:	Three
Gross plot size (m <sup>2</sup> )	:	10.08	Net plot size (m <sup>2</sup> )	:	6
Spacing (cm) S1	:	60 cm x 20 cm	Date of planting	:	06.11.2016
S2	:	60 cm x 10 cm			
Date of haulm cutting	:	As per treatment	Date of harvest	:	As per treatment
Recommended dose of N: P: K (kg/ha)	:	200 : 150 : 150	Variety planted	:	Kufri Himalini

Date of haulm cutting	:	Spacing (S1)	Spacing (S2)
H1 (75 days crop)	:	10.01.2017	10.01.2017
H2 (90 days crop)	:	25.01.2017	25.01.2017
Date of harvest			
H1 (75 days crop)	:	20.01.2017	20.01.2017
H2 (90 days crop)	:	04.02.2017	04.02.2017

### Treatments

#### **A. Spacing- 2 levels**

60cm X 20cm  
60cm X 10cm

#### **B. Fertility – 3 Levels**

100% RDF of NPK+ 0.1% boric acid as foliar application in three times at 40, 50 and 60 DAP  
75% RDF of NPK+ 0.1% boric acid as foliar application in three times at 40, 50 and 60 DAP  
50% RDF of NPK+ 0.1% boric acid as foliar application in three times at 40, 50 and 60 DAP

#### **C. Date of haulm cutting**

75 days after planting  
90 days after planting

The result of the experiment revealed that emergence of potato was not significantly affected by spacing, dates of haulm cutting, fertility levels and their interactions. The total tuber yield of potato was significantly influenced by fertility levels but effect of spacing and dates of haulm cutting on total tuber yield was found statistically insignificant. The highest total tuber yield was recorded fewer than 100% RDF of NPK with 0.1% boric acid as foliar application in three times at 40, 50 and 60 DAP. 50-75g and >75g grade tuber production was significantly influenced by spacing whereas dates of haulm cutting was found to have a significant effect on 0-25 g and >75 g grade tuber production. Haulm cutting at 10 days later significantly increased the >75g grade tuber production and significantly reduced the 0-25g grade tuber production. Interaction of spacing and fertility levels had a significant effect on total tuber yield of potato variety Kufri Himalini. Use of 60cmX 20 cm spacing with 100%RDF recorded highest total and marketable tuber yield of potato.

The total number of seed tubers and seed grade sized tuber numbers were significantly higher under 60 cm x 10 cm spacing, whereas dates of haulm cutting was found to have significant effect on 0-25 g and >75 g grade tuber numbers. Haulm cutting at 10 days earlier significantly increased the 0-25 g grade tuber number and significantly reduced the >75 g grade tuber numbers. Use of low fertility levels i.e. 50% RDF of NPK + 0.1% boric acid as foliar application in three times at 40,50 and 60 DAP significantly increased the seed grade (0-25 g, 25-50g and 50-75g) sized tuber numbers of potato and significantly lowered the >75g grade tuber numbers. Interaction of these three factors on tuber numbers was found mostly significant. Thus, for quality seed grade sized tuber production use of 60 cm x 10 cm spacing along with dehaulming at 65 days after planting with 50% RDF of NPK was found best under West Bengal situation to get higher number of quality seed grade sized tubers.

**Table 784:** Main & interaction effects of irrigation methods, KSB treatment and K levels on plant emergence (%), grade-wise yield (t/ha), dry matter content (%) and tuber yield on dry weight basis (t/ha)

Emergence (%)													
Spacing X Dates of haulm cutting				Spacing X Fertility Levels				Dates of haulm cutting X Fertility Levels					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	99.29	99.68	99.48	M1	99.45	99.53	99.47	99.48	K1	99.35	99.37	99.12	99.28
M2	99.27	99.71	99.49	M2	99.72	99.67	99.08	99.49	K2	99.82	99.83	99.43	99.69
Mean	99.28	99.69		Mean	99.58	99.60	99.28		Mean	99.58	99.60	99.28	
Spacing X Dates of haulm cutting X Fertility Levels				Factors						CD 5%	SE(d)	SE(m)	
	M1		M2		Spacing				0.33	0.08	0.05		
	K1	K2	K1	K2	Dates of haulm cutting				NS	0.26	0.19		
S1	99.27	99.63	99.43	100.00	Spacing X Dates of haulm cutting				NS	0.37	0.26		
S2	99.27	99.80	99.47	99.87	Fertility Levels				NS	0.27	0.19		
S3	99.33	99.60	98.90	99.27	Spacing X Fertility Levels				NS	0.38	0.27		
					Dates of haulm cutting X Fertility Levels				NS	0.38	0.27		
					Spacing X Dates of haulm cutting X Fertility Levels				NS	0.54	0.38		
Plant height (cm)													
Spacing X Dates of haulm cutting				Spacing X Fertility Levels				Dates of haulm cutting X Fertility Levels					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	71.94	71.39	71.67	M1	74.32	71.08	69.60	71.67	K1	73.48	71.43	69.17	71.36
M2	70.78	70.89	70.83	M2	72.33	71.08	69.08	70.83	K2	73.17	70.73	69.52	71.14
Mean	71.36	71.14		Mean	73.33	71.08	69.34		Mean	73.33	71.08	69.34	
Spacing X Dates of haulm cutting X Fertility Levels				Factors						CD 5%	SE(d)	SE(m)	
	M1		M2		Spacing				NS	0.33	0.24		
	K1	K2	K1	K2	Dates of haulm cutting				NS	0.22	0.15		
S1	74.53	74.10	72.43	72.23	Spacing X Dates of haulm cutting				NS	0.31	0.22		
S2	71.70	70.47	71.17	71.00	Fertility Levels				0.90	0.42	0.30		
S3	69.60	69.60	68.73	69.43	Spacing X Fertility Levels				NS	0.60	0.42		
					Dates of haulm cutting X Fertility Levels				NS	0.60	0.42		
					Spacing X Dates of haulm cutting X Fertility Levels				NS	0.85	0.60		
No. of shoots/plant													
Spacing X Dates of haulm cutting				Spacing X Fertility Levels				Dates of haulm cutting X Fertility Levels					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	3.13	3.16	3.14	M1	3.38	3.08	2.97	3.14	K1	3.24	3.15	2.92	3.10
M2	3.08	3.12	3.10	M2	3.23	3.15	2.92	3.10	K2	3.37	3.08	2.97	3.14
Mean	3.10	3.14		Mean	3.30	3.12	2.94		Mean	3.30	3.12	2.94	
Spacing X Dates of haulm cutting X Fertility Levels				Factors						CD 5%	SE(d)	SE(m)	
	M1		M2		Spacing				NS	0.06	0.04		
	K1	K2	K1	K2	Dates of haulm cutting				NS	0.08	0.06		
S1	3.25	3.50	3.23	3.23	Spacing X Dates of haulm cutting				NS	0.11	0.08		
S2	3.13	3.03	3.17	3.13	Fertility Levels				0.15	0.07	0.05		
S3	3.00	2.93	2.83	3.00	Spacing X Fertility Levels				NS	0.10	0.07		
					Dates of haulm cutting X Fertility Levels				NS	0.10	0.07		
					Spacing X Dates of haulm cutting X Fertility Levels				NS	0.14	0.10		
Yield of tubers 0-25g (t/ha)													
Spacing X Dates of haulm cutting				Spacing X Fertility Levels				Dates of haulm cutting X Fertility Levels					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	3.34	2.58	2.96	M1	2.53	2.81	3.55	2.96	K1	3.16	3.32	4.42	3.63
M2	3.92	3.52	3.72	M2	3.22	3.54	4.40	3.72	K2	2.59	3.03	3.54	3.05
Mean	3.63	3.05		Mean	2.87	3.17	3.98		Mean	2.87	3.17	3.98	
Spacing X Dates of haulm cutting X Fertility Levels				Factors						CD 5%	SE(d)	SE(m)	
	M1		M2		Spacing				NS	0.28	0.20		
	K1	K2	K1	K2	Dates of haulm cutting				0.54	0.19	0.14		
S1	3.07	1.99	3.24	3.20	Spacing X Dates of haulm cutting				NS	0.28	0.19		
S2	3.04	2.58	3.60	3.47	Fertility Levels				0.42	0.20	0.14		
S3	3.92	3.19	4.92	3.89	Spacing X Fertility Levels				NS	0.28	0.20		
					Dates of haulm cutting X Fertility Levels				NS	0.28	0.20		
					Spacing X Dates of haulm cutting X Fertility Levels				NS	0.40	0.28		
Yield of tubers 25-50g (t/ha)													
Spacing X Dates of haulm cutting				Spacing X Fertility Levels				Dates of haulm cutting X Fertility Levels					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	6.29	5.96	6.12	M1	6.42	5.65	6.31	6.12	K1	6.67	6.74	7.16	6.86

M2	7.42	6.94	7.18	M2	6.79	6.94	7.81	7.18	K2	6.54	5.85	6.95	6.45
Mean	6.86	6.45		Mean	6.61	6.29	7.06		Mean	6.61	6.29	7.06	
<b>Spacing X Dates of haulm cutting X Fertility Levels</b>					<b>Factors</b>					<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>	
	M1		M2		Spacing				NS	0.41	0.29		
	K1	K2	K1	K2	Dates of haulm cutting				NS	0.50	0.36		
S1	6.46	6.39	6.89	6.69	Spacing X Dates of haulm cutting				NS	0.71	0.50		
S2	6.19	5.10	7.29	6.59	Fertility Levels				NS	0.47	0.33		
S3	6.23	6.38	8.08	7.53	Spacing X Fertility Levels				NS	0.66	0.47		
					Dates of haulm cutting X Fertility Levels				NS	0.66	0.47		
					Spacing X Dates of haulm cutting X Fertility Levels				NS	0.93	0.66		
<b>Yield of tubers 50-75g (t/ha)</b>													
<b>Spacing X Dates of haulm cutting</b>				<b>Spacing X Fertility Levels</b>				<b>Dates of haulm cutting X Fertility Levels</b>					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	6.90	6.79	6.85	M1	6.41	6.99	7.15	6.85	K1	7.15	8.08	8.04	7.75
M2	8.61	8.59	8.60	M2	7.28	9.09	9.43	8.60	K2	6.54	7.99	8.54	7.69
Mean	7.75	7.69		Mean	6.84	8.04	8.29		Mean	6.84	8.04	8.29	
<b>Spacing X Dates of haulm cutting X Fertility Levels</b>					<b>Factors</b>					<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>	
	M1		M2		Spacing				0.30	0.07	0.05		
	K1	K2	K1	K2	Dates of haulm cutting				NS	0.20	0.14		
S1	6.72	6.10	7.58	6.98	Spacing X Dates of haulm cutting				NS	0.28	0.20		
S2	7.00	6.97	9.15	9.02	Fertility Levels				0.96	0.45	0.32		
S3	6.99	7.31	9.09	9.76	Spacing X Fertility Levels				NS	0.64	0.45		
					Dates of haulm cutting X Fertility Levels				NS	0.64	0.45		
					Spacing X Dates of haulm cutting X Fertility Levels				NS	0.90	0.64		
<b>Yield of tubers &gt;75g (t/ha)</b>													
<b>Spacing X Dates of haulm cutting</b>				<b>Spacing X Fertility Levels</b>				<b>Dates of haulm cutting X Fertility Levels</b>					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	11.80	13.91	12.85	M1	18.30	12.47	7.80	12.85	K1	14.62	9.89	6.20	10.24
M2	8.67	10.44	9.56	M2	13.18	9.27	6.22	9.56	K2	16.87	11.85	7.81	12.18
Mean	10.24	12.18		Mean	15.74	10.87	7.01		Mean	15.74	10.87	7.01	
<b>Spacing X Dates of haulm cutting X Fertility Levels</b>					<b>Factors</b>					<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>	
	M1		M2		Spacing				0.65	0.15	0.11		
	K1	K2	K1	K2	Dates of haulm cutting				0.68	0.25	0.18		
S1	16.89	19.70	12.34	14.03	Spacing X Dates of haulm cutting				NS	0.35	0.25		
S2	11.27	13.67	8.51	10.03	Fertility Levels				0.74	0.35	0.25		
S3	7.23	8.36	5.17	7.26	Spacing X Fertility Levels				1.05	0.49	0.35		
					Dates of haulm cutting X Fertility Levels				NS	0.49	0.35		
					Spacing X Dates of haulm cutting X Fertility Levels				NS	0.70	0.49		
<b>Total yield (t/ha)</b>													
<b>Spacing X Dates of haulm cutting</b>				<b>Spacing X Fertility Levels</b>				<b>Dates of haulm cutting X Fertility Levels</b>					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	28.34	29.24	28.79	M1	33.65	27.91	24.80	28.79	K1	31.59	28.04	25.81	28.48
M2	28.62	29.49	29.05	M2	30.47	28.83	27.85	29.05	K2	32.54	28.71	26.84	29.36
Mean	28.48	29.36		Mean	32.06	28.37	26.33		Mean	32.06	28.37	26.33	
<b>Spacing X Dates of haulm cutting X Fertility Levels</b>					<b>Factors</b>					<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>	
	M1		M2		Spacing				NS	0.57	0.40		
	K1	K2	K1	K2	Dates of haulm cutting				NS	0.40	0.28		
S1	33.13	34.17	30.04	30.90	Spacing X Dates of haulm cutting				NS	0.56	0.40		
S2	27.51	28.31	28.56	29.11	Fertility Levels				1.70	0.80	0.57		
S3	24.37	25.23	27.26	28.45	Spacing X Fertility Levels				2.40	1.13	0.80		
					Dates of haulm cutting X Fertility Levels				NS	1.13	0.80		
					Spacing X Dates of haulm cutting X Fertility Levels				NS	1.60	1.13		
<b>Tuber yield on dry weight basis (t/ha)</b>													
<b>Spacing X Dates of haulm cutting</b>				<b>Spacing X Fertility Levels</b>				<b>Dates of haulm cutting X Fertility Levels</b>					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	5.67	5.85	5.76	M1	6.73	5.58	4.96	5.76	K1	6.32	5.61	5.16	5.70
M2	5.72	5.90	5.81	M2	6.10	5.77	5.57	5.81	K2	6.51	5.74	5.37	5.87
Mean	5.70	5.87		Mean	6.41	5.68	5.26		Mean	6.41	5.68	5.26	
<b>Spacing X Dates of haulm cutting X Fertility Levels</b>					<b>Factors</b>					<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>	
	M1		M2		Spacing				NS	0.11	0.08		
	K1	K2	K1	K2	Dates of haulm cutting				NS	0.08	0.06		
S1	6.62	6.83	6.01	6.18	Spacing X Dates of haulm cutting				NS	0.11	0.08		
S2	5.50	5.66	5.71	5.82	Fertility Levels				0.34	0.16	0.11		

S3	4.87	5.05	5.45	5.69	Spacing X Fertility Levels				0.48	0.23	0.16		
					Dates of haulm cutting X Fertility Levels				NS	0.23	0.16		
					Spacing X Dates of haulm cutting X Fertility Levels				NS	0.32	0.23		
<b>Haulm yield on dry weight basis (t/ha)</b>													
Spacing X Dates of haulm cutting				Spacing X Fertility Levels				Dates of haulm cutting X Fertility Levels					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	3.40	3.51	3.45	M1	4.04	3.35	2.98	3.45	K1	3.79	3.37	3.10	3.42
M2	3.44	3.54	3.49	M2	3.66	3.46	3.34	3.49	K2	3.91	3.45	3.22	3.52
Mean	3.42	3.52		Mean	3.85	3.41	3.16		Mean	3.85	3.41	3.16	
Spacing X Dates of haulm cutting X Fertility Levels				Factors					CD 5%	SE(d)	SE(m)		
		M1		M2		Spacing			NS	0.07	0.05		
		K1	K2	K1	K2	Dates of haulm cutting			NS	0.05	0.03		
S1	3.97	4.10	3.61	3.71	Spacing X Dates of haulm cutting			NS	0.07	0.05			
S2	3.30	3.40	3.43	3.49	Fertility Levels			0.21	0.10	0.07			
S3	2.92	3.03	3.27	3.41	Spacing X Fertility Levels			0.29	0.14	0.10			
					Dates of haulm cutting X Fertility Levels			NS	0.14	0.10			
					Spacing X Dates of haulm cutting X Fertility Levels			NS	0.19	0.14			
<b>No of tuber 0-25g (no/ha)</b>													
Spacing X Dates of haulm cutting				Spacing X Fertility Levels				Dates of haulm cutting X Fertility Levels					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	194444	165741	180093	M1	144444	187500	208333	180093	K1	191667	215278	255556	220833
M2	247222	214815	231019	M2	198611	225000	269445	231019	K2	151389	197222	222222	190278
Mean	220833	190278		Mean	171528	206250	238889		Mean	171528	206250	238889	
Spacing X Dates of haulm cutting X Fertility Levels				Factors					CD 5%	SE(d)	SE(m)		
		M1		M2		Spacing			35731	8191	5792		
		K1	K2	K1	K2	Dates of haulm cutting			30327	10985	7768		
S1	169444	119444	213889	183333	Spacing X Dates of haulm cutting			NS	15535	10985			
S2	197222	177778	233333	216667	Fertility Levels			19103	9010	6371			
S3	216666	200000	294445	244445	Spacing X Fertility Levels			NS	12742	9010			
					Dates of haulm cutting X Fertility Levels			NS	12742	9010			
					Spacing X Dates of haulm cutting X Fertility Levels			NS	18020	12742			
<b>No of tuber 25-50g (no/ha)</b>													
Spacing X Dates of haulm cutting				Spacing X Fertility Levels				Dates of haulm cutting X Fertility Levels					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	165741	157408	161574	M1	141667	163889	179167	161574	K1	168056	190278	209722	189352
M2	212963	187963	200463	M2	181945	201389	218056	200463	K2	155556	175000	187500	172685
Mean	189352	172685		Mean	161806	182639	198611		Mean	161806	182639	198611	
Spacing X Dates of haulm cutting X Fertility Levels				Factors					CD 5%	SE(d)	SE(m)		
		M1		M2		Spacing			27321	6263	4428		
		K1	K2	K1	K2	Dates of haulm cutting			NS	10424	7371		
S1	144445	138889	191667	172222	Spacing X Dates of haulm cutting			NS	14742	10424			
S2	166667	161111	213889	188889	Fertility Levels			17149	8089	5720			
S3	186111	172222	233333	202778	Spacing X Fertility Levels			NS	11439	8089			
					Dates of haulm cutting X Fertility Levels			NS	11439	8089			
					Spacing X Dates of haulm cutting X Fertility Levels			NS	16177	11439			
<b>No of tuber 50-75g (no/ha)</b>													
Spacing X Dates of haulm cutting				Spacing X Fertility Levels				Dates of haulm cutting X Fertility Levels					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	108333	101852	105093	M1	90278	106945	118056	105093	K1	105556	130556	143056	126389
M2	144444	137963	141204	M2	115278	148611	159722	141204	K2	100000	125000	134722	119907
Mean	126389	119907		Mean	102778	127778	138889		Mean	102778	127778	138889	
Spacing X Dates of haulm cutting X Fertility Levels				Factors					CD 5%	SE(d)	SE(m)		
		M1		M2		Spacing			6059	1389	982		
		K1	K2	K1	K2	Dates of haulm cutting			NS	2361	1669		
S1	94444	86111	116667	113889	Spacing X Dates of haulm cutting			NS	3338	2361			
S2	108333	105556	152778	144444	Fertility Levels			16417	7743	5475			
S3	122222	113889	163889	155556	Spacing X Fertility Levels			NS	10951	7743			
					Dates of haulm cutting X Fertility Levels			NS	10951	7743			
					Spacing X Dates of haulm cutting X Fertility Levels			NS	15487	10951			
<b>No of tuber &gt;75g (no/ha)</b>													
Spacing X Dates of haulm cutting				Spacing X Fertility Levels				Dates of haulm cutting X Fertility Levels					
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean
M1	94445	99074	96759	M1	122222	100000	68056	96759	K1	101389	91667	65278	86111
M2	77778	92593	85185	M2	97222	86111	72222	85185	K2	118056	94445	75000	95833



Mean	86111	95833		Mean	109722	93056	70139		Mean	109722	93056	70139		
<b>Spacing X Dates of haulm cutting X Fertility Levels</b>				<b>Factors</b>						<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>		
	M1		M2		Spacing					11245	2578	1823		
	K1	K2	K1	K2	Dates of haulm cutting					5716	2070	1464		
S1	119445	125000	83333	111111	Spacing X Dates of haulm cutting					NS	2928	2070		
S2	97222	102778	86111	86111	Fertility Levels					5950	2807	1985		
S3	66667	69445	63889	80555	Spacing X Fertility Levels					8415	3969	2807		
				Dates of haulm cutting X Fertility Levels					NS	3969	2807			
				Spacing X Dates of haulm cutting X Fertility Levels					NS	5613	3969			
<b>Total number of tuber (no/ha)</b>														
<b>Spacing X Dates of haulm cutting</b>				<b>Spacing X Fertility Levels</b>				<b>Dates of haulm cutting X Fertility Levels</b>						
	K1	K2	Mean		S1	S2	S3	Mean		S1	S2	S3	Mean	
M1	562963	524074	543518	M1	498611	558333	573611	543518	K1	566667	627778	673611	622685	
M2	682407	633333	657870	M2	593056	661111	719445	657870	K2	525000	591667	619445	578704	
Mean	622685	578704		Mean	545833	609722	646528		Mean	545833	609722	646528		
<b>Spacing X Dates of haulm cutting X Fertility Levels</b>				<b>Factors</b>						<b>CD 5%</b>	<b>SE(d)</b>	<b>SE(m)</b>		
	M1		M2		Spacing					60024	13760	9729		
	K1	K2	K1	K2	Dates of haulm cutting					NS	16788	11871		
S1	527778	469444	605555	580556	Spacing X Dates of haulm cutting					NS	23742	16788		
S2	569444	547222	686111	636111	Fertility Levels					33896	15987	11305		
S3	591667	555556	755556	683334	Spacing X Fertility Levels					NS	22609	15987		
				Dates of haulm cutting X Fertility Levels					NS	22609	15987			
				Spacing X Dates of haulm cutting X Fertility Levels					NS	31975	22609			

## AGRON 14: EFFECT OF PLANT GROWTH REGULATOR ON TUBER YIELD OF POTATO

**Table 785:** Experimental and treatments details at different locations.

Center	RPR		
	Year	Design	RBD
Year	2016-17	Design	RBD
Replication	3	Spacing (cm)	60 x 20
Gross plot size (m <sup>2</sup> )	8.64	Date of Planting	14.11.16
Net plot size (m <sup>2</sup> )	4.80	Date of Haulm cutting	12.02.17
Variety	K Pukhraj	Date of Harvesting	20.02.17
Recommended dose of N: P: K (kg/ha)	150:100:100		

### Treatments

- A. Methods of PGR application,
  1. M1 (Seed treatment) and
  2. M2 (Spray treatment) and
- B. Levels of plant growth regulators
  1. T1 : (control) Plain water spray
  2. T2 : (GA<sub>3</sub> 25 ppm)
  3. T3 : (GA<sub>3</sub> 50 ppm)
  4. T4 : (IBA 100 ppm) and
  5. T5 : (IBA 200 ppm)PGR

Application of PGR by spraying to leaf at early (30 DAT) and late (60 DAT) stages.

Two growth regulators (GA<sub>3</sub> and IBA) were applied at two different concentrations and through two different methods at Raipur on Potato cultivar Kufri Pukhraj. The results revealed that the total tuber yield with application of IBA at 200 ppm was highest (31.4 t/ha) among all treatments tried. However, this was statistically at par with the IBA at 100 ppm but significantly superior over GA<sub>3</sub> (either at 25 or 50ppm). The effect of methods of plant growth regulator as well as its interaction with levels of plant growth regulators was not significant on total tuber yield.

**Table 786:** Plant emergence (%), morphological traits, grade-wise tuber yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)						Plant height (cm)					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M1	93.33	100.00	98.33	93.33	71.67	91.33	47.40	53.89	52.33	43.80	41.38	47.76
M2	94.17	91.67	90.83	91.67	92.50	92.17	47.11	48.30	47.30	41.53	46.21	46.09
Means	93.75	95.83	94.58	92.50	82.08		47.26	51.09	49.82	42.66	43.80	
SE (M)	1.12						1.58					
SE (T)	1.77						2.50					
SE (MT)	2.50						3.53					
CD M (5%)	NS						NS					
CD T (5%)	3.74						5.29					
CD MT (5%)	5.29						NS					
Treatments	No. of shoots/plant						Yield 0-25g (t/ha)					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M1	6.47	10.93	10.00	6.73	8.93	8.61	7.22	9.58	13.24	15.69	17.70	12.69
M2	6.87	8.73	9.67	8.93	9.17	8.67	9.23	9.58	10.14	11.11	12.54	10.52
Means	6.67	9.83	9.83	7.83	9.05		8.23	9.58	11.69	13.40	15.12	
SE (M)	0.73						0.80					
SE (T)	1.15						1.26					
SE (MT)	1.62						1.78					
CD M (5%)	NS						1.69					
CD T (5%)	NS						2.67					

CD MT (5%)	NS						3.77					
Treatments	Yield 25- 50g (t/ha)						Yield 50-75g (t/ha)					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M1	6.74	6.94	7.78	8.85	7.85	7.63	4.17	4.65	3.40	3.47	3.68	3.87
M2	4.17	4.62	6.32	6.80	7.43	5.87	3.68	4.03	3.12	4.31	4.31	3.89
Means	5.45	5.78	7.05	7.83	7.64		3.93	4.34	3.26	3.89	3.99	
SE (M)	0.59						0.61					
SE (T)	0.93						0.97					
SE (MT)	1.31						1.37					
CD M (5%)	1.24						NS					
CD T (5%)	NS						NS					
CD MT (5%)	NS						NS					
Treatments	Yield >75g (t/ha)						Total yield (t/ha)					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M1	2.77	2.15	3.75	1.74	2.29	2.54	21.46	22.59	24.03	27.48	29.97	25.11
M2	2.85	3.12	3.47	3.73	4.65	3.57	22.05	24.27	29.49	31.49	32.77	28.01
Means	2.81	2.64	3.61	2.74	3.47		21.75	23.43	26.76	29.49	31.37	
SE (M)	0.41						1.79					
SE (T)	0.65						2.83					
SE (MT)	0.92						4.00					
CD M (5%)	0.87						NS					
CD T (5%)	NS						5.99					
CD MT (5%)	NS						NS					
Treatments	Tuber yield on dry weight basis(t/ha)						Haulm yield on dry weight basis (t/ha)					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M1	4.19	4.49	4.84	5.57	6.06	5.03	3.07	2.81	2.80	3.40	3.59	3.14
M2	4.37	4.83	6.12	6.53	6.79	5.73	3.21	3.81	3.08	3.70	3.60	3.48
Means	4.28	4.66	5.48	6.05	6.43		3.14	3.31	2.94	3.55	3.60	
SE (M)	0.37						0.12					
SE (T)	0.59						0.20					
SE (MT)	0.83						0.28					
CD M (5%)	NS						0.26					
CD T (5%)	1.24						0.41					
CD MT (5%)	NS						NS					

**Table 787: Economics**

Treatment	Yield (t/ha)	Cost of cultivation (Rs/ha)			Cost (Rs/ha)		Sale price (Rs/t)	Net returns* (Rs/ha)	B:C ratio
		Seed	Fertilizer	Cultivation	Inputs	Produce			
M1T1	21.45	40000	9154	28792	77946	214500	10000	136554	1.75
M1T2	22.59	40000	9156	28792	77948	225900	10000	147952	1.90
M1T3	24.02	40000	9157	28792	77949	240200	10000	162251	2.08
M1T4	27.48	40000	9165	28792	77957	274800	10000	196843	2.53
M1T5	29.97	40000	9176	28792	77968	299700	10000	221732	2.84
M2T1	22.05	40000	9154	28792	77946	220500	10000	142554	1.83
M2T2	24.27	40000	9156	28792	77948	242700	10000	164752	2.11
M2T3	29.49	40000	9157	28792	77949	294900	10000	216951	2.78
M2T4	31.49	40000	9165	28792	77957	314900	10000	236943	3.04
M2T5	32.77	40000	9176	28792	77968	327700	10000	249732	3.20

## **AS PER TECHNICAL PROGRAMME 2015-16 (HILLS & KHARIF SEASON)**

### **AGRON.2: NITROGEN REQUIREMENT OF NEWLY RELEASED POTATO CULTIVARS (Testing/validating of ASNMP).**

The experiment was conducted at Dharwad and Srinagar.

**Table 788:** Experimental and treatments details at different locations.

Centers	Year	Design	Rep	Plot size Gross (m <sup>2</sup> )	Plot size Net (m <sup>2</sup> )	Variety	Date of Planting	Date of Haulm cutting	Date of Harvesting
DWD	2016-17	RBD	4	10.80	10.80	K Pukhraj	27.06.16	30.09.16	07.10.16
SRI	2016-17	RBD	4	12.96	4.80	V1: K Himalini V2: K Girdhari	10.03.16		12.07.16

### **Treatments**

1. Recently released potato Varieties
2. Nitrogen levels (kg/ha) : NO: 0 N1: 75 N2: 150 N3: 225 N4: 300

### **DHARWAD**

Plant emergence remained unaffected irrespective of level of nitrogen. Variety Kufri Pukhraj showed increased in total tuber yield with increase in level of nitrogen. Maximum tuber yield (19.89 t/ha) was produced with application 300 kg N/ha, which was statistically at par with tuber yield obtained by application of 225 kg N/ha (17.73 t/ha).

**Table 789:** Plant emergence (%), morphological traits and grade-wise tuber yield (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)				
				0-25g	25-50g	50-75g	>75g	Total
T1	91.25	49.13	3.80	0.58	2.09	3.50	5.22	11.39
T2	92.00	51.03	3.75	0.83	2.04	4.09	6.89	13.84
T3	92.75	52.85	4.05	1.36	1.51	4.00	8.29	15.16
T4	95.25	55.13	4.00	1.40	2.35	5.02	8.97	17.73
T5	92.50	55.40	3.95	1.35	2.69	6.16	9.68	19.89
SEd	1.47	1.44	0.23	0.17	0.34	0.75	0.98	1.33
CD(0.05)	NS	3.18	NS	0.37	0.74	1.65	2.16	2.93
CV%	2.24	3.87	8.16	21.69	22.15	23.28	17.75	12.07

### **SRINAGAR**

Variety Kufri Himalini and Kufri Girdhari produced maximum tuber yield of 32.76 t/ha and 35.60 t/ha respectively with 225 kg N/ha application. This tuber yield was at par with yield produced by application of 300 Kg N/ha in both the varieties. In both the varieties, significant increase in yield was observed with increase in level of nitrogen up to 225 kg/ha.

**Table 790:** Initial soil fertility status of the experimental plot before experiment

OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
1.59	7.25	131.25	48.125	248.5

OC\*= Organic carbon content of soil; Av = Available

**Table 791:** Plant emergence (%), morphological traits and grade-wise tuber yield (t/ha)

Treatments	Emergence (%)						Plant height (cm)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	91.11	92.05	94.22	95.74	89.92	92.61	31.35	34.44	33.44	38.60	32.25	34.02
V2	90.50	92.10	91.16	93.50	88.85	91.22	35.21	35.34	38.82	43.75	36.79	37.98
Means	90.81	92.08	92.69	94.62	89.39		33.28	34.89	36.13	41.18	34.52	
SE (V)	0.48						0.54					
SE (N)	0.75						0.86					
SE (VN)	1.06						1.22					
CD V (5%)	0.98						1.12					
CD N (5%)	1.55						1.78					
CD VN (5%)	NS						NS					
Treatments	No. of shoots/plant						Yield 0-25g (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	4.25	4.50	4.50	5.00	5.25	4.70	0.21	0.23	0.20	0.33	0.21	0.24
V2	4.00	4.25	5.00	5.25	5.50	4.80	0.22	0.27	0.25	0.36	0.43	0.31
Means	4.13	4.38	4.75	5.13	5.38		0.22	0.25	0.23	0.34	0.32	
SE (V)	0.09						0.008					
SE (N)	0.14						0.013					
SE (VN)	0.20						0.018					
CD V (5%)	NS						0.016					
CD N (5%)	0.29						0.026					
CD VN (5%)	0.42						0.037					
Treatments	Yield 25- 50g (t/ha)						Yield 50-75g (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	3.75	3.84	3.74	2.85	3.86	3.61	8.84	10.05	10.37	9.11	10.65	9.80
V2	2.80	2.61	3.64	2.76	2.95	2.95	6.86	10.66	11.62	10.22	9.84	9.84
Means	3.28	3.22	3.69	2.80	3.41		7.85	10.36	10.99	9.66	10.24	
SE (V)	0.06						0.14					
SE (N)	0.09						0.22					
SE (VN)	0.12						0.31					
CD V (5%)	0.11						NS					
CD N (5%)	0.18						0.45					
CD VN (5%)	0.25						0.64					
Treatments	Yield >75g (t/ha)						Total yield (t/ha)					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	9.83	12.73	14.49	20.48	16.39	14.78	22.64	26.85	28.80	32.76	31.12	28.43
V2	14.72	14.86	14.04	22.26	21.63	17.50	24.60	28.40	29.55	35.60	34.85	30.60
Means	12.27	13.79	14.26	21.37	19.01		23.62	27.62	29.17	34.18	32.98	
SE (V)	0.60						0.61					
SE (N)	0.94						0.97					
SE (VN)	1.33						1.37					
CD V (5%)	1.23						1.27					
CD N (5%)	1.94						2.00					
CD VN (5%)	2.75						NS					
Treatments	% Tuber dry Matter Content						% Haulm dry Matter Content					
	N0	N1	N2	N3	N4	Means	N0	N1	N2	N3	N4	Means
V1	18.92	19.26	19.50	19.10	19.25	19.21	14.60	16.80	19.20	17.50	16.30	16.88
V2	18.75	19.00	18.70	18.90	18.75	18.82	15.40	17.30	18.80	17.90	16.00	17.08
Means	18.83	19.13	19.10	19.00	19.00		15.00	17.05	19.00	17.70	16.15	
SE (V)	0.06						0.07					
SE (N)	0.10						0.12					
SE (VN)	0.13						0.16					
CD V (5%)	0.12						0.15					
CD N (5%)	0.20						0.24					
CD VN (5%)	0.28						0.34					

**Table 792:** Soil properties: N, P, K, removal (kg/ha) in each treatment

Treatments	Nutrients applied (kg/ha)			Nutrients removed (kg/ha)		
	N	P	K	N	P	K
V1N0	-	100	100	64	13.45	80.48
V1N1	120	100	100	112	15.48	82.54
V1N2	240	100	100	157	17.52	85.57
V1N3	360	100	100	166	19.28	88.65
V1N4	480	100	100	178	24.26	91.25
V2N0	-	100	100	62	14.92	81.24
V2N1	120	100	100	105	15.73	85.94
V2N2	240	100	100	161	18.21	87.64
V2N3	360	100	100	175	22.28	89.47
V2N4	480	100	100	180	25.65	92.73

### AGRON.3: DEVELOP SITE SPECIFIC NPK REQUIREMENTS

The experiment was conducted at Dharwad, Hassan and Shillong.

**Table 793:** Experimental and treatments details at different locations.

Center	Year	Design	Rep	Gross plot size (m <sup>2</sup> )	Net plot size (m <sup>2</sup> )	Variety	Spacing (cm)	Date of Planting	Date of Haulm cutting	Date of Harvesting
DWD	2016-17	RBD	4	10.08	10.08	K Pukhraj	60x20	27.06.16	30.09.16	07.10.16
HSN	2016-17	RBD	4	16.80	12.96	K Jyoti	60x20	23.06.16	11.09.16	21.09.16
SHI	2016-17	RBD	4	19.20	12.96	K Jyoti	60x20	16.02.16		25.06.16

#### Treatments of N, P, and K fertilizers

T1	50% RDF of NPK
T2	100% RDF of NPK
T3	150% RDF of NPK
T4	Without N fertilizer (PK)
T5	Without P (NK)
T6	Without K (NP)
T7	Without NPK (Absolute control)

#### DHARWAD

Plant emergence was unaffected irrespective of dose and omission of nutrient. Variety Kufri Pukhraj produced highest and significant tuber yield (22.65 t/ha) from 150% RDF of NPK followed by 100% RDF of NPK (15.89 t/ha). Application of N & P only produced the lowest yield as compared to application of NK and NP, it indicated that K was the most limiting nutrient at dharwad condition.

**Table 794:** Plant emergence (%), and grade-wise & total yield (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/plant	Grade-wise yield (t/ha)				
				0-25g	25-50g	50-75g	>75g	Total
T1	91.50	48.75	3.55	1.27	1.66	4.19	4.85	11.97
T2	90.75	55.73	3.75	1.29	2.70	4.95	6.95	15.89
T3	92.50	56.80	4.15	2.38	2.72	6.03	11.54	22.65
T4	93.75	46.20	3.90	1.44	2.09	4.63	6.98	15.13
T5	92.50	52.48	3.90	1.94	2.00	3.73	5.17	12.84
T6	92.25	55.18	3.95	0.76	1.83	3.65	5.07	11.30
T7	91.50	44.85	3.50	0.59	1.63	2.41	4.53	9.15
SEd	1.29	1.28	0.24	0.17	0.39	0.48	0.58	0.76
CD(0.05)	NS	2.71	NS	0.36	0.83	1.01	1.22	1.61
CV%	1.98	3.52	9.05	17.24	26.50	15.91	12.68	7.62

#### HASSAN

The maximum and significant tuber yield (22.74 t/ha) was recorded with 150 % recommended dose of N,P & K followed by with treatment receiving 100% of the recommended dose of NPK (20.49 t/ha). As compared to other treatments, Treatment without NPK and without N recorded lowest yield of 10.54 t/ha and 14.85 t/ha respectively. It indicated that, nitrogen was the most limiting nutrient for total yield production of Kufri Jyoti .

Recommended dose of N: P: K (kg/ha) : 75:75:100

**Table 795:** Plant emergence (%) and grade-wise & total yield (t/ha)

Treat-ments	Emer-gence (%)	Plant height (cm)	No. of shoots/ plant	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)		Late blight (%)
				0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm	
T1	86.11	51.70	2.10	0.72	1.95	3.48	7.14	13.28	19.16	4.02	4.01	4.99
T2	85.86	61.20	1.90	1.49	2.93	6.01	10.07	20.49	21.30	5.90	4.65	6.57
T3	84.48	60.20	2.60	1.88	3.29	6.73	10.84	22.74	21.71	6.61	4.89	3.14
T4	89.58	53.33	1.55	0.88	2.14	3.89	7.94	14.85	19.89	4.46	4.14	5.66
T5	89.52	51.88	1.95	1.12	2.68	5.51	8.89	18.20	20.58	5.27	4.38	5.11
T6	82.86	55.50	2.00	1.02	2.42	4.32	8.47	16.22	20.25	5.00	4.25	4.63
T7	86.11	52.55	1.65	0.51	1.59	2.38	6.06	10.54	18.49	3.41	3.85	5.88
SEd	3.40	3.07	0.22	0.11	0.18	0.42	0.58	0.74	0.28	0.16	0.11	1.90
CD(0.05)	NS	6.50	0.47	0.24	0.39	0.90	1.22	1.57	0.60	0.35	0.22	NS
CV%	5.56	7.87	16.00	14.79	10.66	13.00	9.62	6.30	1.97	4.66	3.46	52.29

**SHILLONG**

Kufri Jyoti produced maximum tuber yield of 22.16 t/ha with the application of 150 % recommended dose of N,P & K per hectare; however, this yield was statically insignificant as compared to rest of the treatments.

Recommended dose of N: P: K (kg/ha) : 140:120:60

**Table 796:** Plant emergence (%), grade-wise & total yield (t/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Plant height (cm)	No. of shoots/ plant	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
				0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	86.57	40.25	4.75	3.21	8.44	4.44	2.47	18.56	15.34	2.23	1.12
T2	88.66	42.50	5.00	3.29	9.83	5.75	2.83	21.70	13.83	2.60	1.44
T3	92.13	45.00	5.25	2.94	10.61	6.12	2.49	22.16	13.62	2.66	1.69
T4	87.73	33.75	3.75	4.01	9.65	4.10	1.56	19.31	13.11	2.32	0.97
T5	87.73	41.00	4.25	3.24	9.31	4.23	1.97	18.76	13.58	2.25	1.10
T6	83.80	40.00	4.75	2.90	9.88	5.41	1.74	19.93	14.23	2.39	1.16
T7	87.50	31.50	3.50	3.29	7.32	3.27	0.96	14.84	13.24	1.78	0.84
SEd	2.91	3.14	0.65	0.55	1.11	1.09	0.54	2.61	1.19	0.31	0.02
CD(0.05)	NS	6.65	NS	NS	NS	NS	1.15	NS	NS	NS	0.04
CV%	4.69	11.34	20.59	23.76	16.89	32.32	38.30	19.12	12.18	19.08	2.20



**AGRON. 4: OPTIMIZING PHOSPHORUS REQUIREMENTS OF POTATO UNDER CURRENT SCENARIO OF P USE BY THE FARMERS.**

**Table 797:** Experimental and treatments details.

Center	Year	Design	Rep	Gross plot size (m <sup>2</sup> )	Plot size (m <sup>2</sup> )	Spacing (cm)	Variety	Date of Planting	Date of Harvesting
SRI	2016-17	RBD	4	12.96	4.80	60X20	Shalimar potato-1	10.03.16	17.07.16

**Treatments**

- T1 : Farmer's practice (to be explained)
- T2 : Zero P ( control)
- T3 : 30 kg P<sub>2</sub>O<sub>5</sub>/ha
- T4 : 60 kg P<sub>2</sub>O<sub>5</sub>/ha
- T5 : 90 kg P<sub>2</sub>O<sub>5</sub>/ha
- T6 : 120 kg P<sub>2</sub>O<sub>5</sub>/ha
- T7 : Recommended dose of the region

Shalimar Potato -1 produced maximum tuber yield (34.85 t/ha) with the application of 90 kg P<sub>2</sub>O<sub>5</sub>/ha, which was at par with yield produced from application of 120 kg P<sub>2</sub>O<sub>5</sub>/ha (33.39 t/ha). Farmer's practice produced significantly low yield was compared to recommended dose of Phosphorous for Srinagar region.

**Table 798:** Initial soil fertility status of the experimental plot

OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
1.59	7.25	131.25	48.125	248.5

\*OC = Organic Carbon

**Table 799:** Plant emergence (%) and grade-wise yield (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Total
		0-25g	25-50g	50-75g	>75g		
T1	91.70	0.47	4.72	9.38	11.55	26.11	
T2	91.00	0.22	3.59	8.72	11.27	23.79	
T3	94.00	0.30	2.68	8.86	18.61	30.44	
T4	94.50	0.33	2.85	9.40	17.98	30.54	
T5	95.35	0.43	2.95	9.84	21.63	34.85	
T6	92.85	0.49	4.61	9.11	19.19	33.39	
T7	92.15	0.27	2.61	10.66	19.45	33.00	
SEd	0.74	0.02	0.11	0.30	0.60	0.77	
CD(0.05)	1.57	0.05	0.23	0.64	1.28	1.64	
CV%	1.13	9.49	4.49	4.56	5.00	3.61	

**Table 800:** Nutrient applied and removal (kg/ha) in each treatment

Treatments	Nutrients applied (kg/ha)			Nutrients removed (kg/ha)		
	N	P	K	N	P	K
T1	100	50	50	33.42	14.42	67.12
T2	160	-	100	29.96	11.23	54.86
T3	160	60	100	38.54	15.18	81.43
T4	160	80	100	42.65	15.87	84.28
T5	160	100	100	50.21	22.25	92.12
T6	160	120	100	49.82	17.49	90.53
T7	160	140	100	42.90	16.83	87.92

**AGRON.5 : ROLE OF BORON IN REDUCING TUBER CRACKING IN PROCESSING VARIETY KUFRI CHIPSONA-3**

**Table 801:** Experimental and treatments details at different locations.

Center	Year	Design	Rep	Gross plot size (m <sup>2</sup> )	Net plot size (m <sup>2</sup> )	Variety	Spacing (cm)	Date of Planting	Date of Haulm cutting	Date of Harvesting
DWD	2016-17	RBD	4	10.08	10.08	K Pukhraj	60x20	27.06.16	30.09.16	07.10.16

**Treatments (No FYM may be applied in all the treatments)**

- T1 : RDF of NPK only  
T2 : RDF of NPK + 2.0 kg B/ha as soil application  
T3 : RDF of NPK + 0.1% boric acid as foliar application at 40 DAP  
T4 : RDF of NPK + 0.1% boric acid as foliar application in two equal splits at 40 and 60 DAP  
T5 : RDF of NPK + 0.1% boric acid as foliar application in three times at 40, 50 and 60 DAP.

Kufri Pukhraj produced lowest cracked tuber yield (0.93 t/ha) when applied with recommended dose of NPK + 0.1% boric acid as foliar application three times 40, 50 and 60 DAP which was at par with cracked tuber yield (0.94 t/ha) produced with the application of RDF of NPK + 0.1% boric acid foliar application in two equal splits at 40 and 60 DAS and total tuber yield was also at par from both the treatments.

**Table 802:** Grade-wise yield (t/ha) and tuber rottage (t/ha)

Treatments	Emergence (%)	Grade-wise tuber yield (t/ha)					
		0-40g	40-100g	100-150g	>150g	Cracked	Total
T1	92.00	0.64	1.30	8.94	4.16	1.76	16.81
T2	92.50	0.93	2.23	9.75	6.15	1.39	20.44
T3	91.75	1.67	2.95	11.34	5.85	1.16	22.96
T4	90.75	1.61	3.01	10.62	6.03	0.94	22.21
T5	89.50	1.66	3.19	10.26	5.63	0.93	21.66
SEd	1.83	0.27	0.25	0.80	0.53	0.24	0.80
CD(0.05)	NS	0.59	0.55	NS	1.16	0.52	1.76
CV %	2.83	29.08	13.95	11.15	13.39	26.98	5.42

## AGRON.6: RESPONSE OF POTATO TO ZINC APPLICATION

The experiment was conducted at Dharwad, Hassan, Shillong and Srinagar centers.

**Table 803:** Experimental and treatments details at different locations.

Center	Year	Design	Rep	Gross plot size (m <sup>2</sup> )	Net plot size (m <sup>2</sup> )	Variety	Spacing (cm)	Date of Planting	Date of Haulm cutting	Date of Harvesting
DWD	2016-17	RBD	4	10.08	10.08	K Pukhraj	60x20	27.06.16	30.09.16	07.10.16
HSN	2016-17	RBD	4	16.80	9.00	K Jyoti	60x20	23.06.16	11.09.16	21.09.16
SHI	2016-17	RBD	4	14.40	9.00	K Jyoti	60x20	19.02.16		02.07.16
SRI	2016-17	RBD	4	12.96	4.80	Shalimar Potato-1	60x20	10.03.16		17.07.16

### **Treatments (No FYM may be applied in all the treatments)**

- T1 : RDF of NPK  
 T2 : RDF of NPK + 1.5kg Zn/ha  
 T3 : RDF of NPK + 3.0 kg Zn/ha  
 T4 : RDF of NPK + 4.5 kg Zn/ha  
 T5 : RDF of NPK + 6.0 kg Zn/ha

### **DHARWAD**

Zinc application had no response on plant emergence of variety Kufri Pukharaj at Dharwad conditions. Highest tuber yield (19.80 t/ha) was produced from RDF of NPK + 1.5 kg Zn/ha application however it was at par with 19.35 t/ha tuber yield produced with application of RDF on NPK+ 3.0 kg Zn/ha.

**Table 804:** Plant emergence (%) and grade-wise yield (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)				
		0-25g	25-50g	50-75g	>75g	Total
T1	92.50	1.54	1.42	3.91	7.19	14.04
T2	94.00	1.82	2.24	5.78	9.96	19.80
T3	92.00	1.68	1.90	4.82	10.96	19.35
T4	91.75	1.49	1.57	4.11	10.51	17.68
T5	87.50	0.37	1.28	3.97	9.79	15.39
SEd	2.35	0.21	0.26	0.42	0.84	1.02
CD(0.05)	NS	0.46	0.57	0.92	1.86	2.25
CV%	3.64	21.55	21.85	13.03	12.32	8.39

### **HASSAN**

Highest and significant tuber yield was produced with the application of RDF of NPK +6.0 kg Zn/ha followed by 18.62 t/ha tuber production with the application of RDF of NPK + 4.5 kg Zn/ha. Result showed that, tuber yield of 'Kufri Jyoti' had increased with increasing level of zinc. Similar trend was observed for Dry matter content, Tuber and haulm yield on dry weight basis.

Recommended dose of N: P: K (kg/ha) : 75:75:100

**Table 805:** Plant emergence (%), grade-wise yield (t/ha) dry matter content (%), tuber & haulm yield on dry weight basis (t/ha) and late blight (%)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)		Late blight (%)
		0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm	
T1	89.33	0.36	1.08	2.82	10.07	14.33	16.22	4.94	5.12	4.47
T2	89.00	0.52	1.41	3.24	10.56	15.72	16.93	5.26	5.60	2.67
T3	87.33	0.67	1.71	3.73	10.77	16.88	17.14	5.75	6.08	4.19
T4	88.66	0.86	2.15	4.18	11.43	18.62	17.68	6.83	6.26	5.14
T5	89.66	1.22	2.84	5.21	11.55	20.82	17.90	7.85	6.83	2.87
SEd	2.86	0.05	0.21	0.32	0.21	0.47	0.46	0.46	0.42	NS
CD(0.05)	NS	0.12	0.47	0.70	0.47	1.04	0.15	0.15	0.19	1.15
CV%	4.55	10.22	16.29	11.67	2.75	3.86	1.71	4.79	4.47	42.16

### SHILLONG

Application of RDK of NPK + 1.5 kg Zn/ha produced highest yield (24.86 t/ha); however this yield was statistically at par with rest of the other treatments. Similarly zinc application had no response for dry matter content, grade wise no of tubers and tuber, haulm yield on dry weight basis.

Recommended dose of N: P: K (kg/ha) : 140:120:60

**Table 806:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%) and tuber & haulm yield on dry weight basis (t/ha)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)
		0-25g	25-50g	50-75g	>75g	Total	
T1	83.00	2.79	8.38	9.56	3.42	24.14	14.60
T2	83.00	3.25	8.50	8.22	4.89	24.86	15.67
T3	81.34	2.79	7.82	8.48	3.80	22.89	14.77
T4	81.33	3.38	8.36	8.61	3.50	23.83	14.94
T5	88.00	3.31	8.15	8.03	3.38	22.86	15.29
SEd	3.59	0.56	0.74	1.19	1.04	1.94	0.94
CD(0.05)	NS	NS	NS	NS	NS	NS	NS
CV%	6.10	25.33	12.70	19.61	38.65	11.56	8.82

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Yield on dry weight basis (t/ha)	
	0-25g	25-50g	50-75g	>75g	Total	Tuber	Haulm
T1	230000	231111	136389	28333	625834	2.90	0.93
T2	231389	233889	127778	39166	632222	2.98	1.42
T3	225000	185000	119167	27223	556389	2.75	1.74
T4	273611	216111	124167	27500	641389	2.86	1.18
T5	262500	216389	114167	27500	620556	2.74	1.57
SEd	36580	23063	13520	8595	38833	0.23	0.06
CD(0.05)	NS	NS	NS	NS	NS	NS	0.14
CV%	21.16	15.07	15.38	40.59	8.93	11.56	6.62

### SRINAGAR

At Srinagar, plant emergence of variety Shalimar Potato-1 remained unaffected by zinc application. Application of recommended dose of NPK and 3.0 kg/ha Zinc produced highly significant tuber yield (36.24 t/ha) followed by yield (34.28 t/ha) produced with the application of 1.5 kg Zn/ha + RDF of NPK.

**Table 807:** Initial soil fertility status of the experimental plot

OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
1.59	7.25	131.25	48.125	248.5

\*OC = Organic Carbon

**Table 808:** Plant emergence (%), grade-wise yield (t/ha) & total number of tubers (no/ha) and tuber & haulm dry matter content (%)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Total no of tubers (no /ha)	Dry matter content (%)	
		0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	91.00	0.32	2.80	9.60	18.68	31.39	897917	17.84	14.89
T2	92.00	0.21	3.74	12.40	17.92	34.28	659896	19.02	14.92
T3	92.75	0.46	3.12	10.72	21.94	36.24	594792	19.22	15.25
T4	90.35	0.25	4.00	12.77	16.52	33.54	685417	19.08	15.63
T5	89.50	0.33	2.85	9.11	20.48	32.76	800000	19.51	18.04
SEd	1.12	0.02	0.11	0.16	0.80	0.69	33540	0.09	0.05
CD(0.05)	NS	0.04	0.24	0.36	1.76	1.53	73887	0.20	0.11
CV%	1.74	7.86	4.71	2.10	5.93	2.92	6.52	0.68	0.44

## AGRON. 6: WEED MANAGEMENT IN POTATO (FOR THE YEAR 2015)

**Table 809:** Experimental and treatments details at different locations.

Center	Year	Design	Rep	Gross plot size (m <sup>2</sup> )	Net plot size (m <sup>2</sup> )	Variety	Spacing (cm)	Date of Planting	Date of Harvesting
SRI	2016-17	RBD	4	12.96	4.80	Shalimar Potato-1	60x20	29.03.16	07.08.16

### Treatments

- T1 : Weedy Check  
 T2 : Weed Free  
 T3 : Hand weeding at 30 days and weed free upto maturity  
 T4 : Hand weeding at 40 days and weed free upto maturity  
 T5 : Hand weeding at 50 days and weed free upto maturity  
 T6 : Herbicides (Metribuzin @ 0.75kg/ha) pre-emergence  
 T7 : Herbicides (Metribuzin @ 0.75kg/ha) post-emergence at 10% of plant emergence

Hand weeding at 50 days and weed free up to maturity produced highest tuber yield of 34.44 t/ha of Shalimar potato-1 of which was statistically at par with tuber yield produced (34.28 t/ha) by hand weeding at 30 days and weed free up to maturity. Post emergence application of Metribuzin @0.75 kg/ha at 10 % of plant emergence proved better than its pre emergence application in terms of weed control as well as tuber yield.

**Table 810:** Grade-wise yield (t/ha), number of weeds (no/ha) and yield loss (%) by most prevalent weeds

Treatments	Grade-wise yield (t/ha)					No of weeds (no/ha) (Dicot/ Monocot)	Yield loss (%)
	0-25g	25-50g	50-75g	>75g	Total		
T1	0.47	4.72	9.38	11.55	26.11	23335	28.35
T2	0.28	2.57	11.86	21.74	36.44	0.00	0.00
T3	0.21	3.74	12.40	17.92	34.28	6784	5.92
T4	0.26	3.86	11.65	16.94	32.69	8783	7.41
T5	0.35	3.03	9.94	21.12	34.44	8154	4.36
T6	0.25	3.63	11.05	18.25	33.18	11662	8.94
T7	0.32	4.28	12.85	16.65	34.09	10323	7.95
SEd	0.03	0.21	0.66	1.11	1.07		
CD(0.05)	0.05	0.44	1.41	2.34	2.26		
CV%	11.62	8.01	8.31	8.81	4.57		

Weeds prevalent during the cropping period were *Chinopodium album*, *Amaranthus wild spp.* and *Partulaca*.

## AGRON. 9: DEVELOPMENT OF POTATO BASED ORGANIC FARMING SYSTEM

**Table 811:** Experimental and treatments details at different locations.

Center	Year	Design	Rep	Gross plot size (m <sup>2</sup> )	Net plot size (m <sup>2</sup> )	Variety	Spacing (cm)	Date of Planting	Date of Harvesting
SRI	2016-17	RBD	4	19.20	12.96	Shalimar Potato-1	60x20	10.03.16	17.07.16

### Treatment

- T1 : Absolute control  
 T2 : Inorganic practice standard technology  
 T3 : crop residue based: NADEP+Crop residue(green manuring)+ Biofertilizer(azotobacter & Phosphobacteria)+ Microbial culture  
 T4 : T3 + FYM @ 25 t/ha  
 T5 : T3 + Vermicompost @ 7.5 t/ha

With organic practices, Crop residue based: NADEP + Crop residue incorporation (green manuring) + biofertilizer (*Azotobacter* and *Phosphobacteria*) + microbial culture along with vermicompost application @ 7.5 t/ha produced maximum yield of 28.82 t/ha. Maximum marketable yield (31.38 t/ha) was recorded by following inorganic package of practices for potato cultivation at Srinagar conditions.

**Table 812:** Initial soil fertility status of the experimental plot.

OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
1.59	7.25	131.25	48.125	248.5

OC\*= Organic carbon content of soil; Av = Available

**Table 813:** Emergence (%), morphological traits, Non- marketable, marketable & total yield (t/ha) and tuber dry matter (%)

Treatment	Emergence (%)	Plant height (cm)	No. of shoots/plant	Non-marketable Yield (t/ha)	Marketable Yield (t/ha)	Total Yield (t/ha)	% Tuber dry matter
T1	80.50	38.50	4.95	4.26	20.35	24.61	18.02
T2	93.00	33.68	5.68	3.29	31.38	34.66	18.65
T3	90.00	37.14	4.72	3.55	27.33	30.88	19.68
T4	91.00	37.96	5.40	3.48	28.10	31.58	19.24
T5	91.50	34.69	3.37	3.93	28.82	32.74	19.10
SEd	2.23	0.96	0.26	0.31	0.37	0.34	0.18
CD(0.05)	4.91	2.11	0.58	NS	0.81	0.74	0.41
CV%	3.54	3.72	7.65	11.90	1.91	1.54	1.38

**Table 814:** Soil properties: N, P, K, removal (kg/ha) in each treatment

Treatments	Nutrients applied (kg/ha)			Nutrients removed (kg/ha)		
	N	P	K	N	P	K
T1	-	-	-	28.42	11.23	54.86
T2	160	100	100	58.96	27.49	84.74
T3	150	75	150	47.65	15.18	66.65
T4	275	132	250	51.82	16.50	79.43
T5	262	123	375	56.54	22.25	81.48

## AGRON. 10: DEVELOPMENT OF MICRONUTRIENT FORMULATION FOR POTATO

The experiment was conducted at Dharwad, Hassan, Ooty, Shillong and Srinagar centers.

**Table 815:** Experimental and treatments details at different locations.

Center	Year	Design	Rep	Gross plot size (m <sup>2</sup> )	Net plot size (m <sup>2</sup> )	Variety	Spacing (cm)	Date of Planting	Date of Haulm cutting	Date of Harvesting
DWD	2016-17	RBD	4	10.08	10.08	K Pukhraj	60x20	27.06.16	30.09.16	07.10.16
HSN	2016-17	RBD	4	16.80	12.96	K Jyoti	60x20	21.06.16	09.09.16	19.09.16
OOT	2016-17	SPT	3	9.00	9.00	V1: K Jyoti V2: K Himalini V3: K Giridhari V4: K Swarna	60x20	08.05.16		14.10.16
SHI	2016-17	RBD	4	15.12	10.80	K Jyoti	60x20	17.02.16		01.07.16
SRI	2016-17	RBD	4	19.20	12.96	Shalimar Potato-1	60x20	10.03.16		12.07.16

### Treatments

- T1 : Recommended practices followed in the region  
T2 : T1 + foliar spray of Boron (boric acid @ 500 ppm concentration)  
T3 : T1+ foliar spray of zinc (Zn SO<sub>4</sub> 7H<sub>2</sub>O @ 150ppm concentration)  
T4 : T1 + foliar spray of Boron + foliar spray of zinc  
T5 : Foliar spray of IHR Vegetable Special  
T6 : Potato specific nutrient formulation

**Spray schedule:** Spray schedule is common to all the treatments

- First spray : Plant establishment stage (Vegetative growth stage)  
Second spray : Tuber initiation stage  
Third spray : Tuber bulking stage

### **DHARWAD**

Recommended fertilization practices of Dharwad region for variety Kufri Pukhraj along three sprays at three different growth stages of potato specific formulations produced higher tuber yield (23.93 t/ha) which was at par with tuber yield (23.20 t/ha) produced by foliar application of zinc and boron together.

**Table 816:** Plant emergence (%) and grade-wise yield (t/ha) and tuber uniformity (1-5 scale)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Tuber uniformity (1-5 scale)
		0-25g	25-50g	50-75g	>75g	Total	
T1	92.00	1.49	1.91	5.98	9.26	18.64	3.00
T2	94.50	1.55	1.74	4.33	11.37	18.98	4.00
T3	93.25	1.37	3.02	5.36	10.58	20.33	3.00
T4	93.00	1.21	3.31	6.45	12.23	23.20	4.00
T5	91.25	2.18	2.46	4.93	12.27	21.85	4.00
T6	92.00	2.31	2.97	6.20	12.46	23.93	4.00
SEd	1.01	0.24	0.19	0.44	0.64	0.91	
CD(0.05)	NS	0.51	0.41	0.95	1.37	1.95	
CV%	1.55	19.71	10.53	11.24	7.90	6.07	



## HASSAN

Three sprays at three different growth stages of potato specific formulations + recommended fertilization practices of Hassan region for variety Kufri Jyoti produced highest tuber yield (21.69 t/ha) which was at par with tuber yield (20.93 t/ha) produced by RDF of NPK + three foliar application of zinc and boron together.

**Table 817:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha) and tuber uniformity (1-5 scale)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
		0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	86.64	0.92	1.20	2.68	12.89	17.69	18.93	3.28	3.81
T2	85.44	0.99	1.41	2.82	14.89	20.11	19.43	3.64	4.04
T3	84.75	1.02	1.60	3.15	15.80	21.56	20.08	3.97	4.13
T4	82.83	1.12	1.72	3.33	16.22	22.39	20.93	4.21	4.15
T5	87.39	1.16	1.80	3.66	17.47	24.09	20.81	4.52	4.23
T6	86.21	1.37	2.06	3.87	19.63	26.92	21.69	5.01	4.30
SEd	1.17	0.08	0.10	0.14	0.68	0.75	0.37	0.20	0.04
CD(0.05)	2.52	0.17	0.22	0.31	1.45	1.62	0.80	0.43	0.08
CV%	1.94	10.48	8.91	6.25	5.91	4.82	2.60	6.90	1.23

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Tuber uniformity (1-5 scale)	
	0-25g	25-50g	50-75g	>75g	Total	Colour	Shape
T1	60571	33951	22377	74653	191551	3.50	3.00
T2	65008	47840	29514	100309	242670	4.00	3.75
T3	80054	65008	39738	125386	310185	3.75	3.75
T4	94136	73881	48033	139275	355324	4.75	4.50
T5	111304	89506	59414	176698	436921	4.50	4.25
T6	131366	101466	68094	215664	516589	4.75	4.50
SEd	13682	3436	2589	8662	15140	0.31	0.36
CD(0.05)	29428	7391	5569	18631	32565	0.66	0.77
CV%	21.40	7.08	8.22	8.83	6.26	10.25	12.70

## OOTY

The Experimental results revealed that application of boron alone or in combination with zinc along with RDF had a significant effect on potato tuber yield. The highest tuber yield (19.73 t/ha) of Kufri Swarna was obtained with the application of RDF+ Foliar application of Zinc ( $ZnSO_4 \cdot 7H_2O$  @ 150 ppm) at three different growth stages and it was significantly higher than all other treatments for the same variety. 17.58 t/ha yield was produced with the application of Boron (boric acid @ 500 ppm) in variety Kufri Jyoti while foliar spray of potato specific formulation produced highest tuber yield (17.37 t/ha) in Kufri Himalini.

**Table 818:** Plant emergence (%), grade-wise yield (t/ha) & total number of tubers (no/ha) and tuber & haulm yield on dry weight basis (t/ha)

	Emergence (%)						
	T1	T2	T3	T4	T5	T6	Mean
K Jyoti	56.50	52.50	53.83	51.50	56.50	50.00	53.47
K Himalini	58.33	61.00	61.00	59.67	57.67	57.00	59.11
K Girdhari	57.33	58.67	57.67	49.33	58.00	54.33	55.89
K Swarna	62.67	65.33	64.33	60.67	57.33	60.67	61.83
Mean	58.71	59.38	59.21	55.29	57.38	55.50	
	CD (0.05)					SEd	
Varieties	2.88					1.16	
Treatment	2.36					1.17	
Treatment at same level of Variety	4.97					2.33	
Variety at same level of Treatment	5.17					2.42	

	Yield of tubers 0-25g (t/ha)						
K Jyoti	2.43	1.89	2.19	1.65	1.35	1.48	1.83
K Himalini	1.66	1.83	2.06	2.76	1.56	2.46	2.06
K Girdhari	1.48	1.72	1.40	2.62	2.05	1.73	1.83
K Swarna	1.46	1.50	1.58	1.65	1.64	1.75	1.59
Mean	1.76	1.73	1.81	2.17	1.65	1.85	
	CD (0.05)				SEd		
Varieties	NS				0.22		
Treatment	0.25				0.12		
Treatment at same level of Variety	0.56				0.25		
Variety at same level of Treatment	0.70				0.31		
	Yield of tubers 25-75g (t/ha)						
K Jyoti	7.54	7.03	6.59	5.07	6.45	6.97	6.61
K Himalini	5.43	7.13	6.11	5.67	5.02	6.88	6.04
K Girdhari	6.26	7.32	7.55	7.35	7.91	9.46	7.64
K Swarna	4.34	6.32	5.87	5.58	6.97	4.85	5.66
Mean	5.89	6.95	6.53	5.92	6.59	7.04	
	CD (0.05)				SEd		
Varieties	0.58				0.23		
Treatment	0.49				0.24		
Treatment at same level of Variety	1.03				0.49		
Variety at same level of Treatment	1.07				0.50		
	Yield of tubers >75g (t/ha)						
K Jyoti	7.16	8.66	3.09	7.52	8.75	6.45	6.94
K Himalini	8.42	6.91	8.17	5.98	7.30	8.02	7.47
K Girdhari	18.23	12.34	12.44	9.62	12.46	7.49	12.10
K Swarna	9.62	8.11	12.28	7.35	4.66	4.14	7.69
Mean	10.86	9.00	9.00	7.62	8.29	6.53	
	CD (0.05)				SEd		
Varieties	2.23				0.89		
Treatment	1.51				0.74		
Treatment at same level of Variety	3.22				1.48		
Variety at same level of Treatment	3.52				1.62		
	Total yield (t/ha)						
K Jyoti	17.14	17.58	11.87	14.24	16.55	14.89	15.38
K Himalini	15.52	15.87	16.34	14.41	13.87	17.37	15.56
K Girdhari	25.97	21.37	21.40	19.60	22.42	18.68	21.57
K Swarna	15.42	15.92	19.73	14.57	13.27	10.73	14.94
Mean	18.51	17.69	17.34	15.71	16.53	15.42	
	CD (0.05)				SEd		
Varieties	2.46				0.99		
Treatment	1.68				0.83		
Treatment at same level of Variety	3.59				1.65		
Variety at same level of Treatment	3.91				1.80		
	No of tubers 0-25g (no/ha)						
K Jyoti	138889	111111	145556	86296	75185	87778	107469
K Himalini	82963	110741	96296	88889	92593	138889	101728
K Girdhari	91852	92592	94444	135185	125926	122222	110370
K Swarna	80370	85926	87778	96296	116667	98148	94198
Mean	98519	100093	106019	101667	102593	111759	
	CD (0.05)				SEd		
Varieties	7917				3174		
Treatment	NS				6431		
Treatment at same level of Variety	26500				12863		
Variety at same level of Treatment	25059				12163		
	No of tubers 25-75g (no/ha)						
K Jyoti	118889	134444	125185	96296	119630	160741	125864
K Himalini	115926	134815	121111	96296	100370	118889	114568
K Girdhari	90370	135556	129630	92963	117778	135555	116975
K Swarna	71111	95556	60370	72222	114444	78148	81975

<b>Mean</b>	99074	125093	109074	89444	113056	123333	
	CD (0.05)				SEd		
Varieties	6405				2568		
Treatment	5758				2838		
Treatment at same level of Variety	12037				5677		
Variety at same level of Treatment	12263				5784		
	No of tubers >75g (no/ha)						
K Jyoti	68889	80000	25185	63333	76666	51852	60988
K Himalini	98889	56667	47778	42222	71111	68889	64259
K Girdhari	96667	103704	85556	80741	106667	62593	89321
K Swarna	86667	67407	88889	59630	40000	38148	63457
<b>Mean</b>	87778	76945	61852	61482	73611	55371	
	CD (0.05)				SEd		
Varieties	6902				2767		
Treatment	5437				2680		
Treatment at same level of Variety	11480				5361		
Variety at same level of Treatment	12038				5622		
	Total no of tubers (no/ha)						
K Jyoti	326667	325556	295555	245185	271111	300000	294012
K Himalini	297778	302222	265185	227407	264074	326667	280556
K Girdhari	278889	331852	309629	308889	350370	320370	316667
K Swarna	238148	248889	237037	228148	271111	214445	239630
<b>Mean</b>	285370	302130	276852	252407	289167	290370	
	CD (0.05)				SEd		
Varieties	12581				5043		
Treatment	18444				9092		
Treatment at same level of Variety	37605				18185		
Variety at same level of Treatment	35877				17350		
	Tuber yield on dry weight basis (t/ha)						
K Jyoti	0.96	1.32	0.92	1.08	1.23	0.97	1.08
K Himalini	0.94	0.96	1.11	0.91	1.01	1.01	0.99
K Girdhari	1.90	2.04	2.13	1.65	1.67	1.49	1.81
K Swarna	1.03	0.88	1.38	0.91	0.92	0.73	0.98
<b>Mean</b>	1.21	1.30	1.39	1.14	1.21	1.05	
	CD (0.05)				SEd		
Varieties	0.39				0.16		
Treatment	NS				0.15		
Treatment at same level of Variety	NS				0.31		
Variety at same level of Treatment	NS				0.32		
	Haulm yield on dry weight basis (t/ha)						
K Jyoti	0.41	0.73	0.86	0.76	0.50	0.51	0.63
K Himalini	0.85	0.72	0.78	0.52	0.70	0.82	0.73
K Girdhari	0.81	1.01	0.86	0.75	0.83	0.89	0.86
K Swarna	0.81	0.78	0.75	0.75	0.80	0.73	0.77
<b>Mean</b>	0.72	0.81	0.81	0.70	0.71	0.74	
	CD (0.05)				SEd		
Varieties	0.11				0.04		
Treatment	NS				0.05		
Treatment at same level of Variety	0.23				0.11		
Variety at same level of Treatment	0.23				0.11		

## SHILLONG

Three foliar sprays of potato specific formulations + recommended fertilization practices of Shillong region for variety Kufri Jyoti produced highest tuber yield (19.35 t/ha) which was at par with rest of the other treatments.

**Table 819:** Plant emergence (%), grade-wise yield (t/ha) & number of tubers (no/ha), dry matter content (%), tuber & haulm yield on dry weight basis (t/ha) and tuber uniformity (1-5 scale)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Dry matter content (%)	Yield on dry weight basis (t/ha)	
		0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	86.11	2.97	7.50	4.90	2.47	17.84	15.20	2.14	0.83
T2	91.11	2.82	5.80	6.67	2.70	17.99	15.97	2.16	0.78
T3	90.83	2.89	7.14	5.67	2.27	17.97	14.40	2.16	1.18
T4	85.56	3.27	7.30	5.12	2.60	18.29	14.38	2.20	1.32
T5	93.61	2.97	7.67	5.35	2.15	18.15	14.52	2.18	1.36
T6	88.89	2.68	7.13	6.14	3.40	19.35	15.76	2.32	1.42
SEd	2.39	0.39	1.01	0.80	0.51	1.33	0.73	0.16	0.03
CD(0.05)	5.14	NS	NS	NS	NS	NS	NS	NS	0.06
CV%	3.78	19.00	20.10	20.16	27.55	10.32	6.84	10.37	3.23

Table Contd.....

Treatments	Grade-wise number of tubers (no/ha)					Tuber uniformity (1-5 scale)	
	0-25g	25-50g	50-75g	>75g	Total	Colour	Shape
T1	225000	196759	68056	20602	510417	4.25	4.00
T2	239352	185417	97685	21296	543750	4.75	4.00
T3	224537	190741	80093	18750	514121	4.75	4.75
T4	309954	190509	75000	21759	597222	4.25	4.25
T5	295371	188657	80787	18056	582870	4.00	4.00
T6	322685	192824	96296	29167	640972	4.00	4.00
SEd	38132	32022	13596	4198	60085	0.44	0.45
CD(0.05)	NS	NS	NS	NS	NS	N/A	N/A
CV%	20.01	23.73	23.17	27.48	15.04	14.18	15.39

## SRINAGAR

RDF of NPK + three foliar application of zinc and boron together produced significantly highest tuber yield of 35.18 t/ha in variety Shalimar potato-1. Foliar application of Zinc ( $ZnSO_4 \cdot 7H_2O$  @ 150 ppm) and Boron (boric acid @ 500 ppm) alone produced tuber yield of 33.04 t/ha and 32.78 t/ha respectively.

**Table 820:** Initial soil fertility status of the experimental plot.

OC*	pH	Av N (Kg/ha)	Av P (Kg/ha)	Av K (Kg/ha)
1.59	7.25	131.25	48.125	248.5

OC\*= Organic carbon content of soil; Av = Available

**Table 821:** Plant emergence (%), grade-wise yield (t/ha) & total number of tubers (no/ha) and tuber & haulm dry matter content (%)

Treatments	Emergence (%)	Grade-wise yield (t/ha)					Total no of tubers (no /ha)	Dry matter content (%)	
		0-25g	25-50g	50-75g	>75g	Total		Tuber	Haulm
T1	90.56	0.32	2.80	9.59	18.69	31.40	640432	19.43	19.00
T2	94.92	0.33	2.85	9.12	20.49	32.78	668210	19.50	17.50
T3	90.78	0.23	3.74	10.83	18.25	33.04	635031	19.58	18.10
T4	93.54	0.22	3.63	13.06	18.28	35.18	576196	19.86	16.20
T5	92.59	0.20	3.72	8.62	18.97	31.52	546296	19.25	15.50
T6	93.66	0.20	2.93	9.40	19.12	31.66	623457	18.98	18.90
SEd	1.01	0.04	0.17	0.19	0.41	0.40	10597	0.08	0.32
CD(0.05)	2.17	0.08	0.37	0.40	0.88	0.86	22793	0.18	0.68
CV%	1.54	21.55	7.44	2.62	3.07	1.74	2.44	0.61	2.54

## CROP PROTECTION

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### PATHOLOGY

#### **PATH.1: MONITORING OF LATE BLIGHT AND A2 MATING TYPE OF *P. INFESTANS* IN STANDING CROP AND TUBERS AT HARVEST AND AFTER COLD STORAGE**

Monitoring for late blight appearance and its progress was undertaken in 13 locations during *rabi*, summer and *kharif* seasons.

During *rabi* 2016, late blight monitoring was undertaken in 9 locations, i.e. Faizabad, Jorhat, Kalyani, Kanpur, Kota, Patna, Pantnagar, Passighat and Pune. There was no late blight infection at Kota. At Faizabad, the disease appeared in all dates of planting in Kufri Chandramukhi. The disease appeared after 106, 69 and 59 days in first, second and third dates of planting, respectively. The intensity was highest (59%) in late planted crop. No tuber infection was observed at the time of harvest.

At Jorhat, the disease appeared in all dates of planting in Kufri Pukhraj. The disease appeared after 45, 39 and 35 days in first, second and third dates of planting, respectively. The intensity was up to 100 per cent. Tuber infection was observed at the time of harvest (21.20%) only.

At Kalyani, blight appeared in all dates of planting but appeared early in late planted crop i.e. 53 days after planting in Kufri Chandramukhi. The intensity of the disease was up to 54%. However, no tuber infection at harvest was observed.

At Kanpur, blight appeared in all dates of planting but detected early (69 days) in third date of planting in Kufri Chandramukhi. In first date of planting it appeared after 98 days of planting while in second date it appeared after 83 days. The intensity of the disease was up to 13%. Tuber infection ranged from 4.00% to 5.20% at harvest and up to 3.8% after storage.

At Pantnagar, disease appeared in all dates of planting but appeared early in third planting date i.e. 43 days after planting in Kufri Bahar. The intensity of the disease was up to 40%. However, no tuber infection at the harvest was observed.

At Passighat, blight appeared after 36 days of planting in third date of planting in Kufri Bahar. Blight appeared early in late planted crop and reached to the intensity of 31%. Tuber infection ranged from 7.5 to 14.5% at the time of harvest.

At Pune, blight appeared in all dates of planting but appeared early in third date of planting i.e. 38 days after planting in Kufri Bahar. The intensity of the disease was 57.62%.

During summer 2016, late blight monitoring was done at Ooty, Shillong and Srinagar. At Ooty, blight appeared early in third date of planting i.e. 26 days after planting. Highest disease severity was recorded in Kufri Jyoti followed by Kufri Swarna and Kufri Himalini. No disease was recorded in Kufri Girdhari.

At Shillong, blight appeared in all dates of planting in Kufri Jyoti. Blight appeared early (61 days of planting) in late planted crop and reached to the intensity of 100%. No tuber infection at harvest was recorded.

At Srinagar, Kufri Chandramukhi variety was grown and late blight appeared in all the dates of planting. Blight appeared early (62 days of planting) in early planted crop. The intensity of late blight ranged from 16.9 to 33.5% being lowest in early planted crop and highest in late planted crop. Incidence of tuber rot ranged from 4.9 to 8.3 % at the harvesting.

In *kharif* crop, monitoring was done at Hassan where disease appeared in all the dates of planting and intensity was up to 33%. Tuber infection was recorded at harvest (7.15 – 14.45%) and after cold storage (5.16 – 9.38%).

**Table 822:** Experimental details at different locations

Location	FZB	HSN	JRH	KAL	KAN	KTT
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Plot size m <sup>2</sup>	800	1000	150.00	588.00	20.00	1000
Planting 1 <sup>st</sup> date	11.10.16	20.05.16	15.11.16	13.11.16	16.10.16	29.10.16
Planting 2 <sup>nd</sup> date	20.11.16	11.06.16	25.11.16	28.11.16	31.10.16	15.11.16
Planting 3 <sup>rd</sup> date	30.11.16	15.07.16	03.12.16	13.12.16	15.11.16	01.12.16
Harvesting 1 <sup>st</sup>	-	28.08.16	10.02.17	15.02.17	10.02.17	18.02.17
Harvesting 2 <sup>nd</sup>	-	19.09.16	24.02.17	26.02.17	25.02.17	02.03.17
Harvesting 3 <sup>rd</sup>	-	20.10.16	25.02.17	12.03.17	12.03.17	16.03.17
Variety	KCM	K Jyoti	K Pukhraj	KCM	KCM	K Bahar

Table contd.....

Location	OOT	PAT	PNT	PAS	PUN	SHI	SRI
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Plot size m <sup>2</sup>	12.00	10.08	23.40	1000	100	30.00	12.96
Planting 1 <sup>st</sup> date	05.03.16	05.11.16	07.10.16	04.11.16	21.10.16	15.02.16	10.03.16
Planting 2 <sup>nd</sup> date	18.05.16	21.11.16	22.10.16	19.11.16	07.11.16	01.03.16	25.03.16
Planting 3 <sup>rd</sup> date	02.06.16	05.12.16	07.11.16	04.12.16	21.11.16	16.03.16	10.04.16
Harvesting 1 <sup>st</sup>	-	23.02.17	20.02.17	04.02.17	01.02.17	02.08.16	17.07.16
Harvesting 2 <sup>nd</sup>	-	15.03.17	25.02.17	19.02.17	15.02.17	02.08.16	01.08.16
Harvesting 3 <sup>rd</sup>	-	15.03.17	25.02.17	04.03.17	27.02.17	02.08.16	16.08.16
Variety		K Ashoka	K Bahar	K Bahar	K Bahar	K Jyoti	KCM

**Table 823:** Late blight intensity & incidence (%) and Incidence (%) in tuber after appearance at different centres

Centre	Date of 1 <sup>st</sup> appearance of LB	Incidence (%) at days				Intensity (%) at days				% Incidence of disease in tuber	
		7	14	21	28	7	14	21	28	At harvest (%)	After cold storage (%)
Faizabad	25.01.17	8.00	25.00	-	-	5.00	20.00	-	-	-	-
	28.01.17	10.00	22.00	53.00	85.00	7.00	24.00	42.00	55.00	-	-
	28.01.17	9.00	35.00	51.00	85.00	8.00	28.00	40.00	69.00	-	-
Hassan	-	10.00	22.85	46.72	62.18	3.33	9.91	14.44	18.88	7.15	5.16
	-	32.58	46.91	58.68	75.86	8.89	16.66	21.11	24.44	11.25	7.85
	-	31.28	52.46	68.00	84.28	9.10	22.22	26.66	33.33	14.45	9.38
Jorhat	30.12.16	100.00	100.00	100.00	100.00	12.25	60.50	100.00	100.00	21.20	-
	03.01.17	100.00	100.00	100.00	100.00	10.12	61.25	100.00	100.00	14.78	-
	07.01.17	71.00	100.00	100.00	100.00	8.68	41.60	94.35	100.00	11.25	-
Kalyani	31.1.17	23.63	36.55	51.40	0.00	15.40	20.16	32.72	0.00	-	-
	31.1.17	27.44	41.16	60.78	93.20	14.28	22.28	39.71	51.40	-	-
	04.2.17	26.46	39.70	73.42	95.48	17.53	28.52	40.62	54.32	-	-
Kanpur	22.01.17	4.00	5.12	10.00	12.00	6.00	8.00	9.00	10.00	5.20	3.10
	22.01.17	4.50	6.00	10.00	12.00	5.00	7.50	10.20	13.20	5.20	3.40
	22.01.17	3.00	6.50	7.50	13.20	3.50	7.00	6.00	8.00	4.00	3.80
Kota		Disease didn't appear									
Pantnagar	15.12.16	10.00	20.00	50.00	70.00	5.00	10.00	30.00	40.00	Nil	Nil
	12.11.16	5.00	10.00	30.00	50.00	5.00	10.00	20.00	35.00	Nil	Nil
	20.12.16	5.00	5.00	10.00	20.00	5.00	10.00	10.00	15.00	Nil	Nil
Passighat	13.12.16	8.90	13.40	17.20	19.40	9.50	10.00	13.50	18.20	11.00	0.00
	26.12.16	6.20	8.80	12.10	15.80	6.00	11.50	18.70	20.50	7.50	0.00
	09.01.17	22.50	31.50	35.50	36.40	24.50	20.50	29.50	31.50	14.50	0.00
Patna		Disease didn't appear									
Pune	29.12.16	21.36	37.27	46.36	47.99	14.22	30.20	43.55	54.09	Nil	Nil
	29.12.16	22.88	39.83	45.33	52.88	15.55	34.66	43.10	57.62	Nil	Nil
	29.12.16	15.41	27.75	34.36	33.32	11.55	21.77	30.21	40.52	Nil	Nil
Shillong	05.11.16	-	-	-	-	25.00	80.00	100.00	100.00	-	-

	13.5.16	-	-	-	-	20.00	70.00	80.00	100.00	-	-
	16.05.16	-	-	-	-	10.00	40.00	70.00	95.00	-	-
Srinagar	11.05.16	7.80	15.40	23.90	28.60	3.50	6.30	7.80	16.90	4.90	
	29.05.16	13.40	18.60	34.80	38.10	8.80	14.30	20.70	26.30	5.80	
	16.06.16	19.50	27.90	40.20	44.20	10.30	18.30	25.20	33.50	8.30	

### OOTY

**Table 824:** Late blight intensity & incidence (%) and date of first appearance of late blight

Date of first appearance of late blight	% Incidence (days after disease appearance)									
	6	19	26	29	34	41	47	55	74	
D1	06.08.16	13.06.16	27.06.16	04.07.16	07.07.16	12.07.16	19.07.16	25.07.16	03.08.16	22.08.16
	K Swarna	19.57	91.46	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	K Girdhari	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	K Himalini	1.08	60.07	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	K Jyoti	9.05	84.49	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	% Intensity									
	K Swarna	0.00	3.00	4.67	9.33	15.00	30.00	63.33	80.00	96.67
	K Girdhari	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	K Himalini	0.00	0.83	2.67	5.00	9.33	15.67	36.00	65.00	68.00
	K Jyoti	0.00	2.00	3.33	7.00	13.33	28.33	56.67	93.33	100.00

### Contd.....

Date of first appearance of late blight	% Incidence (days after disease appearance)									
	3	11	14	19	26	32	41	60		
D2	24.06.16	27.06.16	04.07.16	07.07.16	12.07.16	19.07.16	25.07.16	03.08.16	22.08.16	
	K Swarna	51.24	57.60	69.61	100.00	100.00	100.00	100.00	100.00	100.00
	K Girdhari	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	K Himalini	24.91	26.76	51.30	100.00	100.00	100.00	100.00	100.00	100.00
	K Jyoti	26.83	23.98	63.82	100.00	100.00	100.00	100.00	100.00	100.00
	% Intensity									
	K Swarna	0.00	2.00	3.67	8.33	30.00	70.00	95.00	100.00	100.00
	K Girdhari	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	K Himalini	0.00	1.00	2.00	3.67	7.00	31.67	53.33	69.00	69.00
	K Jyoti	0.00	1.33	2.00	6.33	23.33	76.67	100.00	100.00	100.00

### Contd.....

Date of first appearance of late blight	% Incidence (days after disease appearance)									
	7	10	15	22	28	36	55	61		
D3	28.06.16	04.07.16	07.07.16	12.07.16	19.07.16	25.07.16	03.08.16	22.08.16	28.08.16	
	K Swarna	45.20	58.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	K Girdhari	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	K Himalini	20.60	24.80	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	K Jyoti	30.00	25.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	% Intensity									
	K Swarna	1.00	5.00	8.00	25.00	65.00	80.00	96.00	100.00	100.00
	K Girdhari	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	K Himalini	0.00	1.05	2.00	3.67	7.00	31.67	53.33	61.33	61.33
	K Jyoti	1.00	5.00	8.00	25.30	71.20	89.00	100.00	100.00	100.00

For meteorological data please see Annexure-1

## PATH. 2: SURVEILLANCE OF IMPORTANT POTATO PESTS IN THE REGION (PEST CAPTURE PLOTS)

Incidence and intensity of major potato pests and diseases were recorded in 18 locations throughout the country using “pest capture plot” technique during 2016-17. The locations are Bhubaneshwar, Chhindwara, Deesa, Dholi, Faizabad, Hassan, Jorhat, Kalyani, Kanpur, Kota, Ooty, Pantnagar, Pasighat, Patna, Pune, Raipur, Shillong and Srinagar. The diseases recorded are late blight, early blight, Phoma leaf spot, bacterial wilt, mild mosaic, leaf roll, severe mosaic in standing crop and common scab, black scurf, and brown rot on harvest. Similarly, infestation of aphids, whiteflies, white grubs, PTM, thrips and other insect pests were recorded in different locations.

Late blight incidence was recorded from Chhindwara (19.5-25.2%), Dholi (10-60%), Faizabad (25-45%), Hassan (25-45.55%), Jorhat (18-100%), Kalyani (13.62-65.40%), Kanpur (4.5-10.5%), Ooty (0-67.25%), Pantnagar (100%), Pasighat (10.4-14.5%), Patna (78-88%), Pune (7.5-12.3%), Shillong (1.3-90%) and Srinagar (27.6-35.8%). Other centres did not report late blight incidence during 2016-17.

Early blight incidence was recorded from Bhubaneshwar (4.5-22.50%), Chhindwara (4.50-6.90%), Deesa (1.5-6.0%), Faizabad (0-30%), Hassan (20.23-26.18%), Kalyani (0-10.30%), Kanpur (4.5-12.4%), Kota (7-42%), Ooty (3-74.25%), Pantnagar (0-15.0%), Pasighat (2.2-8.3%), Pune (29.33-35.0%), Shillong (0-10%) and Srinagar (14.2-29.2%). The other centres viz., Dholi, Jorhat, Patna and Raipur did not report the incidence of early blight. Phoma leaf spot was also recorded from Bhubaneshwar (0.00-6.30%), Deesa (1-2.5%), Faizabad (7-15%), Kalyani (0-8.62%), Kanpur (3-4.0%), Pantnagar (0-50.0%), Pasighat (5.4-6.2%), Patna (11.3-59.9%) and Shillong (0-6.6%).

Different types of mosaics were also recorded from all the locations. Mild mosaic incidence ranged between 0.80-4.0% in Bhubaneshwar, 2.5-6.8% in Chhindwara, 0.5-2.0% in Deesa, 0-10% in Dholi, 14.0-24.0% in Hassan, 5.7-26.20% in Jorhat, 0-4.58% in Kalyani, 2.0-4.0% in Kanpur, 0-14% in Kota, 0-20% in Pantnagar, 4.0-4.4% in Pasighat, 3.8-12.3% in Patna, 2.06-2.9% in Pune and 7.81-38.02% in Raipur. Similarly, leaf roll incidence ranged from 1.20-4.8% in Bhubaneshwar, 3.9-4.5% in Chhindwara, 1.5-5.0% in Deesa, 0-5% in Dholi, 7-16% in Hassan, 3.1-27.60% in Jorhat, 5.0-8.0% in Kalyani, 2.0-3.5% in Kanpur, 6-25% in Kota, 0-10% in Pantnagar, 2.2-11.2% in Patna, 1.3-2.7% in Pune and 0-5.52% in Raipur. Incidence of severe mosaic was recorded between 3.4-4.7% in Chhindwara, 1.0-2.0% in Deesa, 0-20% in Dholi, 8.0-20% in Faizabad, 10-20% in Hassan, 4.78-6.25% in Kalyani, 0-10% in Pantnagar, 13.5-16.8% in Pasighat, 5.4-112.9% in Patna and 4-20.75% in Raipur.

Incidence of common scab ranged between 0.2-0.32% pitted type in Chhindwara, 5.71-32.50% russet type & 0-17.14% pitted type Deesa, 10.0-30.0% russet type in Faizabad, 0-2.0% russet type in Kalyani, 1.5-2.6% russet type & 1.2-2.0% pitted type in Kanpur, 10-85% in Ooty, 0-30% russet type in Pantnagar, 3-4.0% russet type & 3-5% pitted type in Passighat. Black scurf incidence ranged between 0-11.63% in Deesa, 0-15% in Dholi, 35-45% in Faizabad, 1.5-2.2% in Kanpur, 8-16% in Kota, 0-7.5% in Ooty, 0-50% in Pantnagar and 0-0.5% in Patna. Brown rot incidence ranged between 1.0-5.9% in Bhubaneshwar, 0.89-1.1% in Chhindwara and 1.09-6.81% in Shillong.

Insect-pests infestation was found in different locations in standing crop. However, at harvesting stage, potato tuber moth damage was recorded in Hassan (22.56-40.32%), Pasighat (9-17.5%) and Pune (3.4-6.72%). Tuber damage due to soil borne insects like cut worms in Jorhat (0-4.4%), Kalyani (0.6-5.22%), Kanpur (1.5-2.5%), Pasighat (4.0-7.0%) and Srinagar (2.4-6.4%); white grubs in Dholi (2-5%), Pasighat (11-15%), Shillong (4.66-15.66) and Srinagar (2.3-5.4%); mole cricket in Deesa (0-3.33%), Jorhat (2.3-4.7%) and Passighat (5-9%) and red ants in Jorhat (5.82-17.20%), Ooty (3-6%) and in Passighat (6.2-8.2%) were also recorded. Mite infestation was found in Ooty (0.5-7%) only.

**Table 825:** Experimental details at different locations

Location	BHN	CHN	DES	DHL	FZB	HSN
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Plot size(m <sup>2</sup> )	10.80	21.60	20.00	20.00	---	20.00
Spacing (cm)	60x20	60x20	50x20	60x20	60x20	60x20
Planting	17.11.16	08.11.16	16.11.16	25.12.16	19.11.16	06.11.16
Dehaulming	26.01.17	24.02.16	26.02.17	-	28.02.17	09.12.16
Harvesting	02.02.17	28.02.17	26.02.17	20.04.17	07.03.17	19.09.16



Varieties						
V1	K Khyati	K Bahar	K Badshah	K Pukhraj	K Bahar	K Jyoti
V2	K Lalima	K Ashoka	K Pukhraj	K Arun	K Ashoka	K Surya
V3	K Pukhraj	K Pukhraj	K Khyati	K Ashoka	K Pukhraj	K Himalini
V4	K Ashoka	K Pushkar	K Chipsona-3	K Lalima	K Anand	K Pukraj
V5	K Pushkar		K Surya	K Jyoti	K Lalit	
V6	K Jyoti					
V7	K Chipsona-3					
V8	K Surya					
V9	KCM					
V10	K Lalit					

Contd.....

Location	JRH	KAL	KAN	KTT	OOT	PNT
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Plot size m <sup>2</sup>	9.00	80.00	19.20	20.00	9.00	30.00
Spacing cm	50x20	60x20	60x20	60x20	60x20	60x20
Planting	20.11.16	08.12.16	25.10.16	29.10.16	14.06.16	17.10.16
Dehaulming	19.02.17	08.03.17	-	05.02.17	22.09.16	23.01.17
Harvesting	26.02.17	14.03.17	03.12.16	08.03.17	10.07.16	18.02.17
Varieties						
V1	K Giriraj	K Jyoti	K Chipsona-1	K Pushkar	K Jyoti	K Surya
V2	K Jyoti	K Surya	K Chipsona-2	K Surya	K Himalini	K Sadabahar
V3	K Pukhraj	K Shailja	K Chipsona-3	K Pukhraj	K Shilaja	K Khyati
V4	K Puskar	K Himalini	K Surya	K Bahar	K Surya	K Jyoti
V5	K Himalini		K Badshah	K Sinduri	K Pukhraj	K Pukhraj
V6	K Surya				K Khyati	K Chipsona
V7	K Ashoka				K Giridhari	
V8	K Shailja					
V9	K Lalima					
V10	K Khyati					

Contd.....

Location	PAS	PAT	PUN	RPR	SHI	SRI
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Plot size m <sup>2</sup>	20.00	10.08	10.00	6.00	10.00	12.96
Spacing cm	60x20	60x20	60x20	60x20	60x20	60x20
Planting	10.11.16	07.11.16	13.07.16	13.11.16	23.02.16	19.03.16
Dehaulming	10.02.17	08.03.17	29.09.16	12.01.17	-	-
Harvesting	15.02.17	18.03.17	07.10.16	19.01.17	08.09.16	28.07.16
Varieties						
V1	K Pukhraj	K Ashoka	K Jyoti	K Pukhraj	K Jyoti	Shalimar-2
V2	K Lalima	K Pukhraj	K Badashah	K Jyoti	K Megha	Shalimar-1
V3	K Jyoti	K Jyoti	K Surya	K Khyati	K Giridhari	K Jyoti
V4	K Sindhuri	K Kanchan	K Ashoka	K Surya	K Himsona	Gulmarg Special
V5		K Arun			K Giriraj	K Giriraj

## BHUBANESHWAR

**Table 826:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	0.00	12.50	3.50	0.00	0.00	0.00	8.80	4.20	0.00	0.00
V2	0.00	5.00	0.00	0.00	0.00	0.00	4.40	0.00	0.00	0.00
V3	0.00	9.60	6.30	0.00	0.00	0.00	6.20	4.60	0.00	0.00
V4	0.00	22.50	5.50	0.00	0.00	0.00	16.80	4.80	0.00	0.00
V5	0.00	6.90	1.00	0.00	0.00	0.00	7.20	1.50	0.00	0.00
V6	0.00	5.20	2.50	0.00	0.00	0.00	5.50	2.20	0.00	0.00
V7	0.00	4.50	0.00	0.00	0.00	0.00	3.10	0.00	0.00	0.00
V8	0.00	6.40	2.40	0.00	0.00	0.00	3.11	2.00	0.00	0.00

V9	0.00	16.80	5.90	0.00	0.00	0.00	15.40	5.40	0.00	0.00
V10	0.00	5.10	2.30	0.00	0.00	0.00	3.80	2.10	0.00	0.00

**Table 827:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	0.00	2.50	3.00	0.00	2.40	2.20	Own seed
V2	0.00	2.40	2.80	0.00	2.20	1.80	
V3	0.00	2.60	2.80	0.00	2.30	2.60	
V4	0.00	4.00	4.80	0.00	3.40	3.80	
V5	0.00	1.50	2.30	0.00	1.30	1.60	
V6	0.00	1.60	2.50	0.00	1.20	1.20	
V7	0.00	0.80	1.20	0.00	1.10	1.00	
V8	0.00	1.80	3.20	0.00	1.40	1.40	
V9	0.00	2.10	2.50	0.00	1.60	1.50	
V10	0.00	1.70	1.80	0.00	1.50	1.30	

**Table 828:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/ Insect pests	Name of Variety									
	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
<b>Soil borne diseases</b>										
Brown rot	4.2	1	2.2	3.6	2.6	3.1	1.4	3.2	3.4	5.9
<b>Insect pests</b>	<b>Nil</b>									

#### CHHINDWARA

**Table 829:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	20.60	4.50	0.00	0.00	0.00	3.20	0.30	0.00	0.00	20.60
V2	25.20	6.00	0.00	0.00	0.00	3.50	0.40	0.00	0.00	25.20
V3	19.50	6.90	0.00	0.00	0.00	2.90	0.50	0.00	0.00	19.50
V4	23.50	6.50	0.00	0.00	0.00	3.80	0.70	0.00	0.00	23.50

**Table 830:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	3.50	6.80	4.10	0.30	0.29	0.25	Own seed
V2	4.70	5.60	4.50	0.38	0.36	0.48	
V3	3.70	2.50	4.00	0.33	0.29	0.41	
V4	3.40	3.20	3.90	0.29	0.26	0.58	

**Table 831:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/ Insect pests	Name of Variety			
	V1	V2	V3	V4
<b>Soil borne diseases</b>				
<b>Common scab</b>				
1. Russet type	0.00	0.00	0.00	0.00
2. Pitted type	0.25	0.28	0.32	0.31
Black scurf	0.00	0.00	0.00	0.00
Brown rot	0.91	1.10	0.99	0.89
<b>Insect pests</b>	<b>NIL</b>			

## DEESA

**Table 832:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	0.00	1.50	1.00	0.00	0.00	0.00	3.33	1.11	0.00	0.00
V2	0.00	5.50	1.50	0.00	0.00	0.00	6.67	3.33	0.00	0.00
V3	0.00	6.00	2.00	0.00	0.00	0.00	6.67	4.44	0.00	0.00
V4	0.00	4.00	2.50	0.00	0.00	0.00	8.89	2.22	0.00	0.00
V5	0.00	2.00	1.50	0.00	0.00	0.00	4.44	2.22	0.00	0.00

**Table 833:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	1.00	0.50	1.50	2.20	3.30	1.10	own seed
V2	0.50	1.00	5.00	0.50	1.10	3.30	
V3	2.00	1.50	3.00	2.20	2.20	2.20	
V4	1.00	1.50	1.50	1.10	2.20	1.10	
V5	1.00	2.00	2.00	1.10	3.30	2.20	

**Table 834:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/ Insect pests	Name of Variety				
	V1	V2	V3	V4	V5
Soil borne diseases					
Common scab					
1. Russet type	32.50	5.71	10.00	9.30	27.78
2. Pitted type	0.00	17.14	0.00	2.32	0.00
Black scurf	0.00	0.00	6.67	11.63	5.55
Insect pests					
Mole cricket	0.00	0.00	3.33	0.00	0.00

## DHOLI

**Table 835:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	50.50	0.00	0.00	10.00	NA	50.00	0.00	0.00	10.00	NA
V2	30.00	0.00	0.00	5.00	NA	20.00	0.00	0.00	5.00	NA
V3	60.00	0.00	0.00	10.00	NA	60.00	0.00	0.00	10.00	NA
V4	10.00	0.00	0.00	5.00	NA	10.00	0.00	0.00	5.00	NA
V5	40.00	0.00	0.00	5.00	NA	50.00	0.00	0.00	5.00	NA

**Table 836:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	20.00	10.00	5.00	20.00	10.00	5.00	Local seed
V2	0.00	0.00	0.00	0.00	0.00	0.00	
V3	10.00	5.00	5.00	10.00	5.00	5.00	
V4	0.00	0.00	0.00	0.00	0.00	0.00	
V5	0.00	0.00	2.00	0.00	0.00	2.00	

**Table 837:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/ Insect pests	Name of Variety				
	V1	V2	V3	V4	V5
Soil borne diseases					
Black scurf	15.00	0.00	10.00	0.00	0.00
Brown rot	0.00	0.00	0.00	0.00	0.00
Insect pests					
White grubs	5.00	5.00	2.00	5.00	5.00
Any other pest	0.00	0.00	0.00	0.00	0.00

**FAIZABAD****Table 838:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	40.00	10.00	15.00	0.00	0.00	25.60	7.00	6.00	40.00	--
V2	45.00	0.00	15.00	0.00	0.00	30.50	0.00	7.50	45.00	
V3	25.00	0.00	7.00	0.00	0.00	18.50	0.00	5.00	25.00	
V4	25.00	15.00	10.00	0.00	0.00	19.00	9.00	4.80	25.00	
V5	30.00	30.00	10.00	0.00	0.00	20.60	22.00	4.00	30.00	

**Table 839:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	15.00	0.00	0.00	0.00	0.00	0.00	--
V2	18.00	0.00	0.00	0.00	0.00	0.00	
V3	8.00	0.00	0.00	0.00	0.00	0.00	
V4	10.00	0.00	0.00	0.00	0.00	0.00	
V5	20.00	0.00	0.00	0.00	0.00	0.00	

**Table 840:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/ Insect pests	Name of Variety				
	V1	V2	V3	V4	V5
Soil borne diseases					
Common scab					
1. Russet type	30.00	22.00	15.00	10.00	21.00
2. Pitted type	0.00	0.00	0.00	0.00	0.00
Black scurf	45.00	40.00	40.00	35.00	45.00
Insect pests	NIL				

**HASSAN****Table 841:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	45.55	25.66	0.00	16.66	0.00	26.66	0.00	0.00	0.00	0.00
V2	38.91	24.00	0.00	9.65	0.00	18.89	0.00	0.00	0.00	0.00
V3	25.00	20.23	0.00	7.33	0.00	14.44	0.00	0.00	0.00	0.00
V4	40.11	26.18	0.00	11.00	0.00	21.11	0.00	0.00	0.00	0.00

**Table 842:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	20.00	24.00	16.00	0.00	0.00	0.00	Modipuram
V2	16.00	17.00	11.00	0.00	0.00	0.00	
V3	10.00	14.00	7.00	0.00	0.00	0.00	
V4	18.00	20.00	13.00	0.00	0.00	0.00	

**Table 843:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/ Insect pests	Name of Variety			
	V1	V2	V3	V4
Insect pests				
PTM	40.32	28.25	22.56	30.00

**JORHAT****Table 844:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	100.00	0.00	0.00	1.80	0.00	100.00	0.00	0.00	0.00	0.00
V2	100.00	0.00	0.00	2.60	0.00	100.00	0.00	0.00	0.00	0.00
V3	100.00	0.00	0.00	2.10	0.00	100.00	0.00	0.00	0.00	0.00
V4	100.00	0.00	0.00	1.50	0.00	100.00	0.00	0.00	0.00	0.00
V5	18.00	0.00	0.00	2.70	0.00	11.50	0.00	0.00	0.00	0.00
V6	72.00	0.00	0.00	0.00	0.00	56.20	0.00	0.00	0.00	0.00
V7	100.00	0.00	0.00	3.20	0.00	100.00	0.00	0.00	0.00	0.00
V8		0.00	0.00		0.00		0.00	0.00	0.00	0.00
V9	100.00	0.00	0.00	2.30	0.00	100.00	0.00	0.00	0.00	0.00
V10	100.00	0.00	0.00	1.20	0.00	100.00	0.00	0.00	0.00	0.00

**Table 845:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	0.00	13.20	6.70	0.00	13.20	6.70	
V2	0.00	5.70	24.20	0.00	5.70	24.20	
V3	0.00	11.90	27.60	0.00	11.90	27.60	
V4	0.00	26.20	5.90	0.00	26.20	5.90	
V5	0.00	8.80	7.60	0.00	8.80	7.60	
V6	0.00	16.20	13.20	0.00	16.20	13.20	
V7	0.00	15.70	3.80	0.00	15.70	3.80	
V8	0.00	10.60	9.10	0.00	10.60	9.10	
V9	0.00	13.90	3.30	0.00	13.90	3.30	
V10	0.00	5.70	3.10	0.00	5.70	3.10	

**Table 846:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/ Insect pests	Name of Variety									
	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
Soil borne diseases	NIL									
Insect pests										
Cutworm	1.30	1.10	1.90	2.70	4.40	3.60	0.00	2.90	0.00	1.30
Red ant	11.60	14.70	17.20	10.90	8.50	13.00	13.20	7.90	14.60	5.80
Mole cricket	3.10	4.60	3.80	2.70	2.30	4.10	2.50	3.00	2.30	4.70

## KALYANI

**Table 847:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence				Percent intensity			
	Late Blight	Early blight	Phoma	Insect/ Pest*	Late Blight	Early blight	Phoma	Insect/ Pest*
V1	65.40	9.50	8.62	42 Ap, 34 EB	50.18	7.25	6.63	0.00
V2	58.16	6.25	DNA	38 Ap, 28 EB	38.23	5.52	DNA**	0.00
V3	13.62	DNA	DNA	13 Ap, 31 EB	9.62	DNA	DNA	0.00
V4	13.80	10.30	DNA	33 Ap, 32 EB	9.80	7.62	DNA	0.00

\*Ap = Aphid/100 compound leaf; EB = Epilachna beetle/10 fixed plant and \*\*DNA = Did not appear

**Table 848:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	6.25	3.28	7.3	4.43	2.75	5.66	-
V2	6.20	4.58	6.67	5.52	3.00	4.73	
V3	4.78	DNA	5.00	3.30	DNA	3.82	
V4	5.68	DNA	8.00	4.39	DNA	6.27	

**Table 849:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/ Insect pests	Name of Variety				
	V1	V2	V3	V4	V5
Soil borne diseases					
Common scab					
1. Russet type	1.1	0.0	0.7	2.0	
2. Pitted type	0.0	0.0	0.0	0.8	
Insect pests					
Cutworm	5.22	0.6	1.5	2.5	

## KANPUR

**Table 850:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	10.50	12.40	3.00	4.00	2.40	13.00	15.00	5.00	6.00	6.50
V2	9.00	11.00	3.50	3.00	2.00	10.00	13.00	6.00	4.00	4.00
V3	5.00	4.50	4.00	3.50	1.50	6.50	8.00	6.50	3.50	3.25
V4	4.50	5.00	4.00	3.00	2.50	6.50	8.00	4.00	2.50	2.00
V5	8.00	6.00	4.00	3.50	2.00	4.00	6.50	4.00	3.00	2.00

**Table 851:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	0.00	4.00	3.50	0.00	5.20	5.00	-
V2	0.00	3.00	3.20	0.00	4.80	4.00	
V3	0.00	2.50	2.80	0.00	3.90	3.50	
V4	0.00	3.50	2.10	0.00	4.00	2.85	
V5	0.00	2.00	2.00	0.00	3.00	2.40	

**Table 852:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/Insect pests	Name of Variety				
	V1	V2	V3	V4	V5
Soil borne diseases					
Common scab					
1. Russet type	1.50	2.10	1.80	2.30	2.60
2. Pitted type	1.50	2.00	1.20	2.00	2.00
Black scurf	1.50	2.00	1.50	2.00	2.20
Insect pests					
Cutworm	2.20	2.50	1.50	2.10	1.60
Any other pest	1.00	1.50	1.80	1.40	2.40

**KOTA****Table 853:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other*	Late Blight	Early blight	Phoma	Insect/ Pest	Other*
V1	0.00	27.00	0.00	Th Wf Ap	3.00	0.00	38.00	0.00		16.00
V2	0.00	22.00	0.00	Th Wf Ap	15.00	0.00	14.00	0.00		14.00
V3	0.00	33.00	0.00	Th Wf Ap	3.00	0.00	36.00	0.00		22.00
V4	0.00	42.00	0.00	Th Wf Ap	14.00	0.00	36.00	0.00		14.00
V5	0.00	7.00	0.00	Th Wf Ap	0.00	0.00	12.00	0.00		0.00

\* stem necrosis

**Table 854:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	0.00	12.00	6.00	0.00	0.00	0.00	Own seed
V2	0.00	0.00	15.00	0.00	0.00	0.00	
V3	0.00	5.00	25.00	0.00	0.00	0.00	
V4	0.00	14.00	23.00	0.00	0.00	0.00	
V5	0.00	0.00	6.00	0.00	0.00	0.00	

**Table 855:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/ Insect pests	Name of Variety				
	V1	V2	V3	V4	V5
Soil borne diseases					
Black scurf	12.00	8.00	15.00	16.00	9.00
Insect pests	NIL				

**OOTY****Table 856:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence				Percent intensity		
	Late Blight	Early blight	Bacterial wilt	Mites	Late Blight	Early blight	Bacterial wilt
V1	67.25	10.00	0.00	0.50	8.25	20.00	0.00
V2	63.75	3.00	0.00	4.50	4.75	5.00	0.00
V3	6.00	5.00	0.00	0.50	2.75	10.01	0.00
V4	5.00	74.25	0.00	0.75	2.45	16.25	0.00
V5	5.00	60.50	0.00	5.25	3.20	11.25	0.00
V6	16.25	4.00	0.00	7.00	3.00	10.20	0.00
V7	0.00	56.50	0.00	3.00	0.00	23.25	0.00

**Table 857:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe Mosaic	Mild Mosaic	Leaf roll	Severe Mosaic	Mild Mosaic	Leaf roll	
V1	0.00	0.00	0.00	0.00	0.00	0.00	CPRS, Kufri
V2	0.00	0.00	0.00	0.00	0.00	0.00	
V3	0.00	0.00	0.00	0.00	0.00	0.00	
V4	0.00	0.00	0.00	0.00	0.00	0.00	
V5	0.00	0.00	0.00	0.00	0.00	0.00	

**Table 858:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/ Insect pests	Name of Variety						
	V1	V2	V3	V4	V5	V6	V7
Soil borne diseases							
Common scab	10.00	12.00	11.00	85.00	20.00	11.00	16.00
Black scurf	0.00	0.00	0.00	7.5	0.00	0.00	0.00
Insect pests							
Red ant	4.00	5.00	3.00	4.00	5.00	4.00	6.00

**PANTNAGAR****Table 859:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	100.00	0.00	0.00	0.00	0.00	70.00	0.00	0.00	0.00	0.00
V2	100.00	15.00	0.00	0.00	0.00	60.00	15.00	0.00	0.00	0.00
V3	100.00	5.00	50.00	0.00	0.00	80.00	10.00	25.00	0.00	0.00
V4	100.00	5.00	5.00	0.00	0.00	80.00	20.00	10.00	0.00	0.00
V5	100.00	5.00	0.00	0.00	0.00	80.00	20.00	0.00	0.00	0.00
V6	100.00	0.00	0.00	0.00	0.00	70.00	0.00	0.00	0.00	0.00

**Table 860:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	2.00	0.00	0.00	0.00	0.00	0.00	Own seed
V2	0.00	6.00	0.00	0.00	0.00	0.00	
V3	10.00	20.00	5.00	0.00	0.00	0.00	
V4	0.00	0.00	0.00	0.00	0.00	0.00	
V5	5.00	20.00	10.00	0.00	0.00	0.00	
V6	0.00	0.00	0.00	0.00	0.00	0.00	

**Table 861:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/ Insect pests	Name of Variety					
	V1	V2	V3	V4	V5	V6
Soil borne diseases						
Common scab						
1.Russet type	20.00	10.00	30.00	10.00	20.00	0.00
2.Pitted type	0.00	0.00	0.00	0.00	0.00	0.00
Black scurf	50.00	40.00	50.00	30.00	30.00	0.00



## PASIGHAT

**Table 862:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	10.80	2.20	5.40	16.50	0.00	11.40	1.50	5.50	13.50	0.00
V2	13.20	6.80	6.20	13.00	0.00	14.40	6.50	7.20	11.50	0.00
V3	10.40	8.30	5.80	16.00	0.00	12.50	8.00	6.40	14.50	0.00
V4	14.50	7.60	6.10	16.20	0.00	12.50	5.20	4.50	12.00	0.00

**Table 863:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	16.40	4.00	0.00	12.50	4.80	0.00	Own seed
V2	15.20	4.40	0.00	13.20	4.00	0.00	
V3	13.50	4.20	0.00	11.50	6.50	0.00	
V4	16.80	4.00	0.00	14.60	3.70	0.00	

**Table 864:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/Insect pests	Name of Variety			
	V1	V2	V3	V4
Soil borne diseases				
Common scab				
1. Russet type	3.50	3.00	4.00	3.00
2. Pitted type	3.00	4.00	5.00	5.00
Insect pests				
White grubs	12.00	14.00	15.00	11.00
Cutworm	5.00	4.00	7.00	5.00
Red ant	8.20	7.50	6.20	8.00
Mole cricket	5.00	9.00	7.00	5.60
PTM	9.00	11.20	13.00	17.50

## PATNA

**Table 865:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	0.00	0.00	11.30	0.00	0.00	0.00	0.00	2.00	0.00	0.00
V2	0.00	0.00	14.70	0.00	0.00	0.00	0.00	0.70	0.00	0.00
V3	0.00	0.00	59.90	0.00	0.00	0.00	0.00	23.20	0.00	0.00
V4	0.00	0.00	32.40	0.00	0.00	0.00	0.00	4.40	0.00	0.00
V5	0.00	0.00	11.80	0.00	0.00	0.00	0.00	1.20	0.00	0.00

**Table 866:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	6.44	11.20	8.90	4.20	5.20	3.20	Own seed
V2	12.90	12.30	11.20	7.40	5.40	8.20	
V3	5.90	5.80	7.70	8.80	8.30	2.80	
V4	6.10	3.80	2.20	5.80	12.30	5.20	
V5	5.40	4.80	4.80	4.40	8.50	4.80	

**Table 867:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/ Insect pests	Name of Variety				
	V1	V2	V3	V4	V5
Soil borne diseases					
Black scurf	0.50	0.00	0.00	0.00	0.00
Insect pests	NIL				

**PUNE****Table 868:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	12.30	32.17	0.00	0.00	0.00	18.00	19.50	0.00	0.00	0.00
V2	10.33	31.15	0.00	0.00	0.00	22.10	17.50	0.00	0.00	0.00
V3	7.50	29.33	0.00	0.00	0.00	12.20	18.00	0.00	0.00	0.00
V4	9.70	35.00	0.00	0.00	0.00	14.60	21.00	0.00	0.00	0.00

**Table 869:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	0.00	2.60	1.30	0.00	1.79	2.00	Own seed
V2	0.00	2.90	2.70	0.00	2.60	1.50	
V3	0.00	2.06	1.50	0.00	1.80	1.20	
V4	0.00	2.60	2.70	0.00	2.60	2.10	

**Table 870:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/Insect pests	Name of Variety			
	V1	V2	V3	V4
Soil borne disease	NIL			
Insect pests				
PTM (mines/3 Plants)	6.72	5.90	3.40	4.20
Spodoptera (/square mt)	0.90	1.10	0.70	0.10

**RAIPUR****Table 871:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	0.00	0.00	0.00	41.28	24.00	0.00	0.00	0.00	0.00	0.00
V2	0.00	0.00	0.00	22.45	11.00	0.00	0.00	0.00	0.00	0.00
V3	0.00	0.00	0.00	40.21	12.00	0.00	0.00	0.00	0.00	0.00
V4	0.00	0.00	0.00	21.14	5.00	0.00	0.00	0.00	0.00	0.00
V5	0.00	0.00	0.00	41.52	18.00	0.00	0.00	0.00	0.00	0.00
V6	0.00	0.00	0.00	15.63	7.50	0.00	0.00	0.00	0.00	0.00
V7	0.00	0.00	0.00	55.19	26.00	0.00	0.00	0.00	0.00	0.00
V8	0.00	0.00	0.00	32.32	12.00	0.00	0.00	0.00	0.00	0.00

**Table 872:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	15.25	21.18	3.21	45.82	35.16	6.81	AICRP- POTATO CENTRE
V2	4.00	7.81	0.00	3.91	5.21	0.00	
V3	20.47	38.02	1.53	48.51	55.12	5.92	
V4	8.46	12.54	0.16	15.21	13.38	0.10	
V5	19.87	21.74	3.61	30.14	52.45	14.12	
V6	5.35	10.24	1.02	10.63	8.79	1.00	
V7	20.75	34.21	5.52	40.56	41.38	14.71	
V8	9.54	12.71	0.95	10.64	11.36	5.42	

**Table 873:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/ Insect pests	Name of Variety							
	V1	V2	V3	V4	V1	V2	V3	V4
Soil borne diseases	NIL							
Insect pests								
Any other pest	12.88	7.15	8.92	4.9	16.37	9.87	13.35	6.11

**SHILLONG****Table 874:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	90.00	0.00	4.00	2.00	0.00
V2	10.66	0.00	3.00	9.00	0.00
V3	1.30	10.00	6.60	3.00	0.00
V4	16.66	0.00	0.00	3.00	0.00
V5	83.33	0.00	4.60	4.00	0.00

**Table 875:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	0.00	0.00	0.00	0.00	0.00	0.00	Own seed
V2	0.00	0.00	0.00	0.00	0.00	0.00	
V3	0.00	0.00	0.00	0.00	0.00	0.00	
V4	0.00	0.00	0.00	0.00	0.00	0.00	
V5	0.00	0.00	0.00	0.00	0.00	0.00	

**Table 876:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/Insect pests	Name of Variety				
	V1	V2	V3	V4	V5
Soil borne diseases					
Brown rot	3.36	1.09	6.81	1.05	1.22
Insect pests					
White grubs	7.33	11.66	4.66	7.33	15.66

Note: For white grubs, their numbers have been counted and data provided is average number per plot

**SRINAGAR**

**Table 877:** Percent incidence and intensity of diseases and insect pests on standing crop

Variety	Percent incidence					Percent intensity				
	Late Blight	Early blight	Phoma	Insect/ Pest	Other	Late Blight	Early blight	Phoma	Insect/ Pest	Other
V1	27.6	14.2	0.00	0.00	0.00	12.3	4.8	0.00	0.00	0.00
V2	30.8	20.3	0.00	0.00	0.00	13.6	11.2	0.00	0.00	0.00
V3	35.8	29.2	0.00	0.00	0.00	18.9	17.1	0.00	0.00	0.00
V4	34.6	22.9	0.00	0.00	0.00	17.8	15.4	0.00	0.00	0.00
V5	32.7	21.0	0.00	0.00	0.00	16.5	11.6	0.00	0.00	0.00

**Table 878:** Percent incidence and intensity of viruses recorded on standing crop

Variety	Percent incidence			Percent intensity			Source of seed
	Severe mosaic	Mild Mosaic	Leaf roll	Severe mosaic	Mild Mosaic	Leaf roll	
V1	0.00	0.00	0.00	0.00	0.00	0.00	-----
V2	0.00	0.00	0.00	0.00	0.00	0.00	
V3	0.00	0.00	0.00	0.00	0.00	0.00	
V4	0.00	0.00	0.00	0.00	0.00	0.00	
V5	0.00	0.00	0.00	0.00	0.00	0.00	

**Table 879:** Incidence (%) of soil and tuber borne diseases/insect pests recorded at harvest

Diseases/Insect pests	Name of Variety				
	V1	V2	V3	V4	V5
Soil borne diseases	NIL				
Insect pests					
White grubs	5.4	3.6	4.2	2.7	2.3
Cutworm	3.5	2.4	3.4	4.8	6.4
Aphids	2.8	3.6	3.0	2.2	3.1

### PATH.3: SCHEDULING OF FUNGICIDE APPLICATION FOR THE MANAGEMENT OF LATE BLIGHT

It is essential to find out effective fungicidal formulation for the management of late blight in a continuous basis as the pathogen is highly variable and adapts quickly to new fungicidal formulations and host genotypes. With this in mind, an experiment was conducted to find out suitable spray schedule for effective management of late blight. The experiment was conducted in 6 locations, i.e. Faizabad, Hassan, Kalyani, Patna, Pantnagar and Srinagar.

**Table 880:** Experimental and treatments details at different locations.

Centre	FZB	HSN	KAL	PAT	PNT	SRI
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Design	RBD	RBD	RBD	RBD	RBD	RBD
Spacing (cm)	60X20	60X20	60X20	60X20	60X20	60X20
Gross Plot size (m <sup>2</sup> )	6.00	6.00	6.00	10.08	6.00	12.96
Date of Planting	18.11.16	25.06.16	03.12.16	17.11.16	18.10.16	20.03.16
Date of Harvesting	03.01.17	03.10.16	10.03.17	19.03.17	20.02.16	29.07.16
Variety	V1 V2	K Ashoka K Pukhraj	K Jyoti -	K Jyoti KCM	K Jyoti K Ashoka K Sutlej	K Bahar K Jyoti K Badshah

#### Treatments

- T1 : Prophylactic spray (just at the time of canopy closure) with chlorothalonil @ 0.25% followed by two more sprays at weekly intervals.
- T2\* : Prophylactic spray (just at the time of canopy closure) with chlorothalonil @ 0.25% followed by cymoxanil/dimethomorph/fenamidone+mancozeb @ 0.3% and one more spray with chlorothalonil @ 0.25% .
- T3 : Prophylactic spray (just at the time of canopy closure) with mancozeb @0.2% followed by dimethomorph/fenamidone/cymoxanil + mancozeb @ 0.3% followed by mancozeb.
- T4 : Control.
- \* Choose best fungicide as per the recommendation for particular location

**Table 881:** First appearance of late blight at different locations

Centers & Variety	Treatments			
	T1	T2	T3	T4
<b>Faizabad</b>				
K Ashoka	27.01.17	27.01.17	27.01.17	27.01.17
K Pukhraj	02.01.17	02.01.17	02.01.17	02.01.17
<b>Hassan</b>				
K Jyoti	29.07.16	29.07.16	29.07.16	30.07.16
<b>Kalyani</b>				
K Jyoti	02.02.17	02.02.17	01.02.17	31.01.17
KCM	02.02.17	02.02.17	31.01.17	31.01.17
<b>Patna</b>				
K Jyoti	Did not appear			
K Ashoka				
<b>Pantnagar</b>				
K Bahar	07.12.16	07.12.16	07.12.16	07.12.16
K Sutlej	10.12.16	10.12.16	10.12.16	10.12.16
<b>Srinagar</b>				
K Jyoti	19.06.16	21.06.16	18.06.16	16.06.16
K Badshah	10.06.16	14.06.16	09.06.16	03.06.16

## FAIZABAD

Late blight appeared after 45 days of planting in Kufri Pukhraj and 70 days after planting in Kufri Ashoka. Blight appeared in all the treatments on the same dates. Minimum intensity (1.51%) of blight was recorded in the treatment where prophylactic spray of chlorothalonil followed by fenamidone+mancozeb and one more spray of chlorothalonil (T2) was given followed by T3 (prophylactic spray of mancozeb followed by fenamidone+mancozeb and one more spray of mancozeb) compared to control (7.50%) on first date of observation i.e. 7 days after first appearance, which increased to 4.40% and 5.24% compared to control (17.50%) on second date of observation, respectively. On last date of observation i.e. 21 days after appearance, minimum intensity of late blight (31.37%) was recorded in the treatment where prophylactic spray of chlorothalonil followed by fenamidone+mancozeb and one more spray of chlorothalonil (T2) was given. The next best treatment was prophylactic spray of mancozeb followed by fenamidone+mancozeb spray (T3) and these two treatments are statistically on par with each other. Maximum yield (28.54t/ha) was recorded in T2 followed by T3 treatment.

**Table 882:** Late blight incidence (%) at 7 days interval (after appearance) and total tuber yield (t/ha) at maturity.

Treatments	Actual values									
	Percent incidence of late blight at 7 days					Percent incidence of late blight at 14 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	2.50	1.80	2.00	6.80	3.28	12.00	5.99	8.00	32.00	14.50
V2	0.00	0.00	0.00	4.00	1.00	4.00	2.50	3.01	14.99	6.13
Means	1.25	0.90	1.00	5.40		8.00	4.25	5.51	23.50	
SE (V)	0.29					0.24				
SE (T)	0.41					0.33				
SE (VT)	0.58					0.47				
CD (V)	0.60					0.48				
CD (T)	0.85					0.68				
CD (VT)	NS					0.97				
Treatments	Percent incidence of late blight at 21 days					Percent intensity of late blight at 7 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
	V1	40.00	30.00	35.00	80.00	46.25	5.00	3.02	3.52	10.00
V2	35.00	21.99	27.92	55.00	34.98	0.00	0.00	0.00	5.00	1.25
Means	37.50	26.00	31.46	67.50		2.50	1.51	1.76	7.50	
SE (V)	0.75					0.08				
SE (T)	1.06					0.11				
SE (VT)	1.50					0.16				
CD (V)	1.54					0.16				
CD (T)	2.18					0.23				
CD (VT)	3.08					0.33				
Treatments	Percent intensity of late blight at 14 days					Percent intensity of late blight at 21 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
	V1	8.49	5.80	6.48	20.00	10.19	45.00	35.00	35.90	60.00
V2	4.48	3.00	4.00	15.00	6.62	36.00	27.74	28.74	48.14	35.16
Means	6.49	4.40	5.24	17.50		40.50	31.37	32.32	54.07	
SE (V)	0.17					0.73				
SE (T)	0.24					1.04				
SE (VT)	0.33					1.47				
CD (V)	0.34					0.73				
CD (T)	0.49					1.04				
CD (VT)	0.69					1.47				
Treatments	Total yield (t/ha)					Blighted tuber yield (t/ha)				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
	V1	22.47	26.59	24.50	18.50	23.02	0.92	0.75	0.83	1.67
V2	25.97	30.49	28.01	21.50	26.49	0.79	0.59	0.57	1.29	0.81
Means	24.22	28.54	26.26	20.00		0.85	0.67	0.70	1.48	
SE (V)	0.46					0.02				
SE (T)	0.64					0.02				

SE (VT)	0.91					0.03				
CD (V)	0.94					0.04				
CD (T)	1.33					0.05				
CD (VT)	NS					0.07				
Treatments	Total no of tubers (no/ha)					Number of blighted tuber (no/ha)				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	643000	759333	701333	528000	657917	25000	15000	21667	53333	28750
V2	741334	869667	799667	613000	755917	21333	8666	11667	36667	19583
Means	692167	814500	750500	570500		23167	11833	16667	45000	
SE (V)	12253					481				
SE (T)	17328					681				
SE (VT)	24505					963				
CD (V)	25228					991				
CD (T)	35678					1401				
CD (VT)	NS					1982				
<b>Arcsine transformed values</b>										
	Percent incidence of late blight at 7 days					Percent incidence of late blight at 14 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	9.09	7.71	8.13	14.80	9.93	20.25	14.16	16.42	34.43	21.32
V2	0.00	0.00	0.00	11.53	2.88	11.53	9.09	9.99	22.77	13.34
Means	4.55	3.85	4.06	13.16		15.89	11.62	13.20	28.60	
SE (V)	0.40					0.18				
SE (T)	0.56					0.25				
SE (VT)	0.79					0.35				
CD (V)	0.81					0.36				
CD (T)	1.15					0.51				
CD (VT)	1.63					0.72				
Treatments	Percent incidence of late blight at 21 days					Percent intensity of late blight at 7 days				
	T1	T2	T3	T4	Means					
V1	39.21	33.19	36.25	63.51	43.04	12.91	10.00	10.81	18.42	13.04
V2	36.25	27.94	31.88	47.85	35.98	0.00	0.00	0.00	12.91	3.23
Means	37.73	30.57	34.07	55.68		6.46	5.00	5.40	15.67	
SE (V)	0.50					0.09				
SE (T)	0.71					0.13				
SE (VT)	1.00					0.18				
CD (V)	1.03					0.19				
CD (T)	1.45					0.27				
CD (VT)	2.06					0.37				
Treatments	Percent intensity of late blight at 14 days					Percent intensity of late blight at 21 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	16.92	13.93	14.74	26.55	18.04	42.11	36.25	36.79	50.76	41.48
V2	12.21	9.97	11.53	22.77	14.12	36.85	31.76	32.40	43.92	36.23
Means	14.57	11.95	13.13	24.66		39.48	34.01	34.60	47.34	
SE (V)	0.15					0.43				
SE (T)	0.22					0.61				
SE (VT)	0.31					0.87				
CD (V)	0.32					0.89				
CD (T)	0.45					1.27				
CD (VT)	0.64					NS				

## HASSAN

Late blight appeared after 34 days of planting in Kufri Jyoti. Blight appeared in all the treatments on the same date. Blight appeared in all treatments and minimum intensity of late blight (7.46%) was recorded in the treatment where prophylactic spray of chlorothalonil followed by fenamidione+mancozeb and one more spray of chlorothalonil (T2) followed by T3 on first date of observation, which increased to 13.40, 14.31 and 15.87% on fourth, fifth, and sixth date of observations, respectively. On last date of observation i.e. 49 days after appearance, minimum intensity of late blight (17.59%) was recorded again in the same treatment (T2) as against of 42.55% in the control. The next best treatment was prophylactic spray of mancozeb followed by

fenamidone+mancozeb and one more spray of mancozeb (T3). Maximum yield (17.96 t/ha) was recorded in T2 followed by T3 (14.84 t/ha) treatment.

**Table 883:** Late blight incidence and intensity (%) at 7 days interval (after appearance), total & blighted tuber yield (t/ha) at maturity.

Treatments	Late blight Incidence (%) at weekly interval after appearance													
	Actual values							Arc sine transformed values						
	7	14	21	28	35	42	49	7	14	21	28	35	42	49
T1	15.69	20.25	25.65	29.80	33.11	38.41	40.61	23.27	26.72	30.39	33.06	35.10	38.28	39.57
T2	9.75	14.14	19.78	23.73	25.65	28.04	30.44	18.16	22.06	26.38	29.14	30.41	31.96	33.47
T3	12.62	16.35	19.78	24.25	28.45	31.99	33.34	20.75	23.82	26.38	29.46	32.22	34.42	35.25
T4	19.42	25.27	36.59	43.40	52.31	62.11	72.19	26.11	30.16	37.20	41.19	46.31	52.00	58.16
SEd	1.37	0.95	1.16	1.54	1.07	1.36	1.18	1.12	0.71	0.75	0.97	0.63	0.82	0.73
CD(5%)	3.02	2.09	2.56	3.40	2.36	3.00	2.60	2.46	1.56	1.66	2.14	1.39	1.81	1.62
CV %	15.10	7.90	7.21	8.05	4.85	5.36	4.23	7.99	4.37	3.96	4.63	2.77	3.32	2.79

Table contd.....

Treatments	Late blight intensity (%) at weekly interval after appearance													
	Actual values							Arc sine transformed values						
	7	14	21	28	35	42	49	7	14	21	28	35	42	49
T1	9.15	12.24	15.00	17.24	18.44	19.36	20.38	17.59	20.44	22.76	24.48	25.40	26.08	26.82
T2	7.46	10.00	12.84	13.40	14.31	15.87	17.59	15.80	18.42	20.96	21.44	22.19	23.45	24.78
T3	8.53	11.36	13.26	14.77	15.53	16.98	18.46	16.96	19.67	21.34	22.57	23.20	24.30	25.43
T4	10.28	16.55	21.02	27.02	34.79	39.71	42.55	18.69	23.98	27.26	31.30	36.12	39.04	40.70
SEd	0.52	0.77	0.98	0.95	1.08	1.10	0.72	0.54	0.66	0.76	0.71	0.81	0.76	0.48
CD(5%)	1.15	1.70	2.16	2.08	2.38	2.42	1.58	1.18	1.45	1.68	1.57	1.78	1.68	1.06
CV %	9.36	9.75	9.99	8.25	8.21	7.56	4.59	4.91	5.06	5.22	4.51	4.78	4.28	2.58

Table contd.....

Treatment	Incidence (%) at harvest		Tuber yield (t/ha)		Number of tubers (no/ha)	
	Actual	Arc sine	Total	Blighted	Total	Blighted
T1	8.47	16.77	12.81	1.01	180333	14667
T2	4.98	12.81	17.96	0.81	251000	12333
T3	7.22	15.49	14.84	0.92	209000	14667
T4	15.70	23.15	9.32	1.28	128667	20333
SEd	2.15	1.88	1.36	0.08	20044	1934
CD(0.05)	4.73	4.14	2.99	0.18	44157	4261
CV %	37.32	17.42	15.63	12.86	16.49	19.73

## KALYANI

Minimum intensity (7.80%) of blight was recorded in the treatment where prophylactic spray of mancozeb followed by fenamidone+mancozeb and one more spray of mancozeb (T3) was given followed by T2 (prophylactic spray of chlorothalonil followed by cymoxanil+mancozeb and one more spray of chlorothalonil) compared to control (18.02%) on first date of observation i.e. 7 days after first appearance, which increased to 9.35% and 11.30% compared to control (49.15%) on third date of observation, respectively. On last date of observation i.e. 28 days after appearance, minimum intensity of late blight (11.49%) was recorded in the treatment where prophylactic spray of mancozeb followed by fenamidone+mancozeb and one more spray of mancozeb (T3) was given. The next best treatment was prophylactic spray of chlorothalonil followed by cymoxanil+mancozeb and chlorothalonil spray (T2) and these two treatments are statistically on par with each other. Maximum yield (29.17 t/ha) was recorded in T3 followed by T2 treatment.

**Table 884:** Late blight incidence (%) at 7 days interval (after appearance) and total tuber yield (t/ha) at maturity.

Treatments	Percent incidence of late blight at 7 days					Percent incidence of late blight at 14 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	11.35	9.24	8.42	23.53	13.14	13.82	10.66	9.52	39.63	18.41
V2	13.48	10.18	9.40	26.57	14.91	14.78	11.84	10.55	42.45	19.91
Means	12.42	9.71	8.91	25.05		14.30	11.25	10.04	41.04	
SE (V)	0.36					0.36				



SE (T)	0.50					0.51				
SE (VT)	0.71					0.73				
CD (V)	0.73					0.75				
CD (T)	1.03					1.06				
CD (VT)	NS					NS				
Treatments	Percent incidence of late blight at 21 days					Percent incidence of late blight at 28 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	15.28	12.30	10.69	63.76	25.51	17.56	13.86	12.45	78.42	30.57
V2	16.26	13.40	11.75	66.32	26.93	18.63	14.78	13.20	79.36	31.49
Means	15.77	12.85	11.22	65.04		18.10	14.32	12.83	78.89	
SE (V)	0.39					0.38				
SE (T)	0.55					0.54				
SE (VT)	0.78					0.76				
CD (V)	0.81					0.78				
CD (T)	1.14					1.10				
CD (VT)	NS					NS				
Treatments	Percent intensity of late blight at 7 days					Percent intensity of late blight at 14 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	9.50	8.67	7.35	16.45	10.49	11.46	9.17	8.25	29.64	14.63
V2	11.28	8.92	8.25	19.60	12.01	13.36	9.15	8.80	32.55	15.97
Means	10.39	8.80	7.80	18.02		12.41	9.16	8.53	31.10	
SE (V)	0.31					0.30				
SE (T)	0.44					0.42				
SE (VT)	0.62					0.59				
CD (V)	0.64					0.61				
CD (T)	0.91					0.86				
CD (VT)	1.29					1.22				
Treatments	Percent intensity of late blight at 21 days					Percent intensity of late blight at 28 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	13.39	11.24	9.30	48.56	20.62	15.25	12.40	11.18	59.35	24.55
V2	15.10	11.36	9.40	49.74	21.40	16.40	12.36	11.79	61.26	25.45
Means	14.25	11.30	9.35	49.15		15.83	12.38	11.49	60.31	
SE (V)	0.34					0.26				
SE (T)	0.48					0.37				
SE (VT)	0.68					0.52				
CD (V)	0.70					0.54				
CD (T)	1.00					0.76				
CD (VT)	NS					NS				
Treatments	Total Yield (t/a)					Total no of tubers (no/ha)				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	25.39	27.37	30.42	18.84	25.51	208000	224333	255000	161333	212167
V2	23.67	26.17	27.92	17.84	23.90	203000	213667	233667	142000	198083
Means	24.53	26.77	29.17	18.34		205500	219000	244333	151667	
SE (V)	0.39					4060				
SE (T)	0.55					5741				
SE (VT)	0.78					8119				
CD (V)	0.80					8359				
CD (T)	1.13					11821				
CD (VT)	NS					NS				

## PATNA

Blight did not appear.

**Table 885:** Total tuber yield (t/ha)

Treatments	Total Yield (t/a)				
	T1	T2	T3	T4	Means
V1	22.53	24.82	23.40	23.59	23.59
V2	26.58	27.64	28.30	28.58	27.77

Means	24.55	26.23	25.85	26.08
SE (V)	1.43			
SE (T)	2.03			
SE (VT)	2.86			
CD (V)	2.95			
CD (T)	NS			
CD (VT)	NS			

## PANTNAGAR

Late blight intensity in traces was recorded on first date of observation. On second date of observation, minimum intensity (1.50%) of blight was recorded in the treatment where prophylactic spray of chlorothalonil followed by dimethomorph+mancozeb and one more spray of chlorothalonil (T2) was given followed by T3 (prophylactic spray of mancozeb followed by dimethomorph+mancozeb and one more spray of mancozeb) compared to control (6.50%) which increased to 3.50% and 4.50% compared to control (18%) on third date of observation, respectively. On last date of observation i.e. 49 days after appearance, minimum intensity of late blight (31%) was recorded in the treatment where prophylactic spray of chlorothalonil followed by dimethomorph+mancozeb and one more spray of chlorothalonil (T2) was given. The next best treatment was prophylactic spray of mancozeb followed by dimethomorph+mancozeb and mancozeb spray (T3) and these two treatments are statistically on par with each other. Maximum yield (40.04 t/ha) was recorded in T2 followed by T3 treatment.

**Table 886:** Late blight incidence (%) & intensity at 7 days interval (after appearance) and total tuber yield (t/ha) at maturity.

Treatments	Actual values									
	Percent incidence of late blight at 7 days					Percent incidence of late blight at 14 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	8.00	2.00	3.00	24.00	9.25	26.00	6.00	30.00	54.00	29.00
V2	0.00	0.00	0.00	2.00	0.50	8.00	4.00	0.00	16.00	7.00
Means	4.00	1.00	1.50	13.00		17.00	5.00	15.00	35.00	
SE (V)	1.68					5.06				
SE (T)	2.37					7.15				
SE (VT)	3.35					10.12				
CD (V)	3.45					10.42				
CD (T)	4.88					14.73				
CD (VT)	6.91					NS				
Treatments	Percent incidence of late blight at 21 days					Percent incidence of late blight at 28 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	44.00	24.00	50.00	76.00	48.50	84.00	78.00	86.00	100.00	87.00
V2	16.00	8.00	20.00	64.00	27.00	60.00	64.00	72.00	92.00	72.00
Means	30.00	16.00	35.00	70.00		72.00	71.00	79.00	96.00	
SE (V)	6.76					5.26				
SE (T)	9.56					7.43				
SE (VT)	13.52					10.51				
CD (V)	13.92					10.82				
CD (T)	19.68					15.30				
CD (VT)	NS					NS				
Treatments	Percent incidence of late blight at 35 days					Percent incidence of late blight at 42 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
V2	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Means	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SE (V)	0.00					0.00				
SE (T)	0.00					0.00				
SE (VT)	0.00					0.00				
CD (V)	0.00					0.00				
CD (T)	0.00					0.00				
CD (VT)	0.00					0.00				

Treatments	Percent incidence of late blight at 49 days					Percent intensity of late blight at 7 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	100.00	100.00	100.00	100.00	100.00	2.00	1.00	1.00	5.00	2.25
V2	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	1.00	0.25
Means	100.00	100.00	100.00	100.00	100.00	1.00	0.50	0.50	3.00	
SE (V)	0.00					0.53				
SE (T)	0.00					0.74				
SE (VT)	0.00					1.05				
CD (V)	0.00					1.08				
CD (T)	0.00					1.53				
CD (VT)	0.00					NS				
Treatments	Percent intensity of late blight at 14 days					Percent intensity of late blight at 21 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	4.00	1.00	4.00	9.00	4.50	9.00	5.00	6.00	24.00	11.00
V2	1.00	2.00	0.00	4.00	1.75	3.00	2.00	3.00	12.00	5.00
Means	2.50	1.50	2.00	6.50		6.00	3.50	4.50	18.00	
SE (V)	0.73					1.01				
SE (T)	1.04					1.42				
SE (VT)	1.46					2.01				
CD (V)	1.51					2.07				
CD (T)	2.13					2.93				
CD (VT)	3.01					4.15				
Treatments	Percent intensity of late blight at 28 days					Percent intensity of late blight at 35 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	20.00	10.00	9.00	56.00	23.75	26.00	20.00	16.00	78.00	35.00
V2	9.00	8.00	8.00	48.00	18.25	18.00	8.00	12.00	72.00	27.50
Means	14.50	9.00	8.50	52.00		22.00	14.00	14.00	75.00	
SE (V)	1.25					1.76				
SE (T)	1.76					2.50				
SE (VT)	2.49					3.53				
CD (V)	2.56					3.63				
CD (T)	3.62					5.14				
CD (VT)	5.13					NS				
Treatments	Percent intensity of late blight at 42 days					Percent intensity of late blight at 49 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	36.00	24.00	24.00	100.00	46.00	46.00	34.00	34.00	100.00	53.50
V2	28.00	18.00	22.00	88.00	39.00	38.00	28.00	32.00	98.00	49.00
Means	32.00	21.00	23.00	94.00		42.00	31.00	33.00	99.00	
SE (V)	1.38					1.38				
SE (T)	1.95					1.95				
SE (VT)	2.75					2.75				
CD (V)	2.83					2.83				
CD (T)	4.01					4.01				
CD (VT)	NS					NS				
Arc sine transformed values										
Treatments	Percent incidence of late blight at 7 days					Percent incidence of late blight at 14 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	10.63	3.69	4.56	29.24	12.03	27.01	6.65	29.79	47.51	27.74
V2	0.00	0.00	0.00	3.69	0.92	7.85	7.38	0.00	18.48	8.43
Means	5.32	1.84	2.28	16.46		17.43	7.01	14.90	32.99	
SE (V)	2.37					4.37				
SE (T)	3.35					6.18				
SE (VT)	4.74					8.74				
CD (V)	4.88					9.00				
CD (T)	6.90					12.73				
CD (VT)	9.76					NS				
Treatments	Percent incidence of late blight at 21 days					Percent incidence of late blight at 28 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	41.33	26.11	45.20	64.19	44.21	71.57	65.57	73.19	90.05	75.09
V2	15.47	10.63	18.01	56.56	25.17	51.25	56.56	61.41	79.42	62.16

Means	28.40	18.37	31.60	60.37		61.41	61.07	67.30	84.73	
SE (V)	5.50					4.55				
SE (T)	7.78					6.44				
SE (VT)	11.01					9.11				
CD (V)	11.33					9.38				
CD (T)	16.02					13.26				
CD (VT)	NS					NS				
Treatments	Percent incidence of late blight at 35 days					Percent incidence of late blight at 42 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	90.05	90.05	90.05	90.05	90.05	90.05	90.05	90.05	90.05	90.05
V2	90.05	90.05	90.05	90.05	90.05	90.05	90.05	90.05	90.05	90.05
Means	90.05	90.05	90.05	90.05	90.05	90.05	90.05	90.05	90.05	90.05
SE (V)	0.00					0.00				
SE (T)	0.00					0.00				
SE (VT)	0.00					0.00				
CD (V)	0.00					0.00				
CD (T)	0.00					0.00				
CD (VT)	0.00					0.00				
Treatments	Percent incidence of late blight at 49 days					Percent intensity of late blight at 7 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	90.05	90.05	90.05	90.05	90.05	5.17	2.59	2.59	12.93	5.82
V2	90.05	90.05	90.05	90.05	90.05	0.00	0.00	0.00	2.59	0.65
Means	90.05	90.05	90.05	90.05	90.05	2.59	1.29	1.29	7.76	
SE (V)	0.00					1.36				
SE (T)	0.00					1.92				
SE (VT)	0.00					2.72				
CD (V)	0.00					2.80				
CD (T)	0.00					3.96				
CD (VT)	0.00					NS				
Treatments	Percent intensity of late blight at 14 days					Percent intensity of late blight at 21 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	10.34	2.59	10.34	17.34	10.15	17.34	11.45	14.03	29.24	18.01
V2	2.59	5.17	0.00	8.86	4.16	6.27	5.17	6.27	20.07	9.45
Means	6.47	3.88	5.17	13.10		11.81	8.31	10.15	24.65	
SE (V)	1.63					1.45				
SE (T)	2.30					2.05				
SE (VT)	3.26					2.90				
CD (V)	3.35					2.99				
CD (T)	4.74					4.22				
CD (VT)	6.70					NS				
Treatments	Percent intensity of late blight at 28 days					Percent intensity of late blight at 35 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	26.58	18.44	17.34	48.53	27.72	30.57	26.58	23.32	62.44	35.73
V2	17.34	16.24	16.24	43.87	23.42	24.95	16.24	20.07	58.27	29.88
Means	21.96	17.34	16.79	46.20		27.76	21.41	21.70	60.36	
SE (V)	0.88					1.29				
SE (T)	1.24					1.83				
SE (VT)	1.76					2.59				
CD (V)	1.81					2.66				
CD (T)	2.56					3.77				
CD (VT)	3.62					NS				
Treatments	Percent intensity of late blight at 42 days					Percent intensity of late blight at 49 days				
	T1	T2	T3	T4	Means	T1	T2	T3	T4	Means
V1	36.84	29.24	29.24	90.05	46.34	42.71	35.64	35.64	90.05	51.01
V2	31.90	24.95	27.91	69.97	38.68	38.05	31.90	34.43	86.36	47.69
Means	34.37	27.10	28.58	80.01		40.38	33.77	35.04	88.21	
SE (V)	0.96					1.25				
SE (T)	1.36					1.77				
SE (VT)	1.92					2.51				
CD (V)	1.98					2.58				

CD (T)	2.79					3.65
CD (VT)	3.95					NS
Treatments	Total yield (t/ha)					
	T1	T2	T3	T4	Means	
V1	30.61	33.34	33.27	22.64	29.96	
V2	38.77	46.74	42.91	27.84	39.07	
Means	34.69	40.04	38.09	25.24		
SE (V)	1.07					
SE (T)	1.51					
SE (VT)	2.14					
CD (V)	2.20					
CD (T)	3.12					
CD (VT)	NS					

## SRINAGAR

Minimum intensity (7.6 & 8.7%) of blight was recorded in the treatment where prophylactic spray of chlorothalonil followed by dimethomorph+mancozeb and one more spray of chlorothalonil (T2) compared to control (12.8 & 13.6%) on first date of observation, which increased to 8.5 & 10.5% compared to control (16.6 & 18.9%) on second date of observation. On last date of observation i.e. 28 days after appearance, minimum intensity of late blight (16.4 & 18.7%) was recorded in the treatment where prophylactic spray of chlorothalonil followed by dimethomorph+mancozeb and one more spray of chlorothalonil (T2) was given as against of 31.6 & 30.3% in control. Maximum yield (34.36 & 31.64 t/ha) was also recorded in T2 treatment.

**Table 887:** Late blight incidence at 7 days interval after appearance and total tuber yield (t/ha)

Treatments	Date of first appearance of late blight	% Incidence (days after disease appearance)				Total yield (t/ha)
		7 Days	14 Days	21 Days	28 Days	
V1T1	19.06.16	9.8	12.5	18.7	22.7	32.75
V1T2	21.06.16	7.6	8.5	12.7	16.4	34.36
V1T3	18.06.16	11.2	14.8	20.9	25.5	31.48
V1T4	16.06.16	12.8	16.6	24.4	31.6	27.15
V2T1	10.06.16	11.4	15.5	20.4	23.7	30.45
V2T2	14.06.16	8.7	10.5	13.6	18.7	31.64
V2T3	09.06.16	11.5	16.7	24.8	27.7	28.56
V2T4	03.06.16	13.6	18.9	26.2	30.3	28.20

#### PATH. 4: STUDIES ON RATE OF DEGENERATION

Productivity, production and quality of vegetative propagated crops like potato are challenged by various biotic and abiotic factors. Among the biotic factors, pathogens especially viruses play a crucial role especially in seed potato production. As the crop is vegetatively propagated, it carries viruses, which multiplies over the generations and leads to degeneration of potato seed. Hence, the studies on seed degeneration were carried out to know how frequently the seed needs to be replaced for better yield and quality parameters. The studies were undertaken in four locations i.e., in Deesa, Hassan, Kalyani and Raipur. Observations on plant emergence at 30 and 40 day of planting, incidences of mild mosaic, severe mosaic and PLRV were recorded at different intervals, population of vectors like aphids, whiteflies and thrips, incidence of late blight & common scab were recorded. Yield data was also recorded on harvest. In general, the incidences of mild mosaic, severe mosaic as well as PLRV were lower in crops raised from fresh breeder seed. In Raipur, no incidence of any of the viral disease in crops raised from fresh breeder seed was recorded.

**Table 888:** Experimental details

Centre	DES	HSN	KAL	RPR
Year	2016-17	2016-17	2016-17	2016-17
Spacing (cm)	50X20	60x20	60x20	60x20
Gross plot size (m <sup>2</sup> )	6.00	432.00	18.00	6.00
Date of Planting	17.11.16	11.07.16	13.11.16	14.11.16
Date of Dehaulming	26.02.17	02.10.16	23.01.17	13.02.17
Date of Harvesting	27.02.17	17.02.17	04.02.17	21.02.17
Variety	V1 K Badshah	K Jyoti	K Khyati	K Surya
	V2 K Khyati	K Khyati	K Jyoti	K Khyati

#### Treatments

- T1 : Fresh breeder seed every year  
 T2 : Previous seed produce using seed plot techniques  
 T3 : Previous seed produce without seed plot techniques

#### DEESA

The data on per cent plant emergence was presented where Kufri Badshah and Kufri Khyati recorded 91.42 and 88.11 percent germination respectively after 40 days of planting. With respect to yield Kufri Khyati and Kufri Badshah yielded 37.97 and 42.79 t/ha respectively. Since, there was no record of viral disease incidence in both the varieties; the studies of degeneration cannot be interpreted.

**Table 889:** Per cent plant emergence at 30 & 40 DAP, grade-wise tuber yield (t/ha) and incidence (%) of common scab

Treatments	Plant emergence (%) at 30 DAP				Plant emergence (%) at 40 DAP			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	86.86	85.00	85.00	85.62	95.33	90.00	88.93	91.42
V2	83.33	82.66	81.66	82.55	90.66	87.33	86.33	88.11
Means	85.10	83.83	83.33		93.00	88.66	87.63	
SE (V)	1.25				1.71			
SE (T)	1.53				2.09			
SE (VT)	2.16				2.96			
CD (V)	2.62				NS			
CD (T)	NS				4.39			
CD (VT)	NS				NS			
Treatments	Yield of tubers 0-25g (t/ha)				Yield of tubers 25-50g (t/ha)			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	1.10	1.65	1.69	1.48	9.44	9.05	7.08	8.52
V2	1.98	1.60	1.28	1.62	12.90	10.72	7.10	10.24
Means	1.54	1.62	1.49		11.17	9.88	7.09	
SE (V)	0.10				0.59			

SE (T)	0.13				0.72			
SE (VT)	0.18				1.01			
CD (V)	NS				1.23			
CD (T)	NS				1.51			
CD (VT)	0.37				NS			
Treatments	Yield of tubers 50-75g (t/ha)				Yield of tubers >75g (t/ha)			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	14.20	11.83	9.64	11.89	17.71	16.13	14.42	16.09
V2	13.85	12.86	9.20	11.97	21.59	17.92	17.38	18.96
Means	14.03	12.35	9.42		19.65	17.02	15.90	
SE (V)	0.73				0.99			
SE (T)	0.89				1.21			
SE (VT)	1.26				1.71			
CD (V)	NS				2.07			
CD (T)	1.87				2.54			
CD (VT)	NS				NS			
Treatments	Total yield (t/ha)				Incidence (%) of common scab (Russet type)			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	42.45	38.65	32.82	37.97	10.17	22.21	32.81	21.73
V2	50.32	43.09	34.96	42.79	14.41	15.39	23.16	17.66
Means	46.39	40.87	33.89		12.29	18.80	27.99	
SE (V)	1.18				1.52			
SE (T)	1.45				1.86			
SE (VT)	2.05				2.64			
CD (V)	2.48				3.20			
CD (T)	3.04				3.92			
CD (VT)	NS				5.54			

## HASSAN

Germination percentage in Kufri Jyoti and Kufri Khyati was recorded 86.0 and 82%, respectively after 40 days of planting. With respect to yield 13.50 t/ha was recorded in Kufri Jyoti and 12.12 t/ha in Kufri Khyati. With respect to viral disease incidence; 32, 21 and 19 per cent incidence of mild mosaic, severe mosaic and PLRV, respectively were recorded at 75 days of planting in Kufri Jyoti. Whereas, 26, 14 and 14 per cent incidence of mild mosaic, severe mosaic and PLRV, respectively were recorded at 75 days of planting in Kufri Khyati. The vector incidence was also recorded where 18, 118 and 107 incidence of whiteflies, aphids and thrips, respectively were recorded in Kufri Jyoti and 12, 105 and 89 incidence of whiteflies, aphids and thrips, respectively in Kufri Khyati. Since, the data on per cent incidence of viral disease was not recorded in previous seed produce using seed plot techniques and without seed plot technique; the studies of degeneration cannot be interpreted.

**Table 890:** Per cent plant emergence at 30 & 40 DAP and grade-wise yield (t/ha)

Treatment	Emergence (%) at		Grade-wise yield (t/ha)				Total
	30 DAP	40 DAP	0-25g	25-50g	50-75g	>75g	
V1	84	86	1.24	4.12	4.86	3.28	13.5
V2	79	82	1.14	3.79	3.47	3.72	12.12

**Table 891:** (%) Incidence of viral disease at days after planting (average) & vector incidence

Treatment	Mild Mosaic			Severe Mosaic			PLRV			Vector incidence		
	45	60	75	45	60	75	45	60	75	Whiteflies	Aphids	Thrips population
V1	18	26	32	8	14	21	6	11	19	18	118	107
V2	12	20	26	5	9	14	3	8	14	12	105	89

## KALYANI

The per cent plant emergence was 98.58 and 95.22 in Kufri Khyati and Kufri Jyoti, respectively after 40 days of planting. With respect to viral disease incidence, the fresh breeder's seed of both the varieties *i.e.*, Kufri Khyati

and Kufri Jyoti remained free of mild mosaic, severe mosaic and PLRV. In seed produced using seed plot techniques, there was no incidence of mild mosaic in both the varieties whereas, 2.0 % and 6.85% incidence of severe mosaic and PLRV, respectively was recorded in Kufri Khyati whereas, in Kufri Jyoti 1 and 5.35% severe mosaic and PLRV was recorded at 60 days of planting. With respect to previous seed produce without seed plot technique, an incidence of mild mosaic (1.99%), severe mosaic (2.76%) and PLRV (9.3%) was recorded in Kufri Khyati whereas, in Kufri Jyoti, 1.27% mild mosaic, 1.92% severe mosaic and 9.68% PLRV was recorded at 60 days of planting. Hence, in general the data reveals that there was no incidence of any viral disease in fresh breeder's seed of both the varieties. But the severe mosaic and PLRV was recorded with low incidence in seed produced using seed plot technique in comparison with seed produced using without seed plot techniques where all the three viral diseases were recorded. The same trend was observed in both the varieties. At the same time there was proportionate reduction in yield i.e., 22.37, 19.14 and 12.81 t/ha in fresh breeder's seed, seed produced using seed plot technique and without seed plot technique, respectively.

**Table 892:** Per cent plant emergence at 30 & 40 DAP, grade-wise yield (t/ha) and incidence (%) of viral disease at days after planting (average) & vector incidence

Treatments	Plant emergence at 30 DAP (%)				Plant emergence at 40 DAP (%)			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	99.25	97.00	92.37	96.21	99.87	99.37	96.50	98.58
V2	96.61	73.52	86.62	85.59	98.92	94.77	91.95	95.22
Means	97.93	85.26	89.50		99.40	97.07	94.22	
SE (V)	5.44				1.22			
SE (T)	6.67				1.49			
SE (VT)	9.43				2.11			
CD (V)	NS				2.56			
CD (T)	NS				3.13			
CD (VT)	NS				NS			
Treatments	Yield of tubers 0-25g (t/ha)				Yield of tubers 25-50g (t/ha)			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	0.61	0.59	0.46	0.55	4.09	2.93	2.11	3.05
V2	1.65	1.36	1.27	1.43	4.72	4.09	2.78	3.86
Means	1.13	0.97	0.86		4.41	3.51	2.45	
SE (V)	0.13				0.29			
SE (T)	0.16				0.36			
SE (VT)	0.23				0.51			
CD (V)	0.28				0.61			
CD (T)	NS				0.75			
CD (VT)	NS				NS			
Treatments	Yield of tubers 50-75g (t/ha)				Yield of tubers >75g (t/ha)			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	6.46	5.89	5.87	6.08	12.79	10.77	6.62	10.06
V2	6.71	5.76	3.03	5.17	7.73	6.90	3.48	6.04
Means	6.58	5.83	4.45		10.26	8.83	5.05	
SE (V)	0.30				0.43			
SE (T)	0.36				0.53			
SE (VT)	0.52				0.75			
CD (V)	0.63				0.90			
CD (T)	0.77				1.11			
CD (VT)	1.08				NS			
Treatments	Total yield (t/ha)				Mild Mosaic at 45 days			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	23.95	20.18	15.06	19.73	0.00	0.00	0.82	0.27
V2	20.79	18.10	10.57	16.49	0.00	0.00	1.77	0.59
Means	22.37	19.14	12.81		0.00	0.00	1.30	
SE (V)	0.58				0.13			
SE (T)	0.72				0.16			
SE (VT)	1.01				0.23			
CD (V)	1.23				0.28			
CD (T)	1.50				0.34			



CD (VT)	NS				0.48			
Treatments	Mild Mosaic at 60 days				Severe Mosaic at 45 days			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	0.00	0.00	1.99	0.66	0.00	0.61	0.78	0.47
V2	0.00	0.00	1.27	0.42	0.00	0.00	0.42	0.14
Means	0.00	0.00	1.63		0.00	0.31	0.60	
SE (V)	0.15				0.12			
SE (T)	0.18				0.14			
SE (VT)	0.26				0.20			
CD (V)	NS				0.25			
CD (T)	0.38				0.30			
CD (VT)	NS				NS			
Treatments	Severe Mosaic at 60 days				PLRV at 45 days			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	0.00	2.00	2.76	1.59	0.00	0.00	3.78	1.26
V2	0.00	1.00	1.92	0.97	0.00	0.00	3.38	1.13
Means	0.00	1.50	2.34		0.00	0.00	3.58	
SE (V)	0.41				0.34			
SE (T)	0.50				0.42			
SE (VT)	0.70				0.59			
CD (V)	NS				NS			
CD (T)	1.05				0.87			
CD (VT)	NS				NS			
Treatments	PLRV at 60 days				Incidence of common scab (Russet type) (%)			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	0.00	6.85	9.30	5.38	0.70	0.82	1.16	0.89
V2	0.00	5.35	9.68	5.01	0.85	1.04	1.66	1.18
Means	0.00	6.10	9.49		0.78	0.93	1.41	
SE (V)	0.50				0.23			
SE (T)	0.62				0.29			
SE (VT)	0.87				0.40			
CD (V)	NS				NS			
CD (T)	1.30				NS			
CD (VT)	NS				NS			

## RAIPUR

The plant emergence was 94.0 % each in Kufri Surya and Kufri Khyati after 40 days of planting. The incidence of viral disease in fresh breeder's seed of Kufri Surya was 2.3 %, 1.9% and 0.53% of mild mosaic, severe mosaic and PLRV, respectively whereas, in Kufri Khyati 2.22, 1.71 and 0.83% incidence of mild mosaic, severe mosaic and PLRV was recorded at 75 days of planting. In seed produced using seed plot techniques, Kufri Surya recorded 5.3 %, 5.07% and 1.0% incidence of mild mosaic, severe mosaic and PLRV, respectively whereas, in Kufri Khyati 3.77, 4.18 and 1.35% incidence of mild mosaic, severe mosaic and PLRV was recorded at 75 days of planting. With respect to previous seed produced without seed plot technique, an incidence of 14.61% mild mosaic, 9.98% severe mosaic and 1.54% PLRV was recorded in K. Surya whereas, in Kufri Khyari, 11.90% mild mosaic, 8.51% severe mosaic and 2.20% PLRV was recorded at 75 days of planting. The data reveals that there was an incidence of the viral disease even in fresh breeder's seed but it was considerably low in comparison to seed produced using seed plot technique. The incidence was very high in seed produced without seed plot techniques in comparison with fresh breeder's seed. The trend was same in both the varieties. The incidence of the viral diseases might be due to high vector pressure (aphids, thrips and whiteflies) which is almost uniform throughout the treatments and varieties. Similarly, as expected and based on the virus and vector pressure, the reduction in yield was also proportionate i.e., 26.49, 21.04 and 16.83 t/ha in fresh breeder's seed, seed produced using seed plot technique and without seed plot technique, respectively.

**Table 893:** Per cent plant emergence at 30 & 40 DAP, grade-wise yield (t/ha) and incidence (%) of viral disease at days after planting (average) & vector incidence

Treatments	Plant emergence at 30 DAP (%)				Plant emergence at 40 DAP (%)			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	94.00	92.67	78.67	88.44	98.00	96.67	87.33	94.00
V2	96.00	94.00	86.00	92.00	96.00	93.33	92.67	94.00
Means	95.00	93.33	82.33		97.00	95.00	90.00	
SE (V)	1.96				2.49			
SE (T)	2.40				3.05			
SE (VT)	3.40				4.31			
CD (V)	NS				NS			
CD (T)	5.42				NS			
CD (VT)	NS				NS			
Treatments	Yield of tubers 0-25g (t/ha)				Yield of tubers 25-50g (t/ha)			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	8.06	6.47	4.61	6.38	4.64	5.27	4.13	4.68
V2	11.56	8.00	4.06	7.87	5.72	4.48	4.99	5.07
Means	9.81	7.23	4.33		5.18	4.88	4.56	
SE (V)	0.34				0.67			
SE (T)	0.41				0.82			
SE (VT)	0.59				1.17			
CD (V)	0.76				NS			
CD (T)	0.93				NS			
CD (VT)	1.32				NS			
Treatments	Yield of tubers 50-75g (t/ha)				Yield of tubers >75g (t/ha)			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	6.72	4.39	4.45	5.19	4.61	3.17	1.61	3.13
V2	5.28	4.61	2.81	4.23	4.11	3.64	4.44	4.06
Means	6.00	4.50	3.63		4.36	3.40	3.03	
SE (V)	0.14				0.44			
SE (T)	0.18				0.54			
SE (VT)	0.25				0.76			
CD (V)	0.33				NS			
CD (T)	0.40				NS			
CD (VT)	0.56				1.72			
Treatments	Total yield (t/ha)				Mild Mosaic at 75 days			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	24.81	20.24	16.52	20.52	2.30	5.03	14.61	7.31
V2	28.17	21.85	17.13	22.38	2.22	3.77	11.90	5.96
Means	26.49	21.04	16.83		2.26	4.40	13.26	
SE (V)	1.22				0.12			
SE (T)	1.50				0.15			
SE (VT)	2.12				0.21			
CD (V)	NS				0.28			
CD (T)	3.38				0.34			
CD (VT)	NS				0.48			
Treatments	Severe Mosaic at 75 days				PLRV at 75 days			
	T1	T2	T3	Means	T1	T2	T3	Means
V1	1.98	5.07	9.98	5.68	0.53	1.00	1.54	1.02
V2	1.71	4.18	8.51	4.80	0.83	1.35	2.20	1.46
Means	1.84	4.62	9.24		0.68	1.17	1.87	
SE (V)	0.09				0.04			
SE (T)	0.11				0.05			
SE (VT)	0.16				0.06			
CD (V)	0.21				0.08			
CD (T)	0.25				0.10			
CD (VT)	0.36				0.15			
Treatments	Incidence of Whiteflies				Incidence of Aphids			
	T1	T2	T3	Means	T1	T2	T3	Means

V1	24.31	25.35	23.94	24.53	18.37	18.39	19.37	18.71
V2	22.08	22.08	22.05	22.07	15.36	14.44	15.87	15.22
Means	23.19	23.71	23.00		16.87	16.42	17.62	
SE (V)	0.24				0.10			
SE (T)	0.30				0.12			
SE (VT)	0.42				0.17			
CD (V)	0.55				0.22			
CD (T)	NS				0.27			
CD (VT)	NS				0.38			
Treatments	Incidence of thrips population							
	T1	T2	T3	Means				
V1	29.33	34.67	34.67	32.89				
V2	36.67	31.00	33.00	33.56				
Means	33.00	32.83	33.83					
SE (V)	1.13							
SE (T)	1.39							
SE (VT)	1.96							
CD (V)	NS							
CD (T)	NS							
CD (VT)	4.43							

## PATH 5: MANAGEMENT OF EARLY BLIGHT

The experiment conducted at Bhubaneswar and Deesa.

**Table 894:** Experimental and treatment details

Centre	BHN	DES
Year	2016-17	2016-17
Replication	RBD	RBD
Spacing	60 X 20	50 X 20
Plot size (m <sup>2</sup> )	7.20	6.00
Variety	K Ashoka	K Pukhraj
Date of Planting	28.11.16	17.11.16
Date of Harvesting	11.02.17	27.02.17

### Treatments

- T1 : Control  
 T2 : Spray of urea (1%) + mancozeb @0.25% at 40-45 days crop age and repeat at 8-10 days interval  
 T3 : Spray of urea (1%) + mancozeb @0.25% at 40-45 days crop age and repeat at 8-10 days interval followed by one more spray of mancozeb  
 T4 : First spray of mancozeb 75WP (0.25%), second spray of hexaconazole 5EC (0.05%) and third spray of mancozeb 75WP (0.25%) at 10 days interval  
 \* Start spraying with first appearance of disease

### BHUBANESHWAR

At Bhubaneswar, all treatments reduced per cent disease severity of early blight significantly compared to control. The minimum terminal severity (4.44%) was recorded in T4 followed by T3 (9.60%) and T2 (10.48%). Also, all treatments resulted in significantly higher tuber yields (20.22 to 23.29t/ha) compared to control (18.86 t/ha) with highest tuber yield recorded in T3 (23.29t/ha).

**Table 895:** Incidence (%) of early blight and total tuber yield (t/ha)

Treatment	Diseases severity of early blight (days after first appearance) at				Total tuber yield (t/ha)
	10 days	20 days	30 days	40 days	
T1	2.52	4.79	10.43	19.99	18.86
T2	2.07	3.12	5.15	10.48	20.22
T3	1.99	2.85	4.85	9.60	23.29
T4	1.67	2.41	3.59	4.44	22.69
SEd	0.07	0.16	0.19	0.55	1.52
CD (0.05)	0.16	0.37	0.44	1.27	NS
CV%	4.85	7.01	4.52	7.01	10.11

### DEESA

At Deesa, all treatments reduced per cent disease severity of early blight significantly compared to control. The minimum terminal severity (5.28%) was recorded in T4 followed by T3 (8.06%) and T2 (10.00%). Also, all treatments resulted in significantly higher tuber yields (53.14 to 56.96 t/ha) compared to control (43.49 t/ha) with highest tuber yield recorded in T4 (56.96 t/ha).

**Table 896:** Incidence (%) of early blight and total tuber yield (t/ha)

Treatment	Diseases severity of early blight (days after first appearance) at				Total tuber yield (t/ha)
	10 days	20 days	30 days	40 days	
T1	5.84	8.61	10.28	13.05	43.49
T2	3.05	5.56	7.50	10.00	53.14
T3	3.61	4.17	5.84	8.06	54.18
T4	2.50	3.33	4.72	5.28	56.96
SEd	0.54	0.68	0.82	1.11	3.50
CD (0.05)	1.24	1.56	1.88	2.55	8.04
CV%	20.37	17.78	16.34	17.30	9.54

## PATH.6: MANAGEMENT OF COMMON SCAB

The experiment was conducted with 7 treatments in RBD with 4 replications at Faizabad, Kanpur and Patna.

At Faizabad, all treatments significantly reduced common scab (CS) incidence and severity from that of T1 (Control). Highest incidence and severity of CS (60.0 and 35.7%, respectively) was recorded in plots where untreated diseased tubers were used (T-1). Minimum incidence (16.7 and 18.3%) and severity (12.8 and 14.5%) was observed in T-2 (tuber dip treatment with 3% boric acid for 20 minutes before storage) and T-5 (where tubers dipped for 20 minutes in 3% boric acid before storage were sown in plots bio-fumigated by incorporating one-month old Indian mustard crop), respectively. The next best treatments were T-3 (bio-fumigation by incorporating one-month old Indian mustard crop) and T-4(T3 + compost culture to decompose bio-fumigant) which recorded a disease incidence of 25.0 and 31.7% and severity of 19.0 and 21.7%, respectively.

At Kanpur also, all the treatments significantly reduced CS incidence and severity from that of control. Highest severity of CS (12.5%) was recorded in plots where untreated diseased tubers were used (T-1). The minimum severity of CS (3.5%) was observed in T-3 (bio-fumigation by incorporating one-month old Indian mustard crop) followed by T-6 (soil application of pyrites @ 2.0 t/ha), T-4 (T3 + compost culture to decompose bio-fumigant), T-5 (T3 + Tuber dip treatment with 1.5% boric acid for 20 minutes before storage), and T-7 (T3 + Pyrites @ 2.0 t/ha) which were significantly at par with each other and reduced the disease severity to 5.5 to 7.1%.

**Table 897:** Experimental and treatment details

Centre	FZB	KAN	PAT
Year	2016-17	2016-17	2016-17
Replication	RBD	RBD	RBD
Spacing	60 X 20	60 X 20	60x20
Replications	4	4	-
Plot size (m <sup>2</sup> )	6.00	6.00	6.00
Variety	K Pukhraj	K Sindhuri	K Jyoti
Date of Planting	18.11.16	25.10.16	19.11.16
Date of Harvesting	27.02.17	10.03.17	20.03.17

### Treatments

- T1 : Untreated diseased tubers (Control)  
 T2 : Tuber dip treatment with 3% boric acid for 20 minutes before storage  
 T3 : Biofumigation by incorporating one month old Indian Mustard crop (seed rate 5 kg/ ha) just before the planting of potato crop  
 T4 : T3 + compost culture to decompose Biofumigant  
 T5 : T3 + Tuber dip treatment with 1.5% boric acid for 20 minutes before storage  
 T6 : Pyrites @ 2.0 t/ha (soil application)  
 T7 : T3 + Pyrites @ 2.0 t/ha

### FAIZABAD

**Table 898:** Disease incidence & indices and total yield (t/ha)

Treatments	No of tubers infected by common scab	Tuber surface area covered by common scab	Total yield (t/ha)
T1	60.00	35.68	24.55
T2	16.67	12.75	26.34
T3	31.67	21.65	23.94
T4	25.00	19.00	23.94
T5	18.33	14.50	24.51
T6	40.42	28.25	23.98
T7	33.34	20.75	24.32
SEd	1.56	0.87	1.05
CD(0.05)	3.30	1.83	NS
CV%	6.85	5.62	6.03

**KANPUR****Table 899:** Disease incidence & indices and total yield (t/ha)

Treatment	No of tubers infected by common scab	Tuber surface area covered by common scab	Total yield (t/ha)
T1	12.48	14.08	20.30
T2	7.13	7.38	22.30
T3	3.48	5.68	25.63
T4	4.63	6.93	22.42
T5	4.80	7.35	22.00
T6	4.48	7.15	23.25
T7	4.85	6.33	21.84
SEd	0.40	0.40	0.72
CD(0.05)	0.84	0.86	1.53
CV%	9.38	7.30	4.52

**PATNA****Table 900:** Late blight incidence total tuber yield (t/ha)

Treatment	Total yield (t/ha)
T1	29.08
T2	25.58
T3	24.76
T4	23.30
T5	29.32
T6	25.80
T7	29.50
SEd	4.72
CD(0.05)	NS
CV%	24.96

## ENTOMOLOGY

### ENT 1. MONITORING OF APHIDS, WHITEFLIES, THRIPS HOPPERS AND MITES IN UNSPRAYED CROP

The pattern of population dynamics of different pests in all AICRP (Potato) centers remained as follows: aphids were not recorded at Bhubneshwar in both the ware and seed crop but whitefly and leafhoppers were active in December and January. At Chhindwara *Myzus persicae* crossed the critical level (20 aphids/100 compound leaves) in first week of December and highest number was recorded in last week of January. *Aphis gossypii* was also very high during this period. Whitefly, leafhopper and thrips also attained their peak activity in mid January. At Deesa and Dholi *M. persicae* crossed the critical level after first week of January and the peak population of both aphids was attained in last week of February. At Deesa Whitefly and leafhopper started building up in January but thrips were present from December itself. Hassan had all the sucking pests in high number during the crop period. At Jorhat center *M. persicae* crossed the critical level in third week of December had highest population in last week of January and both PVY and PLRV could be recorded. In Kalyani, the aphids, *M. persicae* and *A. gossypii* were present and were recorded from 1<sup>st</sup> standard week to 6<sup>th</sup> standard week and *M. persicae* crossed the critical level in 3<sup>rd</sup> standard week. At Kalyani the *Epilachna* beetle was recorded from 52<sup>th</sup> standard week to 6<sup>th</sup> standard week. *Myzus persicae* crossed the critical level in first week of January at Kanpur. This year had been a very peculiar one for Modipuram as *M. persicae* crossed the critical level after mid January. *Aphis gossypii* was active throughout the winter months at Modipuram. At Ooty, whitefly was active during July and August. *Myzus persicae* was above critical level from first week of December and highest number per 100 compound leaves was in third week of January. *Aphis gossypii* at Pasighat remained active and continue to multiply throughout from December to second week of February. In Patna *M. persicae* crossed the critical level in first week of January and attained highest in third week of February. *Aphis gossypii* was highest in last week of January. *Myzus persicae*, *A. gossypii*, whitefly, leafhopper and thrips all sucking insects were recorded from the beginning of December month and *M. persicae* crossed the critical level in first week of December at Pune. At Raipur vector *M. persicae* crossed critical level after first week of December and all other sucking insects were also present December through February. *Myzus persicae* crossed critical level after 18<sup>th</sup> standard week at Shillong in June first week and in July again it was below the critical levels. *Myzus persicae* crossed the critical level in first week of June 2016 at Srinagar.

**Table 901:** Experimental details

Centre	BHN	CHN	DES	DHL	HSN	JRH
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Spacing	60 x 20	60 x 20	50 x 20	60 x 20	60 x 20	50 x 20
Plot size (m <sup>2</sup> )	10.80	10.80	20.00	400.00	21.60	150.00
Variety	K Ashoka	K Surya	K Badshah	K Ashoka	K Jyoti	K Pukhraj
Planting Date	17.11.16	08.11.16	17.11.16	25.12.16	18.06.16	15.11.16
Haulm cutting	26.01.17	24.02.17	26.02.17	25.02.17	19.09.16	13.02.17
Harvesting	02.02.17	03.03.17	27.02.17	25.04.17	26.09.16	20.02.17

Table contd...

Centre	KAL	KAN	KTT	MDP	OOT	PAS
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17
Spacing	60 x 20	60 x 20	60 x 20	60 x 20	60 x 20	60 x 20
Plot size (m <sup>2</sup> )	120.00	19.20	20.00	7.20	100.0	120.0
Variety	K Jyoti	K Anand	K Pukhraj	K Bahar	K Girdhari	K Jyoti
Planting Date	18.11.16	25.10.16	19.11.16	26.10.16	13.05.16	11.11.16
Haulm cutting	01.02.17	25.02.17	27.02.17	24.01.17	09.09.16	10.02.17
Harvesting	16.02.17	09.03.17	12.03.17	07.02.17	23.09.16	16.02.17

Table contd...

Centre	PAT	PUN	RPR	SHI	SRI
Year	2016-17	2016-17	2016-17	2016-17	2016-17
Spacing	60 x 20	60 x 20	60 x 20	60x20	60x20
Plot size (m <sup>2</sup> )	20.00	200	6.00	90.00	12.96
Variety	K Jyoti	K Pukhraj	K Jyoti	K Girdhari	Shalimar Potato-1
Planting Date	19.11.16	07.11.16	14.11.16	17.02.16	19.03.16
Haulm cutting	11.03.17	11.02.17	13.01.17		
Harvesting	21.03.17	15.02.17	20.01.17	26.09.16	28.07.16



## BHUBANESHWAR

**Table 902:** Monitoring of insect pests in potato in unsprayed ware crop and seed crop at weekly interval after the plant emergence till maturity

Pest	Unsprayed ware crop							
	Date of recording							
	December, 2016				January, 2017			
	09	16	23	30	06	13	20	27
<i>Myzus persicae</i> /100 compound leaves	0	0	0	0	0	0	0	0
<i>Aphis gossypii</i> /100 compound leaves	0	0	0	0	0	0	0	0
Whiteflies/10 fixed plants	79	159	172	183	162	113	92	61
Hoppers/10 fixed plants	86	102	125	135	124	92	54	10
Thrips/10 fixed plants	0	0	0	0	0	0	0	0
Mites (1-5 Scale)	0	0	0	0	0	0	0	0
<i>Other pests</i>	2	6	6	5	6	4	2	1

Table contd.....

Pest	Seed crop							
	Date of recording							
	December, 2016				January, 2017			
	09	16	23	30	06	13	20	27
<i>Myzus persicae</i> /100 compound leaves	0	0	0	0	0	0	0	0
<i>Aphis gossypii</i> /100 compound leaves	0	0	0	0	0	0	0	0
Whiteflies/10 fixed plants	43	9	8	11	7	5	4	3
Hoppers/10 fixed plants	18	11	10	5	5	5	4	2
Thrips/10 fixed plants	0	0	0	0	0	0	0	0
Mites (1-5 Scale)	0	0	0	0	0	0	0	0
<i>Other pests</i>	1	2	2	2	2	1	2	1

## CHHINDWARA

**Table 903:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Date of recording											
	Nov,16	December, 2016				January,2017				February, 2017		
	27	05	13	21	28	05	13	21	28	04	12	19
<i>Myzus persicae</i> /100 compound leaves	0	28	108	115	125	285	300	345	360	280	150	42
<i>Aphis gossypii</i> /100 compound leaves	0	25	55	85	95	120	140	175	145	90	48	18
Whiteflies/10 fixed plants	8	40	89	85	130	149	160	79	75	55	35	20
Hoppers/10 fixed plants	0	35	45	50	70	75	100	108	105	78	55	50
Thrips/10 fixed plants	0	0	10	25	65	80	101	150	175	180	60	45

## DEESA

**Table 904:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Date of recording									
	December, 2016		January,2017				February, 2017			
	21	28	03	11	20	27	06	13	20	
<i>Myzus persicae</i> /100 compound leaves	9	15	18	51	205	508	985	1476	1547	
<i>Aphis gossypii</i> /100 compound leaves	0	3	5	25	33	53	70	159	211	
Whiteflies/10 fixed plants	0	0	10	17	24	29	34	49	63	
Hoppers/10 fixed plants	0	0	3	5	11	14	16	22	24	

Thrips/10 fixed plants	12	16	26	34	49	56	59	68	71
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**Table 905:** Aphid transmitted virus incidence (visual symptoms and random ELISA test)

Treatments/Variety	Percent plant infected (visual observation /random ELISA test) with aphid transmitted viruses.	
	PVY	PLRV
K Badshah	0	7.5

#### DHOLI

**Table 906:** Monitoring of insect pests in potato in unsprayed ware crop at 10 days interval after the plant emergence till maturity

Pest	Date of recording									
	December, 2016		January, 2017				February, 2017			
	20	30	5	10	20	30	5	10	20	28
<i>Myzus persicae</i> /100 compound leaves	5	5	10	20	40	60	100	150	200	400
<i>Aphis gossypii</i> /100 compound leaves	0	0	10	25	40	60	100	120	150	180
Whiteflies/10 fixed plants	5	5	12	25	30	40	50	60	100	150

#### HASSAN

**Table 907:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Date of recording						
<i>Myzus persicae</i> /100 compound leaves	183	196	200	215	226	175	143
<i>Aphis gossypii</i> /100 compound leaves	112	136	158	172	189	122	110
Whiteflies/10 fixed plants	28	35	43	48	33	26	18
Hoppers/10 fixed plants	22	28	33	45	30	26	15
Thrips/10 fixed plants	35	50	54	42	36	31	26
Mites (1-5 Scale)	20	24	24	36	40	46	52

**Table 908:** Aphid transmitted virus incidence (visual symptoms and random ELISA test)

Treatments/Variety	Percent plant infected (visual observation /random ELISA test) with aphid transmitted viruses.	
	PVY	PLRV
K Jyoti	24	15

#### JORHAT

**Table 909:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Date of recording											
	December, 2016				January, 2017				February, 2017			
	05	13	19	26	02	09	16	23	30	07	13	20
<i>Myzus persicae</i> /100 compound leaves	3	11	13	19	24	37	48	78	311	239	185	26

**Table 910:** Aphid transmitted virus incidence (visual symptoms and random ELISA test)

Treatments/Variety	Percent plant infected (visual observation /random ELISA test) with aphid transmitted viruses.	
	PVY	PLRV
K Pukhraj	13.6	31.6

## KALYANI

**Table 911:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Standard week								
	50	51	52	01	02	03	04	05	06
<i>Myzus persicae</i> /100 compound leaves	0	0	0	3	12	24	46	52	60
<i>Aphis gossypii</i> /100 compound leaves	0	0	0	1	5	16	22	34	36
Whiteflies/10 fixed plants	6	11	7	0	0	0	5	26	17
Hoppers/10 fixed plants	0	6	10	8	3	0	0	0	0
Epilachna beetle/10 fixed plants	8	9	13	21	40	89	137	153	176

## KANPUR

**Table 912:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Date of recording											
	December, 2016				January, 2017					Feb., 2017		
	03	10	17	24	01	08	15	22	29	04	11	18
<i>Myzus persicae</i> /100 compound leaves	6	10	14	15	21	27	68	121	324	492	285	263
<i>Aphis gossypii</i> /100 compound leaves	4	10	9	31	23	41	101	152	294	264	187	96
Whiteflies/10 fixed plants	2	3	1	0	0	0	2	3	3	7	9	10
Thrips/10 fixed plants	0	0	0	0	0	0	2	4	5	6	3	4

**Table 913:** Monitoring of insect pests in potato in seed crop at weekly interval after the plant emergence till 75 days

Pest	Date of recording											
	December, 2016				January, 2017					Feb., 2017		
	03	10	17	24	01	08	15	22	29	04	11	18
<i>Myzus persicae</i> /100 compound leaves	4	6	10	8	13	17	21	63	195	181	103	117
<i>Aphis gossypii</i> /100 compound leaves	1	5	4	13	11	19	29	64	81	102	41	39
Whiteflies/10 fixed plants	2	5	2	1	0	0	1	2	1	3	4	3
Thrips/10 fixed plants	0	0	0	0	0	0	0	0	2	2	1	1

**Table 914:** Aphid transmitted virus incidence (visual symptoms and random ELISA test)

Treatments/Variety	Percent plant infected (visual observation with aphid transmitted viruses.	
	PVY	PLRV
K Anand	2.5	2.8

## KOTA

**Table 915:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Standard week				
	3	4	5	6	7
<i>Myzus persicae</i> /100 compound leaves	6	13	17	22	28
<i>Aphis gossypii</i> /100 compound leaves	9	12	18	18	22

## MODIPURAM

**Table 916:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Date of recording								
	December, 2016		January, 2017				February, 2017		
	19	24	05	14	22	28	06	15	24
<i>Myzus persicae</i> /100 compound leaves	0	0	0	0	0	0	7	15	35
<i>Aphis gossypii</i> /100 compound leaves	10	8	14	7	6	4	11	11	26
Whiteflies/10 fixed plants	8	2	8	4	2	2	2	1	0
Hoppers/10 fixed plants	2	1	0	0	0	0	0	0	0
Thrips/10 fixed plants	0	0	0	0	0	0	0	0	0
Mites (1-5 Scale)	0	0	5	5	5	4	4	4	3

## OOTY

**Table 917:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Date of recording						
	At 40 DAP	19.7.16	25.7.16	11.8.16	8.8.16	23.8.16	At harvest
<i>Aphids</i> /100 compound leaves	-	0	5	5	3	3	-
Whiteflies/10 fixed plants	-	31	31	63	110	132	-
Hoppers/10 fixed plants	-	1	0	5	3	17	-
Cutworm	117	-	-	-	-	-	-
PTM (at harvest)	-	-	-	-	-	-	19
White grub (at harvest per 10 kg)	-	-	-	-	-	-	7
Common Scab (at harvest per 10 kg)	-	-	-	-	-	-	69
Powdery scab (at harvest per 10 kg)	-	-	-	-	-	-	34

## PASIGHAT

**Table 918:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Date of recording									
	December, 2016				January, 2017				February, 2017	
	1 <sup>st</sup> week	2 <sup>nd</sup> week	3 <sup>rd</sup> week	4 <sup>th</sup> week	1 <sup>st</sup> week	2 <sup>nd</sup> week	3 <sup>rd</sup> week	4 <sup>th</sup> week	1 <sup>st</sup> week	2 <sup>nd</sup> week
<i>Myzus persicae</i> /100 compound leaves	24	28	29	37	62	95	110	90	55	65
<i>Aphis gossypii</i> /100 compound leaves	0	12	18	22	27	29	23	26	39	48

## PATNA

**Table 919:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Date of recording										
	December, 2016				January, 2017				February, 2017		
	4	12	20	28	6	14	21	29	6	13	20
<i>Myzus persicae</i> /100 compound leaves	0	4	14	16	28	52	75	203	572	980	1634
<i>Aphis gossypii</i> /100 compound leaves	5	12	20	44	76	98	118	184	58	32	12
Whiteflies/10 fixed plants	0	2	6	14	6	7	12	6	8	12	8

## PUNE

**Table 920:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Date of recording							
	December, 2016				January, 2017			
	01	10	19	29	09	18	30	10
<i>Myzus persicae</i> /100 compound leaves	101	78	196	172	197	141	103	97
<i>Aphis gossypii</i> /100 compound leaves	51	72	107	51	54	47	59	44
Whiteflies/10 fixed plants	13	21	17	29	43	61	76	54
Hoppers/10 fixed plants	41	34	47	39	27	22	18	25
Thrips/10 fixed plants		5	18	24	19	3		

**Table 921:** Aphid transmitted virus incidence

Treatments/Variety	Percent plant infected (visual observation with aphid transmitted viruses.	
	PVY	PLRV
K Pukhraj	2.35	5.95

## RAIPUR

**Table 922:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Date of recording										
	December, 2016				January, 2017				February, 2017		
	08	15	22	29	05	12	19	26	02	09	16
<i>Myzus persicae</i> /100 compound leaves	14	48	61	61	109	133	168	109	58	39	23
<i>Aphis gossypii</i> /100 compound leaves	7	21	37	33	46	34	84	45	24	18	15
Whiteflies/10 fixed plants	0	18	31	21	20	26	47	27	19	8	0
Hoppers/10 fixed plants	0	11	24	35	16	28	38	23	14	4	0
Thrips/10 fixed plants	0	11	16	26	34	33	50	25	16	7	0

**Table 923:** Monitoring of insect pests in potato in seed crop at weekly interval after the plant emergence till maturity

Pest	Date of recording											
	December, 2016				January, 2017				February, 2017			
	08	15	22	29	05	12	19	26	02	09	16	
<i>Myzus persicae</i> /100 compound leaves	6	20	26	25	48	70	79	58	24	17	9	
<i>Aphis gossypii</i> /100 compound leaves	3	11	14	20	22	15	41	21	10	8	6	
Whiteflies/10 fixed plants	0	5	10	12	8	6	13	12	8	2	0	
Hoppers/10 fixed plants	0	4	8	10	9	10	15	9	5	2	0	
Thrips/10 fixed plants	0	4	9	10	12	10	9	25	12	3	0	

## SHILLONG

**Table 924:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Standard week						
	18 <sup>th</sup> week	19 <sup>th</sup> week	20 <sup>th</sup> week	21 <sup>st</sup> week	22 <sup>nd</sup> week	23 <sup>rd</sup> week	24 <sup>th</sup> week
<i>Myzus persicae</i> /100 compound leaves	17	40	158	81	19	6	2

**SRINAGAR****Table 925:** Monitoring of insect pests in potato in unsprayed ware crop at weekly interval after the plant emergence till maturity

Pest	Date of recording											
	May, 2016				June, 2016				July, 2016			
	1 <sup>st</sup> week	2 <sup>nd</sup> week	3 <sup>rd</sup> week	4 <sup>th</sup> week	1 <sup>st</sup> week	2 <sup>nd</sup> week	3 <sup>rd</sup> week	4 <sup>th</sup> week	1 <sup>st</sup> week	2 <sup>nd</sup> week	3 <sup>rd</sup> week	4 <sup>th</sup> week
<i>Myzus persicae</i> /100 compound leaves	8.50	10.00	13.50	17.50	22.50	25.50	28.25	24.00	18.00	12.50	7.00	4.50

## Ent-2: USE OF PARTICLE FILM TECHNOLOGY FOR THE MANAGEMENT OF APHIDS AND WHITEFLIES IN POTATO

Experiments were conducted at different centers to manage sucking pest by the use of black mulch and particle film of Kaolin. The results obtained at Bhubneshwar indicated that compared to control the kaolin film was effective against aphids, whiteflies, leafhoppers, *Spodoptera* and *Helicoverpa* in mulch and no mulch treatments but not better than chemical control. At Chhindwara there seems to be no effect of mulch and different doses of kaolin treatments on pest population as no set pattern of control could be observed by particle film technology. At Deesa also there was no significant effect of use of mulch and particle film was found on pest/vector population. In Hassan the effect of mulch and kaolin treatments had significant effect in reducing aphid and whitefly population till first week of October but had little effect on leafhopper and thrips. Mulching had significant effect on yields of potato. At Kalyani the effect of particle film of kaolin was significant on yield of potato as higher yields were obtained in kaolin treatments. The effect of mulch on whitefly was significant at Modipuram in first week of December but not later as population of whitefly dwindles after December due to low temperatures, also effect of mulch was significant on yield and the quality of tubers. The yields were not good in kaolin treatments as leaves died earlier due to covering of kaolin. At Patna, treatments of kaolin combined with black mulch were found significant in the control of aphids and whitefly. The results obtained at Pune reflected that use of mulch and particle film was significant in reducing aphids but non-significant in case of whiteflies. In case of leafhopper control and yields in different treatments, the effect of kaolin film with black mulch was non-significant. At Raipur this technology resulted into successful controlling of aphids, whiteflies, leafhoppers and thrips, although there were no significant differences among the yields obtained in different treatments with mulch.

**Table 926:** Experimental details

Centre	BHN	CHN	DES	HSN	KAL	MDP	PAT	PUN	RPR
Year	2016-17	2016-17	2016-17	2016-17	2016-17	2016-17	1016-17	2016-17	2016-17
Design	RBDF	RBDF	RBDF	RBDF	RBDF	RBDF	RBDF	RBDF	RBDF
Replication	4	4	4	4	4	4	4	4	3
Spacing	60x20	60x20	50x20	50x20	60x20	60x20	60x20	60x20	60x20
Plot size (gross m <sup>2</sup> )	7.20	7.20	9.00	2.00	9.00	7.20	19.20	6.00	4.80
Variety	K Ashoka	K Pushkar	K Ashoka	K Jyoti	K Jyoti	K Bahar	K Jyoti	K Pukhraj	K Jyoti
Planting Date	28.11.16	10.11.16	18.11.16	08.07.16	04.12.16	24.10.16	22.11.16	13.07.16	15.11.16
Harvesting	15.02.17	01.03.17	09.03.17	17.10.16	12.03.17	03.03.17	22.03.17	07.10.16	21.02.17
First spray	24.12.16	11.12.16	29.12.16	15.08.16	04.01.17	29.11.16		14.08.16	
Second spray	08.01.17	26.12.16	20.01.17	24.08.16	19.01.17	17.12.16		30.08.16	
Third spray		11.01.17	06.02.17	01.09.16	04.02.17			15.09.16	
Observation Date									
1 <sup>st</sup>	20.12.16	05.12.16	14.12.16	16.08.16	03.01.17	24.11.16			
2 <sup>nd</sup>	27.12.16	13.12.16	21.12.16	25.08.16	10.01.17	05.12.16			
3 <sup>rd</sup>	04.01.17	21.12.16	28.12.16	02.09.16	17.01.17	16.12.16			
4 <sup>th</sup>	11.01.17	28.12.16	03.01.17	09.09.16	24.01.17	28.12.16			
5 <sup>th</sup>	18.01.17	05.01.17	11.01.17	16.09.16	31.01.17	06.01.17			
6 <sup>th</sup>	27.01.17	13.01.17	20.01.17	23.09.16	07.02.17	12.01.17			
7 <sup>th</sup>	04.02.17	21.01.17	27.01.17	30.09.16	14.02.17	19.01.17			
8 <sup>th</sup>		28.01.17	06.02.17	07.10.16	21.02.17	23.01.17			
9 <sup>th</sup>		04.02.17	13.02.17		28.02.17				
10 <sup>th</sup>		12.02.17	20.02.17						

### Treatments details

#### Treatments

T<sub>1</sub> : Control

T<sub>2</sub> : Imidacloprid 17.8SL @0.03%

T<sub>3</sub> : Kaolin @1.25%

T<sub>4</sub> : Kaolin @2.5%

T<sub>5</sub> : Kaolin @3.75%

#### Mulching

M<sub>0</sub>: No mulch

M<sub>1</sub>: Mulching with black polythene

X

Variety : Recommended variety of the area (Good quality Seed)

**BHUBANESWAR**

**Table 927:** Population of white flies/10 fixed plots, hoppers/10 fixed plots, spodoptera/10 fixed plants, helicoverpa/ 10 fixed plants recorded and total yield (t/ha)

Treatments	Whiteflies/10 fixed plants on 20.12.16						Whiteflies/10 fixed plants on 27.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	173.25	168.75	173.25	170.75	165.25	170.25	174.00	11.50	70.50	33.00	28.25	63.45
M1	168.75	169.00	168.25	168.25	167.50	168.35	169.00	10.25	67.00	29.25	26.75	60.45
Means	171.00	168.88	170.75	169.50	166.38		171.50	10.88	68.75	31.13	27.50	
SE (M)	3.69						1.73					
SE (T)	5.83						2.73					
SE (MT)	8.25						3.86					
CD (M)	NS						NS					
CD (T)	NS						5.63					
CD (MT)	NS						NS					
Treatments	Whiteflies/10 fixed plants on 04.01.17						Whiteflies/10 fixed plants on 11.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	170.00	31.50	83.75	45.50	42.50	74.65	137.75	8.50	53.25	24.00	21.25	48.95
M1	166.00	23.75	77.50	43.50	40.50	70.25	133.75	9.25	59.50	22.00	20.75	49.05
Means	168.00	27.63	80.63	44.50	41.50		135.75	8.88	56.38	23.00	21.00	
SE (M)	3.00						1.64					
SE (T)	4.75						2.59					
SE (MT)	6.71						3.66					
CD (M)	NS						NS					
CD (T)	9.79						5.34					
CD (MT)	NS						NS					
Treatments	Whiteflies/10 fixed plants on 18.01.17						Whiteflies/10 fixed plants on 27.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	136.25	25.50	76.25	39.00	32.75	61.95	126.00	18.75	70.50	34.50	25.75	55.10
M1	134.50	22.00	67.75	39.50	33.75	59.50	124.50	16.00	62.50	32.75	24.25	52.00
Means	135.38	23.75	72.00	39.25	33.25		125.25	17.38	66.50	33.63	25.00	
SE (M)	2.21						1.66					
SE (T)	3.50						2.63					
SE (MT)	4.95						3.72					
CD (M)	NS						NS					
CD (T)	7.22						5.425					
CD (MT)	NS						NS					
Treatments	Whiteflies/10 fixed plants on 04.02.17						Hoppers/10 fixed plants on 20.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	73.75	NS	30.25	14.50	10.75	27.05	161.50	163.75	164.00	163.25	164.00	163.30
M1	71.00	5.00	29.00	11.75	9.50	25.25	155.25	154.25	158.75	159.00	157.00	156.85
Means	72.38	5.50	29.63	13.13	10.13		158.38	159.00	161.38	161.13	160.50	
SE (M)	0.96						2.44					
SE (T)	1.52						3.86					
SE (MT)	2.15						5.46					
CD (M)	NS						5.04					
CD (T)	3.13						NS					
CD (MT)	NS						NS					
Treatments	Hoppers/10 fixed plants on 27.12.16						Hoppers/10 fixed plants on 04.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	162.75	13.00	72.50	21.25	17.75	57.45	137.00	17.75	52.50	28.50	23.00	51.75
M1	158.75	14.50	68.75	20.25	16.75	55.80	131.25	15.50	50.75	26.50	22.00	49.20
Means	160.75	13.75	70.63	20.75	17.25		134.13	16.63	51.63	27.50	22.50	
SE (M)	1.98						1.37					
SE (T)	3.13						2.16					
SE (MT)	4.42						3.06					
CD (M)	NS						NS					
CD (T)	6.45						4.46					
CD (MT)	NS						NS					
Treatments	Hoppers/10 fixed plants on 11.01.17						Hoppers/10 fixed plants on 18.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	123.75	12.25	33.75	16.00	13.75	39.90	115.50	9.50	31.75	15.00	12.75	36.90



M1	118.00	10.00	32.00	14.50	11.25	37.15	103.75	8.00	27.00	10.50	9.25	31.70
Means	120.88	11.13	32.88	15.25	12.50		109.63	8.75	29.38	12.75	11.00	
SE (M)	1.18					1.41						
SE (T)	1.87					2.23						
SE (MT)	2.65					3.16						
CD (M)	2.44					2.92						
CD (T)	3.86					4.61						
CD (MT)	NS					NS						
Treatments	Hoppers/10 fixed plants on 27.01.17						Hoppers/10 fixed plants on 04.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	92.75	4.25	21.00	9.50	7.50	27.00	27.25	2.50	10.75	4.25	3.50	9.65
M1	89.00	3.75	15.00	8.00	6.50	24.45	24.25	3.00	9.50	3.75	2.50	8.60
Means	90.88	4.00	18.00	8.75	7.00		25.75	2.75	10.13	4.00	3.00	
SE (M)	1.36					1.02						
SE (T)	2.15					1.61						
SE (MT)	3.05					2.28						
CD (M)	NS					NS						
CD (T)	4.44					3.33						
CD (MT)	NS					NS						
Treatments	Spodoptera on 20.12.16						Spodoptera on 27.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	5.00	4.75	4.25	4.75	4.50	4.65	5.25	0.50	1.25	0.25	0.00	1.45
M1	5.50	5.00	5.25	4.75	4.75	5.05	5.00	1.00	1.25	0.50	0.25	1.60
Means	5.25	4.88	4.75	4.75	4.63		5.13	0.75	1.25	0.38	0.13	
SE (M)	0.57					0.28						
SE (T)	0.90					0.45						
SE (MT)	1.28					0.63						
CD (M)	NS					NS						
CD (T)	NS					0.92						
CD (MT)	NS					NS						
Treatments	Spodoptera on 04.01.17						Spodoptera on 11.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	3.75	0.75	1.00	0.00	0.00	1.10	3.50	0.00	0.50	0.00	0.00	0.80
M1	4.00	1.00	1.00	0.50	0.00	1.30	4.00	0.00	0.75	0.25	0.00	1.00
Means	3.88	0.88	1.00	0.25	0.00		3.75	0.00	0.63	0.13	0.00	
SE (M)	0.27					0.18						
SE (T)	0.43					0.28						
SE (MT)	0.61					0.39						
CD (M)	NS					NS						
CD (T)	0.89					0.57						
CD (MT)	NS					NS						
Treatments	Spodoptera on 18.01.17						Spodoptera on 27.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	3.00	0.25	0.50	0.25	0.00	0.80	2.00	0.50	0.50	0.25	0.00	0.65
M1	3.25	0.25	0.75	0.25	0.25	0.95	1.75	0.25	0.75	0.50	0.25	0.70
Means	3.13	0.25	0.63	0.25	0.13		1.88	0.38	0.63	0.38	0.13	
SE (M)	0.24					0.24						
SE (T)	0.38					0.38						
SE (MT)	0.54					0.54						
CD (M)	NS					NS						
CD (T)	0.78					0.79						
CD (MT)	NS					NS						
Treatments	Spodoptera on 04.02.17						Helicoverpa on 20.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	1.00	0.50	0.75	0.50	0.00	0.55	1.00	0.75	0.00	1.00	0.50	0.65
M1	1.50	0.25	0.50	0.25	0.25	0.55	0.25	0.75	0.25	0.00	0.50	0.35
Means	1.25	0.38	0.63	0.38	0.13		0.63	0.75	0.13	0.50	0.50	
SE (M)	0.23					0.19						
SE (T)	0.36					0.30						
SE (MT)	0.51					0.43						
CD (M)	NS					NS						
CD (T)	0.74					NS						
CD (MT)	NS					NS						
Treatments	Helicoverpa on 27.12.16						Helicoverpa on 04.01.17					

	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	1.50	0.00	1.00	0.50	0.25	0.65	1.75	0.00	1.25	0.75	0.50	0.85
M1	1.00	0.00	0.75	0.25	0.00	0.40	1.25	0.00	1.00	0.75	0.25	0.65
Means	1.25	0.00	0.88	0.38	0.13		1.50	0.00	1.13	0.75	0.38	
SE (M)	0.23						0.18					
SE (T)	0.36						0.29					
SE (MT)	0.51						0.41					
CD (M)	NS						NS					
CD (T)	0.74						0.60					
CD (MT)	NS						NS					
Treatments	<b>Helicoverpa on 11.01.17</b>						<b>Helicoverpa on 18.01.17</b>					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	1.50	0.00	0.75	0.25	0.00	0.50	1.75	0.00	1.00	0.50	0.25	0.70
M1	1.00	0.00	0.75	0.50	0.25	0.50	1.25	0.00	0.75	0.25	0.25	0.50
Means	1.25	0.00	0.75	0.38	0.13		1.50	0.00	0.88	0.38	0.25	
SE (M)	0.21						0.21					
SE (T)	0.33						0.33					
SE (MT)	0.46						0.46					
CD (M)	NS						NS					
CD (T)	0.68						0.67					
CD (MT)	NS						NS					
Treatments	<b>Helicoverpa on 27.01.17</b>						<b>Helicoverpa on 04.02.17</b>					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	2.00	0.50	1.25	0.25	0.25	0.85	1.00	0.25	1.00	0.00	0.00	0.45
M1	1.75	0.25	1.00	0.25	0.00	0.65	1.25	0.50	0.75	0.25	0.00	0.55
Means	1.88	0.38	1.13	0.25	0.13		1.13	0.38	0.88	0.13	0.00	
SE (M)	0.21						0.20					
SE (T)	0.33						0.31					
SE (MT)	0.47						0.44					
CD (M)	NS						NS					
CD (T)	0.69						0.64					
CD (MT)	NS						NS					
Treatments	<b>Total yield (t/ha)</b>											
	T1	T2	T3	T4	T5	Means						
M0	10.65	15.07	11.76	13.55	13.68	12.94						
M1	10.92	15.61	12.78	14.78	14.56	13.73						
Means	10.78	15.34	12.27	14.16	14.12							
SE (M)	0.13											
SE (T)	0.21											
SE (MT)	0.29											
CD (M)	0.27											
CD (T)	0.42											
CD (MT)	NS											

## CHHINDWARA

**Table 928:** Population of aphid/100 compound leaves, white flies/10 fixed plots, hoppers/10 fixed plots, thrips/10 fixed plants recorded and total yield (t/ha)

Treatments	Aphid/100 compound leaves on 05.12.16						Aphid/100 compound leaves on 13.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	25.25	31.75	25.50	19.75	29.00	26.25	120.25	93.00	115.75	111.25	108.25	109.70
M1	23.00	24.00	23.00	24.00	25.25	23.85	104.25	109.00	115.00	88.25	125.00	108.30
Means	24.13	27.88	24.25	21.88	27.13		112.25	101.00	115.38	99.75	116.63	
SE (M)	0.59						1.92					
SE (T)	0.92						3.03					
SE (MT)	1.31						4.29					
CD (M)	1.21						NS					
CD (T)	1.91						6.25					
CD (MT)	2.70						8.84					
	Aphid/100 compound leaves on 21.12.16						Aphid/100 compound leaves on 28.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	133.75	96.25	133.25	126.25	125.75	123.05	144.00	103.25	147.25	139.25	142.00	135.15

M1	124.25	124.00	125.00	92.50	135.00	120.15	134.25	134.00	130.75	99.00	142.50	128.10
Means	129.00	110.13	129.13	109.38	130.38		139.13	118.63	139.00	119.13	142.25	
SE (M)	1.79						1.38					
SE (T)	2.83						2.18					
SE (MT)	4.01						3.08					
CD (M)	NS						2.84					
CD (T)	5.84						4.49					
CD (MT)	8.27						6.35					
	Aphid/100 compound leaves on 05.01.17						Aphid/100 compound leaves on 13.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	290.25	259.75	282.75	288.00	269.50	278.05	310.25	274.00	300.25	308.00	289.50	296.40
M1	300.25	255.50	272.00	276.00	291.25	279.00	322.75	275.50	289.50	296.00	311.25	299.00
Means	295.25	257.63	277.38	282.00	280.38		316.50	274.75	294.88	302.00	300.38	
SE (M)	2.86						3.52					
SE (T)	4.52						5.56					
SE (MT)	6.40						7.87					
CD (M)	NS						NS					
CD (T)	9.33						11.48					
CD (MT)	13.20						16.23					
	Aphid/100 compound leaves on 21.01.17						Aphid/100 compound leaves on 28.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	260.25	224.00	250.25	255.50	239.50	245.90	161.75	133.75	147.50	139.50	140.25	144.55
M1	272.75	225.50	239.50	245.50	259.50	248.55	145.25	120.75	141.25	129.50	138.25	135.00
Means	266.50	224.75	244.88	250.50	249.50		153.50	127.25	144.38	134.50	139.25	
SE (M)	3.56						1.74					
SE (T)	5.62						2.75					
SE (MT)	7.95						3.88					
CD (M)	NS						3.58					
CD (T)	11.60						5.66					
CD (MT)	16.41						NS					
	Aphid/100 compound leaves on 04.02.17						Aphid/100 compound leaves on 12.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	86.75	76.75	91.50	93.25	102.75	90.20	43.25	25.75	35.75	38.25	43.25	37.25
M1	70.50	67.00	79.00	79.00	89.25	76.95	19.00	30.25	33.25	36.75	37.50	31.35
Means	78.63	71.88	85.25	86.13	96.00		31.13	28.00	34.50	37.50	40.38	
SE (M)	1.23						1.07					
SE (T)	1.95						1.70					
SE (MT)	2.76						2.40					
CD (M)	2.54						2.22					
CD (T)	4.02						3.50					
CD (MT)	NS						4.95					
	Whiteflies/10 fixed plants on 05.12.16						Whiteflies/10 fixed plants on 13.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	40.00	32.75	35.50	39.50	42.75	38.10	80.00	72.75	77.50	82.00	82.75	79.00
M1	34.25	29.25	32.00	35.00	31.50	32.40	83.25	68.25	79.25	86.75	88.00	81.10
Means	37.13	31.00	33.75	37.25	37.13		81.63	70.50	78.38	84.38	85.38	
SE (M)	0.97						1.18					
SE (T)	1.54						1.86					
SE (MT)	2.18						2.63					
CD (M)	2.01						NS					
CD (T)	3.17						3.84					
CD (MT)	NS						NS					
	Whiteflies/10 fixed plants on 21.12.16						Whiteflies/10 fixed plants on 28.12.16					
	T1	T2	T3	T4	T5	Mean	T1	T2	T3	T4	T5	Means
M0	100.00	82.00	96.25	94.50	100.25	94.60	110.25	90.25	106.25	104.75	110.25	104.35
M1	100.75	77.50	89.25	96.75	98.00	92.45	110.75	87.50	96.75	106.75	108.00	101.95
Means	100.38	79.75	92.75	95.63	99.13		110.50	88.88	101.50	105.75	109.13	
SE (M)	1.85						1.73					
SE (T)	2.92						2.74					
SE (MT)	4.13						3.87					
CD (M)	NS						NS					
CD (T)	6.03						5.65					
CD (MT)	NS						NS					
	Whiteflies/10 fixed plants on 05.01.17						Whiteflies/10 fixed plants on 13.01.17					

	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means		
M0	138.25	120.25	140.00	135.00	140.25	134.75	180.00	132.50	166.75	157.00	178.25	162.90		
M1	133.25	118.00	121.75	134.25	130.50	127.55	169.50	119.75	161.75	161.25	158.50	154.15		
Means	135.75	119.13	130.88	134.63	135.38		174.75	126.13	164.25	159.13	168.38			
SE (M)	2.05						3.23							
SE (T)	3.24						5.11							
SE (MT)	4.58						7.23							
CD (M)	4.22						6.67							
CD (T)	6.67						10.55							
CD (MT)	NS						NS							
	Whiteflies/10 fixed plants on 21.01.17							Whiteflies/10 fixed plants on 28.01.17						
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means		
M0	210.00	162.50	196.75	187.00	205.50	192.35	219.25	170.25	206.00	197.50	213.00	201.20		
M1	199.50	149.75	191.75	191.25	188.50	184.15	209.25	161.00	201.00	201.25	199.25	194.35		
Means	204.75	156.13	194.25	189.13	197.00		214.25	165.63	203.50	199.38	206.13			
SE (M)	3.18						3.01							
SE (T)	5.03						4.76							
SE (MT)	7.11						6.73							
CD (M)	6.56						6.21							
CD (T)	10.38						9.81							
CD (MT)	NS						NS							
	Whiteflies/10 fixed plants on 04.02.17							Whiteflies/10 fixed plants on 12.02.17						
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means		
M0	104.25	56.25	86.00	80.00	93.00	83.90	71.75	35.25	56.00	50.75	63.00	55.35		
M1	89.25	44.75	81.00	81.25	80.25	75.30	56.50	30.50	51.00	48.75	52.75	47.90		
Means	96.75	50.50	83.50	80.63	86.63		64.13	32.88	53.50	49.75	57.88			
SE (M)	2.64						2.27							
SE (T)	4.18						3.59							
SE (MT)	5.91						5.08							
CD (M)	5.45						4.69							
CD (T)	8.61						7.41							
CD (MT)	NS						NS							
	Hoppers/10 fixed plants on 05.12.16							Hoppers/10 fixed plants on 13.12.16						
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means		
M0	38.50	32.75	30.50	31.25	29.50	32.50	48.50	40.25	43.00	41.25	39.50	42.50		
M1	31.75	27.00	25.00	25.75	29.50	27.80	41.75	31.50	35.25	35.75	39.50	36.75		
Means	35.13	29.88	27.75	28.50	29.50		45.13	35.88	39.13	38.50	39.50			
SE (M)	1.10						1.41							
SE (T)	1.74						2.23							
SE (MT)	2.46						3.16							
CD (M)	2.27						2.91							
CD (T)	3.58						4.61							
CD (MT)	NS						NS							
	Hoppers/10 fixed plants on 21.12.16							Hoppers/10 fixed plants on 28.12.16						
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means		
M0	58.50	50.25	50.00	49.50	47.25	51.10	68.50	60.25	60.00	59.50	57.25	61.10		
M1	51.75	41.50	44.00	43.75	49.50	46.10	61.75	51.50	54.00	53.75	59.50	56.10		
Means	55.13	45.88	47.00	46.63	48.38		65.13	55.88	57.00	56.63	58.38			
SE (M)	1.07						1.07							
SE (T)	1.69						1.69							
SE (MT)	2.39						2.39							
CD (M)	2.21						2.21							
CD (T)	3.49						3.49							
CD (MT)	4.93						4.93							
	Hoppers/10 fixed plants on 05.01.17							Hoppers/10 fixed plants on 13.01.17						
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means		
M0	78.50	71.00	70.00	69.50	67.25	71.25	88.00	81.25	80.50	77.75	77.25	80.95		
M1	71.75	62.75	65.00	63.75	69.00	66.45	81.75	72.25	75.25	73.75	76.75	75.95		
Means	75.13	66.88	67.50	66.63	68.13		84.88	76.75	77.88	75.75	77.00			
SE (M)	1.09						1.04							
SE (T)	1.72						1.64							
SE (MT)	2.43						2.32							
CD (M)	2.24						2.14							
CD (T)	3.54						3.39							

CD (MT)	NS						NS					
	: Hoppers/10 fixed plants on 21.01.17						Hoppers/10 fixed plants on 28.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	105.00	95.00	97.75	97.00	97.25	98.40	130.00	117.50	122.75	122.00	122.25	122.90
M1	97.50	92.25	95.25	92.50	99.25	95.35	122.50	104.75	114.00	117.25	124.25	116.55
Means	101.25	93.63	96.50	94.75	98.25		126.25	111.13	118.38	119.63	123.25	
SE (M)	0.96						1.09					
SE (T)	1.52						1.72					
SE (MT)	2.15						2.44					
CD (M)	1.98						2.25					
CD (T)	3.13						3.56					
CD (MT)	NS						5.03					
	Hoppers/10 fixed plants on 04.02.17						Hoppers/10 fixed plants on 12.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	152.50	134.00	142.75	142.50	142.50	142.85	68.50	50.50	60.50	59.25	60.75	59.90
M1	143.75	126.75	136.50	137.00	143.00	137.40	59.50	42.75	52.00	53.00	56.25	52.70
Means	148.13	130.38	139.63	139.75	142.75		64.00	46.63	56.25	56.13	58.50	
SE (M)	1.36						1.25					
SE (T)	2.15						1.98					
SE (MT)	3.04						2.80					
CD (M)	2.81						2.59					
CD (T)	4.44						4.09					
CD (MT)	NS						NS					
	Thrips/10 fixed plants on 13.12.16						Thrips/10 fixed plants on 21.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	13.50	8.00	13.00	9.75	11.50	11.15	20.75	19.50	25.75	30.50	38.00	26.90
M1	10.00	5.75	11.25	9.75	10.25	9.40	20.25	14.00	21.50	25.00	24.50	21.05
Means	11.75	6.88	12.13	9.75	10.88		20.50	16.75	23.63	27.75	31.25	
SE (M)	0.52						1.58					
SE (T)	0.82						2.50					
SE (MT)	1.16						3.54					
CD (M)	1.07						3.26					
CD (T)	1.69						5.16					
CD (MT)	NS						NS					
	Thrips/10 fixed plants on 28.12.16						Thrips/10 fixed plants on 05.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	30.75	34.50	35.75	43.00	55.50	39.90	93.00	72.00	85.75	93.00	95.50	87.85
M1	29.00	24.00	26.75	35.00	32.25	29.40	84.00	71.50	79.25	85.00	87.25	81.40
Means	29.88	29.25	31.25	39.00	43.88		88.50	71.75	82.50	89.00	91.38	
SE (M)	1.59						1.32					
SE (T)	2.51						2.08					
SE (MT)	3.55						2.95					
CD (M)	3.28						2.72					
CD (T)	5.18						4.30					
CD (MT)	7.33						NS					
	Thrips/10 fixed plants on 13.01.17						Thrips/10 fixed plants on 21.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	103.00	84.50	95.75	103.00	105.50	98.35	118.00	100.50	110.75	118.00	119.50	113.35
M1	91.75	81.50	89.25	95.00	97.00	90.90	105.50	96.50	104.25	110.00	113.00	105.85
Means	97.38	83.00	92.50	99.00	101.25		111.75	98.50	107.50	114.00	116.25	
SE (M)	1.26						1.29					
SE (T)	1.99						2.04					
SE (MT)	2.82						2.88					
CD (M)	2.60						2.66					
CD (T)	4.11						4.20					
CD (MT)	NS						NS					
	Thrips/10 fixed plants on 28.01.17						Thrips/10 fixed plants on 04.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	169.75	150.50	160.75	168.00	169.50	163.70	179.50	159.00	170.75	176.25	179.50	173.00
M1	155.50	146.50	154.25	160.00	160.50	155.35	166.00	153.75	163.75	170.00	169.25	164.55
Means	162.63	148.50	157.50	164.00	165.00		172.75	156.38	167.25	173.13	174.38	
SE (M)	1.27						1.27					
SE (T)	2.00						2.01					
SE (MT)	2.83						2.84					

CD (M)	2.61						2.62					
CD (T)	4.13						4.14					
CD (MT)	NS						NS					
	Thrips/10 fixed plants on 12.02.17						Total yield (t/ha)					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	76.50	64.50	75.75	81.25	84.75	76.55	20.76	30.28	24.82	28.18	28.89	26.58
M1	70.25	58.25	69.25	75.00	76.50	69.85	22.65	32.34	28.35	28.39	29.19	28.18
Means	73.38	61.38	72.50	78.13	80.63		21.71	31.31	26.58	28.28	29.04	
SE (M)	1.58						0.72					
SE (T)	2.50						1.15					
SE (MT)	3.54						1.62					
CD (M)	3.26						1.49					
CD (T)	5.16						2.36					
CD (MT)	NS						NS					

## DEESA

**Table 929:** Population of aphid/100 compound leaves, white flies/10 fixed plots, hoppers/10 fixed plots, thrips/10 fixed plants, hairy caterpillars recorded and total yield (t/ha)

Treatments	Aphid population/100 compound leaves on 21.12.16						Aphid population/100 compound leaves on 28.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	3.25	2.50	2.25	3.50	2.50	2.80	3.50	2.75	2.50	3.25	3.00	3.00
M1	2.25	2.00	2.75	2.50	3.25	2.55	3.25	2.75	2.25	3.50	3.00	2.95
Means	2.75	2.25	2.50	3.00	2.88		3.38	2.75	2.38	3.38	3.00	
SE (M)	0.46						0.51					
SE (T)	0.72						0.81					
SE (MT)	1.02						1.15					
CD (M)	NS						NS					
CD (T)	NS						NS					
CD (MT)	NS						NS					
	Aphid population/100 compound leaves on 01.03.17						Aphid population/100 compound leaves on 11.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	4.50	2.00	3.00	3.25	2.75	3.10	11.25	5.50	9.75	8.50	7.25	8.45
M1	5.25	1.50	3.25	3.50	2.50	3.20	12.50	6.75	8.75	8.00	8.25	8.85
Means	4.88	1.75	3.13	3.38	2.63		11.88	6.13	9.25	8.25	7.75	
SE (M)	0.43						0.67					
SE (T)	0.68						1.05					
SE (MT)	0.96						1.49					
CD (M)	NS						NS					
CD (T)	1.40						2.17					
CD (MT)	NS						NS					
	Aphid population/100 compound leaves on 20.01.17						Aphid population/100 compound leaves on 27.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	15.00	6.75	10.00	9.50	8.75	10.00	20.25	7.50	12.25	10.25	9.00	11.85
M1	13.25	8.50	11.50	10.00	9.50	10.55	17.25	8.75	13.25	12.25	10.50	12.40
Means	14.13	7.63	10.75	9.75	9.13		18.75	8.13	12.75	11.25	9.75	
SE (M)	0.97						0.92					
SE (T)	1.53						1.46					
SE (MT)	2.17						2.06					
CD (M)	NS						NS					
CD (T)	3.16						3.01					
CD (MT)	NS						NS					
	Aphid population/100 compound leaves on 06.02.17						Aphid population/100 compound leaves on 13.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	46.75	15.75	20.25	20.50	17.75	24.20	84.50	17.00	25.00	22.50	19.50	33.70
M1	44.50	17.00	22.25	21.50	17.50	24.55	87.00	19.00	26.50	24.50	20.50	35.50

Means	45.63	16.38	21.25	21.00	17.63		85.75	18.00	25.75	23.50	20.00	
SE (M)	1.35						1.20					
SE (T)	2.13						1.89					
SE (MT)	3.01						2.68					
CD (M)	NS						NS					
CD (T)	4.39						3.91					
CD (MT)	NS						NS					
	Aphid population/100 compound leaves on 20.02.17						Whiteflies/10 fixed plants on 28.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	129.25	21.75	42.25	34.75	28.50	51.30	1.00	1.00	0.75	1.50	1.50	1.15
M1	116.00	23.75	43.00	32.75	30.75	49.25	1.00	0.75	1.50	0.75	0.75	0.95
Means	122.63	22.75	42.63	33.75	29.63		1.00	0.88	1.13	1.13	1.13	
SE (M)	1.56						0.38					
SE (T)	2.47						0.60					
SE (MT)	3.50						0.85					
CD (M)	NS						NS					
CD (T)	5.10						NS					
CD (MT)	7.21						NS					
	Whiteflies/10 fixed plants on 01.03.17						Whiteflies/10 fixed plants on 11.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	7.00	1.75	4.75	3.25	2.75	3.90	8.00	2.25	5.50	4.50	3.25	4.70
M1	5.75	2.75	5.25	3.50	2.50	3.95	6.25	3.00	6.00	5.75	4.75	5.15
Means	6.38	2.25	5.00	3.38	2.63		7.13	2.63	5.75	5.13	4.00	
SE (M)	0.62						0.63					
SE (T)	0.99						1.00					
SE (MT)	1.40						1.41					
CD (M)	NS						NS					
CD (T)	2.04						2.05					
CD (MT)	NS						NS					
	Whiteflies/10 fixed plants on 20.01.17						Whiteflies/10 fixed plants on 27.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	11.75	4.00	7.00	5.75	4.75	6.65	13.75	3.75	7.50	6.00	4.75	7.15
M1	10.25	4.75	7.75	6.75	4.75	6.85	16.00	5.00	8.50	7.00	5.25	8.35
Means	11.00	4.38	7.38	6.25	4.75		14.88	4.38	8.00	6.50	5.00	
SE (M)	0.51						0.69					
SE (T)	0.80						1.08					
SE (MT)	1.13						1.53					
CD (M)	NS						NS					
CD (T)	1.65						2.24					
CD (MT)	NS						NS					
	Whiteflies/10 fixed plants on 06.02.17						Whiteflies/10 fixed plants on 13.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	21.00	8.50	12.75	11.25	9.75	12.65	23.00	8.00	13.25	11.75	8.50	12.90
M1	19.75	8.25	11.75	10.75	9.00	11.90	24.50	8.00	12.50	10.25	9.75	13.00
Means	20.38	8.38	12.25	11.00	9.38		23.75	8.00	12.88	11.00	9.13	
SE (M)	0.66						0.77					
SE (T)	1.05						1.21					
SE (MT)	1.48						1.71					
CD (M)	NS						NS					
CD (T)	2.16						2.50					
CD (MT)	NS						NS					
	Whiteflies/10 fixed plants on 20.02.17						Hoppers/10 fixed plants on 28.12.16					
	T1	3.32	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	28.25	12.00	19.00	16.25	14.50	18.00	0.75	1.00	1.75	1.00	1.25	1.15
M1	27.00	11.00	18.00	16.75	12.50	17.05	1.00	1.75	0.50	1.25	0.75	1.05
Means	27.63	11.50	18.50	16.50	13.50		0.88	1.38	1.13	1.13	1.00	
SE (M)	1.02						0.37					
SE (T)	1.61						0.59					
SE (MT)	2.28						0.83					

CD (M)	NS						NS					
CD (T)	3.32						NS					
CD (MT)	NS						NS					
	Hoppers/10 fixed plants on 03.01.17						Hoppers/10 fixed plants on 11.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	3.00	1.00	2.25	1.75	1.50	1.90	5.50	1.75	6.00	4.75	3.25	4.25
M1	3.50	1.75	3.00	2.25	1.50	2.40	6.00	2.25	4.50	3.75	4.00	4.10
Means	3.25	1.38	2.63	2.00	1.50		5.75	2.00	5.25	4.25	3.63	
SE (M)	0.32						0.49					
SE (T)	0.51						0.77					
SE (MT)	0.72						1.09					
CD (M)	NS						NS					
CD (T)	1.05						1.59					
CD (MT)	NS						NS					
	Hoppers/10 fixed plants on 20.01.17						Hoppers/10 fixed plants on 27.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	7.00	3.00	6.75	5.25	4.75	5.35	7.75	3.25	7.00	5.75	5.25	5.80
M1	6.25	3.25	6.50	5.75	4.75	5.30	8.00	4.00	6.75	6.25	6.00	6.20
Means	6.63	3.13	6.63	5.50	4.75		7.88	3.63	6.88	6.00	5.63	
SE (M)	0.59						0.55					
SE (T)	0.94						0.87					
SE (MT)	1.33						1.23					
CD (M)	NS						NS					
CD (T)	1.94						1.79					
CD (MT)	NS						NS					
	Hoppers/10 fixed plants on 06.02.17						Hoppers/10 fixed plants on 13.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	8.75	3.50	7.25	6.00	6.25	6.35	9.50	4.75	7.75	6.50	6.50	7.00
M1	9.50	4.25	7.75	7.25	6.75	7.10	10.25	5.25	8.75	8.00	7.25	7.90
Means	9.13	3.88	7.50	6.63	6.50		9.88	5.00	8.25	7.25	6.88	
SE (M)	0.74						0.70					
SE (T)	1.16						1.11					
SE (MT)	1.64						1.57					
CD (M)	NS						NS					
CD (T)	2.40						2.29					
CD (MT)	NS						NS					
	Hoppers/10 fixed plants on 20.02.17						Thrips population/10 fixed plants on 28.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	11.75	5.25	9.75	8.00	7.00	8.35	2.50	2.25	1.75	1.00	2.25	1.95
M1	12.75	5.75	10.50	8.75	8.00	9.15	2.00	2.50	3.25	3.25	2.75	2.75
Means	12.25	5.50	10.13	8.38	7.50		2.25	2.38	2.50	2.13	2.50	
SE (M)	0.74						0.71					
SE (T)	1.17						1.12					
SE (MT)	1.66						1.59					
CD (M)	NS						NS					
CD (T)	2.42						NS					
CD (MT)	NS						NS					
	Thrips population/10 fixed plants on 03.01.17						Thrips population/10 fixed plants on 11.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	4.25	2.25	3.75	2.75	2.50	3.10	6.25	3.25	6.00	5.00	4.25	4.95
M1	5.25	2.75	4.75	4.00	3.25	4.00	6.00	3.00	5.00	4.75	3.50	4.45
Means	4.75	2.50	4.25	3.38	2.88		6.13	3.13	5.50	4.88	3.88	
SE (M)	0.47						0.50					
SE (T)	0.75						0.78					
SE (MT)	1.06						1.11					
CD (M)	NS						NS					
CD (T)	1.54						1.62					
CD (MT)	NS						NS					
	Thrips population/10 fixed plants on 20.01.17						Thrips population/10 fixed plants on 27.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means



M0	7.25	4.25	6.50	6.25	5.25	5.90	8.50	4.75	7.00	6.50	4.75	6.30
M1	8.25	4.00	6.50	7.00	5.00	6.15	9.00	5.50	8.25	7.75	6.50	7.40
Means	7.75	4.13	6.50	6.63	5.13		8.75	5.13	7.63	7.13	5.63	
SE (M)	0.64						0.57					
SE (T)	1.01						0.90					
SE (MT)	1.42						1.27					
CD (M)	NS						NS					
CD (T)	2.07						1.86					
CD (MT)	NS						NS					
	Thrips population/10 fixed plants on 06.02.17						Thrips population/10 fixed plants on 13.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	11.25	6.25	9.25	8.50	7.00	8.45	13.00	6.00	10.50	8.75	7.50	9.15
M1	11.75	6.75	10.00	9.00	7.25	8.95	11.25	7.75	10.00	9.25	8.50	9.35
Means	11.50	6.50	9.63	8.75	7.13		12.13	6.88	10.25	9.00	8.00	
SE (M)	0.61						0.64					
SE (T)	0.96						1.00					
SE (MT)	1.36						1.42					
CD (M)	NS						NS					
CD (T)	1.98						2.07					
CD (MT)	NS						NS					
	Thrips population/10 fixed plants on 20.02.17						Total yield (t/ha)					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	16.75	8.50	13.50	12.00	9.75	12.10	29.38	39.49	34.05	34.40	36.86	34.84
M1	15.25	10.00	13.75	12.75	10.50	12.45	36.63	53.59	42.29	50.46	50.64	46.72
Means	16.00	9.25	13.63	12.38	10.13		33.01	46.54	38.17	42.43	43.75	
SE (M)	0.84						0.69					
SE (T)	1.33						1.10					
SE (MT)	1.87						1.55					
CD (M)	NS						1.43					
CD (T)	2.73						2.26					
CD (MT)	NS						3.20					

## HASSAN

**Table 930:** Population of Aphid population/100 compound leaves, white flies/10 fixed plots, hoppers/10 fixed plots, thrips population/ 10 fixed plants recorded and total yield (t/ha)

Treatments	Aphid population/100 compound leaves on 16.08.16						Aphid population/100 compound leaves on 25.08.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	69.00	57.00	62.25	54.75	50.25	58.65	144.00	100.50	117.75	107.25	88.50	111.60
M1	41.25	45.00	48.75	47.25	39.75	44.40	121.50	63.00	97.50	81.00	65.25	85.65
Means	55.13	51.00	55.50	51.00	45.00		132.75	81.75	107.63	94.13	76.88	
SE (M)	3.75						8.28					
SE (T)	5.93						13.10					
SE (MT)	8.38						18.52					
CD (M)	7.73						17.09					
CD (T)	NS						27.01					
CD (MT)	NS						NS					
	Aphid population/100 compound leaves on 02.09.16						Aphid population/100 compound leaves on 09.09.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	180.75	129.75	153.00	144.75	140.25	149.70	192.75	102.75	95.25	87.75	86.25	112.95
M1	179.25	115.50	132.00	109.50	105.75	128.40	174.00	82.50	87.75	83.25	75.75	100.65
Means	180.00	122.63	142.50	127.13	123.00		183.38	92.63	91.50	85.50	81.00	
SE (M)	7.81						5.08					
SE (T)	12.35						8.03					
SE (MT)	17.47						11.36					
CD (M)	16.11						10.48					
CD (T)	25.48						16.56					
CD (MT)	NS						NS					
	Aphid population/100 compound leaves on 16.09.16						Aphid population/100 compound leaves on 23.09.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means

M0	153.00	87.00	72.75	65.25	57.00	87.00	179.50	70.25	67.00	63.75	54.00	86.90
M1	147.00	57.75	67.50	63.00	60.75	79.20	140.00	59.50	56.00	49.25	45.75	70.10
Means	150.00	72.38	70.13	64.13	58.88		159.75	64.88	61.50	56.50	49.88	
SE (M)	5.19						1.61					
SE (T)	8.21						2.55					
SE (MT)	11.61						3.60					
CD (M)	NS						3.32					
CD (T)	16.93						5.25					
CD (MT)	NS						7.43					
	Aphid population/100 compound leaves on 30.09.16						Aphid population/100 compound leaves on 07.10.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	166.25	59.75	56.75	50.75	46.25	75.95	150.25	56.25	52.50	47.00	42.25	69.65
M1	133.00	49.25	50.75	46.25	42.50	64.35	123.00	45.50	41.50	41.25	40.00	58.25
Means	149.63	54.50	53.75	48.50	44.38		136.63	50.88	47.00	44.13	41.13	
SE (M)	1.10						1.08					
SE (T)	1.73						1.71					
SE (MT)	2.45						2.41					
CD (M)	2.26						2.23					
CD (T)	3.57						3.52					
CD (MT)	5.05						4.98					
	Whiteflies/10 fixed plants on 16.08.16						Whiteflies/10 fixed plants on 25.08.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	16.25	17.25	13.00	12.75	14.00	14.65	36.50	28.50	30.00	28.25	26.75	30.00
M1	9.00	11.00	10.00	10.25	12.00	10.45	32.25	26.50	24.25	21.25	19.00	24.65
Means	12.63	14.13	11.50	11.50	13.00		34.38	27.50	27.13	24.75	22.88	
SE (M)	1.10						1.64					
SE (T)	1.74						2.59					
SE (MT)	2.47						3.66					
CD (M)	2.27						3.38					
CD (T)	NS						5.34					
CD (MT)	NS						NS					
	Whiteflies/10 fixed plants on 02.09.16						White flies/10 fixed plots on 09.09.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	46.50	34.00	43.50	40.00	37.50	40.30	44.50	25.50	31.00	27.50	27.00	31.10
M1	38.50	26.00	32.25	29.75	27.25	30.75	42.50	22.00	24.75	25.25	23.75	27.65
Means	42.50	30.00	37.88	34.88	32.38		43.50	23.75	27.88	26.38	25.38	
SE (M)	2.20						1.26					
SE (T)	3.48						1.99					
SE (MT)	4.92						2.81					
CD (M)	4.54						2.59					
CD (T)	7.17						4.10					
CD (MT)	NS						NS					
	White flies/10 fixed plots on 16.09.16						White flies/10 fixed plots on 23.09.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	31.50	16.75	19.50	19.25	18.25	21.05	34.25	17.25	19.00	17.25	15.75	20.70
M1	30.25	13.25	16.25	14.50	13.25	17.50	23.25	15.25	14.50	13.25	10.75	15.40
Means	30.88	15.00	17.88	16.88	15.75		28.75	16.25	16.75	15.25	13.25	
SE (M)	1.26						0.75					
SE (T)	1.99						1.18					
SE (MT)	2.82						1.67					
CD (M)	2.60						1.54					
CD (T)	4.11						2.44					
CD (MT)	NS						3.44					
	White flies/10 fixed plots on 30.09.16						White flies/10 fixed plots on 07.10.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	29.00	16.00	17.00	15.25	13.25	18.10	25.25	14.75	15.75	12.50	11.50	15.95
M1	21.25	12.25	9.25	9.50	9.75	12.40	17.75	10.00	9.50	7.75	8.50	10.70
Means	25.13	14.13	13.13	12.38	11.50		21.50	12.38	12.63	10.13	10.00	
SE (M)	0.63						0.54					
SE (T)	0.99						0.85					
SE (MT)	1.40						1.20					
CD (M)	1.30						1.10					
CD (T)	2.05						1.75					
CD (MT)	NS						NS					

	Hoppers/10 fixed plants on 16.08.16						Hoppers/10 fixed plants on 25.08.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	26.00	27.00	24.75	25.00	28.25	26.20	46.75	32.25	41.50	44.75	34.75	40.00
M1	23.75	19.25	23.25	21.25	22.00	21.90	34.00	28.00	33.75	30.00	28.25	30.80
Means	24.88	23.13	24.00	23.13	25.13		40.38	30.13	37.63	37.38	31.50	
SE (M)	1.69						3.27					
SE (T)	2.67						5.18					
SE (MT)	3.77						7.32					
CD (M)	3.48						6.75					
CD (T)	NS						NS					
CD (MT)	NS						NS					
	Hoppers/10 fixed plants on 02.09.16						Hoppers/10 fixed plants on 09.09.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	55.25	39.25	45.75	43.00	40.50	44.75	47.25	32.00	35.75	33.00	28.25	35.25
M1	47.25	31.50	42.00	36.75	33.50	38.20	44.25	26.75	31.75	28.25	25.00	31.20
Means	51.25	35.38	43.88	39.88	37.00		45.75	29.38	33.75	30.63	26.63	
SE (M)	2.23						1.78					
SE (T)	3.53						2.82					
SE (MT)	4.99						3.98					
CD (M)	4.60						3.68					
CD (T)	7.28						5.81					
CD (MT)	NS						NS					
	Hoppers/10 fixed plants on 16.09.16						Hoppers/10 fixed plants on 23.09.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	30.50	19.50	23.25	22.00	18.25	22.70	27.50	19.25	20.50	16.50	13.75	19.50
M1	28.75	15.75	21.25	20.50	16.50	20.55	26.50	17.00	19.25	15.00	12.50	18.05
Means	29.63	17.63	22.25	21.25	17.38		27.00	18.13	19.88	15.75	13.13	
SE (M)	1.56						0.80					
SE (T)	2.47						1.26					
SE (MT)	3.49						1.78					
CD (M)	NS						NS					
CD (T)	5.10						2.60					
CD (MT)	NS						NS					
	Hoppers/10 fixed plants on 30.09.16						Hoppers/10 fixed plants on 07.10.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	24.25	16.50	19.75	13.25	10.50	16.85	21.50	15.50	20.00	13.50	10.00	16.10
M1	24.50	13.50	18.25	13.50	9.50	15.85	20.75	16.75	19.25	15.50	9.75	16.40
Means	24.38	15.00	19.00	13.38	10.00		21.13	16.13	19.63	14.50	9.88	
SE (M)	0.51						0.59					
SE (T)	0.81						0.94					
SE (MT)	1.14						1.33					
CD (M)	NS						NS					
CD (T)	1.66						1.93					
CD (MT)	NS						NS					
	Thrips population/10 fixed plants on 16.08.16						Thrips population/10 fixed plants on 25.08.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	30.75	28.25	25.25	24.00	27.50	27.15	50.75	40.50	47.00	38.75	35.00	42.40
M1	28.50	27.25	26.50	27.25	25.50	27.00	39.00	27.75	33.25	28.75	31.25	32.00
Means	29.63	27.75	25.88	25.63	26.50		44.88	34.13	40.13	33.75	33.13	
SE (M)	2.13						2.33					
SE (T)	3.37						3.69					
SE (MT)	4.76						5.22					
CD (M)	NS						4.81					
CD (T)	NS						7.61					
CD (MT)	NS						NS					
	Thrips population/10 fixed plants on 02.09.16						Thrips population/10 fixed plants on 09.09.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	52.50	40.00	45.00	44.50	38.00	44.00	47.75	31.00	37.50	33.50	32.75	36.50
M1	46.00	36.50	42.25	38.00	38.75	40.30	46.25	28.25	31.50	30.25	26.25	32.50
Means	49.25	38.25	43.63	41.25	38.38		47.00	29.63	34.50	31.88	29.50	
SE (M)	2.65						1.80					
SE (T)	4.20						2.85					
SE (MT)	5.94						4.02					
CD (M)	NS						3.71					

CD (T)	NS						5.87					
CD (MT)	NS						NS					
	Thrips population/10 fixed plants on 16.09.16						Thrips population/10 fixed plants on 23.09.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	34.00	22.50	26.50	23.75	20.50	25.45	28.25	20.25	19.00	18.00	19.75	21.05
M1	31.50	20.50	23.25	21.50	13.75	22.10	29.75	19.75	17.50	17.00	13.50	19.50
Means	32.75	21.50	24.88	22.63	17.13		29.00	20.00	18.25	17.50	16.63	
SE (M)	1.45						0.61					
SE (T)	2.30						0.97					
SE (MT)	3.25						1.37					
CD (M)	3.00						1.27					
CD (T)	4.74						2.00					
CD (MT)	NS						2.83					
	Thrips population/10 fixed plants on 30.09.16						Thrips population/10 fixed plants on 07.10.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	24.25	19.00	19.25	14.25	13.50	18.05	20.25	15.50	18.50	13.50	9.75	15.50
M1	23.75	17.00	16.75	14.50	12.50	16.90	20.50	15.50	16.75	11.50	9.75	14.80
Means	24.00	18.00	18.00	14.38	13.00		20.38	15.50	17.63	12.50	9.75	
SE (M)	0.59						0.45					
SE (T)	0.94						0.71					
SE (MT)	1.32						1.01					
CD (M)	NS						NS					
CD (T)	1.93						1.47					
CD (MT)	NS						NS					
	Total Yield (t/ha)											
	T1	T2	T3	T4	T5	Means						
M0	9.60	13.80	12.23	13.01	14.33	12.59						
M1	11.35	15.05	14.35	14.89	16.20	14.37						
Means	10.48	14.43	13.29	13.95	15.26							
SE (M)	0.80											
SE (T)	1.26											
SE (MT)	1.79											
CD (M)	1.65											
CD (T)	2.60											
CD (MT)	NS											

## KALYANI

**Table 931:** Population of aphid/100 compound leaves, white flies/10 fixed plots, epilachna beetle/10 fixed plots recorded at different interval and total yield (t/ha)

Treatments	Aphid population/100 compound leaves on 03.01.17						Aphid population/100 compound leaves on 10.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	1.75	1.25	1.00	2.00	1.50	1.50	4.25	0.00	4.00	2.75	2.25	2.65
M1	1.50	1.25	1.00	1.00	1.25	1.20	4.00	0.00	4.00	2.00	1.75	2.35
Means	1.63	1.25	1.00	1.50	1.38		4.13	0.00	4.00	2.38	2.00	
SE (M)	0.43						0.31					
SE (T)	0.69						0.49					
SE (MT)	0.97						0.69					
CD (M)	NS						NS					
CD (T)	NS						1.00					
CD (MT)	NS						NS					
	Aphid population/100 compound leaves on 17.01.17						Aphid population/100 compound leaves on 24.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	15.50	2.25	14.75	15.00	10.75	11.65	29.25	0.00	26.50	10.50	7.75	14.80
M1	14.75	4.75	13.50	13.25	9.50	11.15	27.25	0.00	25.50	10.50	7.50	14.15
Means	15.13	3.50	14.13	14.13	10.13		28.25	0.00	26.00	10.50	7.63	
SE (M)	0.90						0.86					
SE (T)	1.42						1.36					
SE (MT)	2.01						1.93					

CD (M)	NS						NS					
CD (T)	2.93						2.81					
CD (MT)	NS						NS					
	Aphid population/100 compound leaves on 31.01.17						Aphid population/100 compound leaves on 07.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	65.00	0.00	60.75	23.75	17.25	33.35	91.00	1.75	79.50	19.75	12.75	40.95
M1	56.75	0.00	53.75	20.00	12.25	28.55	81.75	1.75	65.50	16.75	8.50	34.85
Means	60.88	0.00	57.25	21.88	14.75		86.38	1.75	72.50	18.25	10.63	
SE (M)	1.35						1.15					
SE (T)	2.14						1.82					
SE (MT)	3.02						2.58					
CD (M)	2.79						2.38					
CD (T)	4.41						3.76					
CD (MT)	NS						5.32					
	Aphid population/100 compound leaves on 14.02.17						Aphid population/100 compound leaves on 21.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	83.75	2.50	79.00	16.00	10.00	38.25	59.50	2.00	56.50	11.25	5.50	26.95
M1	78.75	2.00	63.00	13.50	6.25	32.70	56.25	0.00	48.50	7.00	4.50	23.25
Means	81.25	2.25	71.00	14.75	8.13		57.88	1.00	52.50	9.13	5.00	
SE (M)	1.42						1.54					
SE (T)	2.25						2.44					
SE (MT)	3.18						3.45					
CD (M)	2.93						3.19					
CD (T)	4.64						5.04					
CD (MT)	6.56						NS					
	Aphid population/100 compound leaves on 28.02.17						Whiteflies/10 fixed plants on 03.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	22.50	0.75	16.75	8.25	1.00	9.85	1.75	1.25	1.75	0.75	2.00	1.50
M1	13.00	0.75	13.00	2.75	1.25	6.15	1.75	1.25	2.50	1.00	0.00	1.30
Means	17.75	0.75	14.88	5.50	1.13		1.75	1.25	2.13	0.88	1.00	
SE (M)	1.00						0.35					
SE (T)	1.58						0.55					
SE (MT)	2.24						0.78					
CD (M)	2.06						NS					
CD (T)	3.26						NS					
CD (MT)	4.61						NS					
	Whiteflies/10 fixed plants on 31.01.17						White flies/10 fixed plots on 07.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	1.25	1.00	2.00	2.25	1.00	1.50	13.50	5.75	15.00	7.75	2.50	8.90
M1	2.00	1.25	2.00	1.25	0.75	1.45	10.00	4.50	9.00	4.75	1.25	5.90
Means	1.63	1.13	2.00	1.75	0.88		11.75	5.13	12.00	6.25	1.88	
SE (M)	0.31						0.68					
SE (T)	0.49						1.08					
SE (MT)	0.69						1.52					
CD (M)	NS						1.41					
CD (T)	NS						2.22					
CD (MT)	NS						NS					
	White flies/10 fixed plots on 14.02.17						White flies/10 fixed plots on 21.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	27.75	6.50	20.75	9.75	4.00	13.75	9.25	2.00	5.25	1.50	1.00	3.80
M1	26.75	3.25	17.00	9.75	3.00	11.95	7.00	1.25	4.50	2.75	2.00	3.50
Means	27.25	4.88	18.88	9.75	3.50		8.13	1.63	4.88	2.13	1.50	
SE (M)	0.94						0.59					
SE (T)	1.49						0.93					
SE (MT)	2.10						1.32					
CD (M)	NS						NS					
CD (T)	3.07						1.92					
CD (MT)	NS						NS					

	White flies/10 fixed plots on 28.02.17						Epilachna Beetle/10 fixed plants on 03.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	2.00	0.75	1.25	1.00	0.50	1.10	1.50	1.00	1.00	1.00	1.25	1.15
M1	1.00	0.50	1.25	0.75	0.25	0.75	1.75	1.50	1.50	1.25	1.50	1.50
Means	1.50	0.63	1.25	0.88	0.38		1.63	1.25	1.25	1.13	1.38	
SE (M)	0.45						0.37					
SE (T)	0.72						0.59					
SE (MT)	1.01						0.83					
CD (M)	NS						NS					
CD (T)	NS						NS					
CD (MT)	NS						NS					
	Epilachna Beetle/10 fixed plants on 10.01.17						Epilachna Beetle/10 fixed plants on 17.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	4.50	2.50	3.50	1.75	1.00	2.65	11.00	9.50	10.50	5.25	5.00	8.25
M1	4.00	2.00	3.25	1.25	1.00	2.30	10.25	9.25	8.75	3.75	4.00	7.20
Means	4.25	2.25	3.38	1.50	1.00		10.63	9.38	9.63	4.50	4.50	
SE (M)	0.27						0.53					
SE (T)	0.42						0.84					
SE (MT)	0.59						1.19					
CD (M)	NS						NS					
CD (T)	0.87						1.74					
CD (MT)	NS						NS					
	Epilachna Beetle/10 fixed plants on 24.01.17						Epilachna beetle/10 fixed plots on 31.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	22.50	12.75	13.00	7.00	5.75	12.20	34.00	15.75	29.00	10.25	8.50	19.50
M1	25.25	12.75	12.50	5.25	3.50	11.85	30.50	16.25	26.00	8.50	7.00	17.65
Means	23.88	12.75	12.75	6.13	4.63		32.25	16.00	27.50	9.38	7.75	
SE (M)	0.73						1.06					
SE (T)	1.16						1.67					
SE (MT)	1.64						2.37					
CD (M)	NS						NS					
CD (T)	2.38						3.45					
CD (MT)	NS						NS					
	Epilachna beetle/10 fixed plots on 07.02.17						Epilachna beetle/10 fixed plots on 14.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	46.00	28.25	38.50	8.75	7.75	25.85	89.50	61.00	51.75	15.75	13.00	46.20
M1	46.75	30.50	36.00	6.00	4.25	24.70	82.75	59.50	48.50	18.75	16.75	45.25
Means	46.38	29.38	37.25	7.38	6.00		86.13	60.25	50.13	17.25	14.88	
SE (M)	0.72						1.39					
SE (T)	1.13						2.20					
SE (MT)	1.60						3.11					
CD (M)	NS						NS					
CD (T)	2.34						4.53					
CD (MT)	NS						NS					
	Epilachna beetle/10 fixed plots on 21.02.17						Epilachna beetle/10 fixed plots on 28.02.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	100.50	88.50	66.75	30.25	20.75	61.35	108.50	92.75	77.00	35.75	23.00	67.40
M1	105.00	68.75	67.25	28.00	22.50	58.30	107.00	60.75	69.00	26.00	24.00	57.35
Means	102.75	78.63	67.00	29.13	21.63		107.75	76.75	73.00	30.88	23.50	
SE (M)	2.35						2.11					
SE (T)	3.71						3.34					
SE (MT)	5.25						4.72					
CD (M)	NS						4.35					
CD (T)	7.65						6.88					
CD (MT)	10.82						9.73					
	Total Yield (t/ha)											
	T1	T2	T3	T4	T5	Means						
M0	14.83	19.72	18.50	24.75	28.64	21.29						
M1	12.94	18.89	18.80	27.92	29.81	21.67						
Means	13.89	19.30	18.65	26.33	29.22							

SE (M)	0.57	
SE (T)	0.90	
SE (MT)	1.27	
CD (M)	NS	
CD (T)	1.85	
CD (MT)	NS	

## MODIPURAM

**Table 932:** Population of aphid/100 compound leaves, white flies/10 fixed plots, hoppers population/10 fixed plants, thrips/10 fixed plants recorded at different interval and total yield (t/ha)

Treatments	<i>Aphis gossypii</i> /100 compound leaves on 28.12.16						<i>Aphis gossypii</i> /100 compound leaves on 06.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	5.00	0.00	2.75	2.50	0.75	2.20	4.00	0.00	2.75	3.50	6.50	3.35
M1	2.00	0.75	1.75	5.50	1.75	2.35	6.25	0.00	2.00	4.50	4.50	3.45
Means	3.50	0.38	2.25	4.00	1.25		5.13	0.00	2.38	4.00	5.50	
SE (M)	1.04						0.79					
SE (T)	1.65						1.25					
SE (MT)	2.33						1.77					
CD (M)	NS						NS					
CD (T)	NS						2.58					
CD (MT)	NS						NS					
Treatments	Whiteflies/10 fixed plants on 24.11.16						Whiteflies/10 fixed plants on 05.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	3.75	3.50	4.25	1.00	2.00	2.90	6.75	8.75	6.25	10.25	6.25	7.65
M1	1.25	3.75	0.75	1.25	2.50	1.90	9.25	3.75	4.25	4.75	4.00	5.20
Means	2.50	3.63	2.50	1.13	2.25		8.00	6.25	5.25	7.50	5.13	
SE (M)	0.67						0.88					
SE (T)	1.05						1.40					
SE (MT)	1.49						1.97					
CD (M)	NS						1.82					
CD (T)	NS						NS					
CD (MT)	NS						NS					
Treatments	Whiteflies/10 fixed plants on 16.12.16						Whiteflies/10 fixed plants on 28.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	3.75	2.25	1.50	2.75	1.25	2.30	2.50	0.25	4.50	4.25	2.50	2.80
M1	3.00	2.25	4.25	2.25	2.25	2.80	2.00	0.25	6.50	5.25	3.50	3.50
Means	3.38	2.25	2.88	2.50	1.75		2.25	0.25	5.50	4.75	3.00	
SE (M)	0.96						1.03					
SE (T)	1.52						1.63					
SE (MT)	2.15						2.30					
CD (M)	NS						NS					
CD (T)	NS						3.35					
CD (MT)	NS						NS					
Treatments	Whiteflies/10 fixed plants on 06.01.17						<i>Myzus persicae</i> /100 compound leaves on 28.12.16					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	0.25	0.00	0.00	0.50	0.00	0.15	0.50	0.00	0.75	0.50	1.25	0.60
M1	0.75	0.00	0.00	0.25	0.00	0.20	0.50	0.00	1.25	0.50	0.00	0.45
Means	0.50	0.00	0.00	0.38	0.00		0.50	0.00	1.00	0.50	0.63	
SE (M)	0.13						0.41					
SE (T)	0.21						0.64					
SE (MT)	0.30						0.91					
CD (M)	NS						NS					
CD (T)	NS						NS					
CD (MT)	NS						NS					
Treatments	<i>Myzus persicae</i> /100 compound leaves on 12.01.17						<i>Myzus persicae</i> /100 compound leaves on 19.01.17					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	2.00	0.25	1.75	1.50	0.50	1.20	5.00	1.25	3.00	3.00	3.50	3.15

M1	1.50	0.00	1.50	1.75	0.25	1.00	4.00	0.75	5.50	4.50	1.75	3.30
Means	1.75	0.13	1.63	1.63	0.38		4.50	1.00	4.25	3.75	2.63	
SE (M)	0.49						1.11					
SE (T)	0.77						1.76					
SE (MT)	1.09						2.49					
CD (M)	NS						NS					
CD (T)	NS						NS					
CD (MT)	NS						NS					
	<i>Myzus persicae</i> /100 compound leaves on 23.01.17						Total yield (t/ha)					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	13.25	11.25	17.25	29.50	25.25	19.30	21.74	25.35	20.39	24.97	22.95	23.08
M1	14.50	4.75	7.00	4.25	2.50	6.60	28.93	28.09	27.12	26.95	27.37	27.69
Means	13.88	8.00	12.13	16.88	13.88		25.33	26.72	23.75	25.96	25.16	
SE (M)	3.21						0.49					
SE (T)	5.07						0.77					
SE (MT)	7.17						1.09					
CD (M)	6.62						1.01					
CD (T)	NS						1.59					
CD (MT)	NS						2.25					

## PATNA

**Table 933:** Population of aphid/100 compound leaves and white flies/10 fixed plots

Treatments	Aphid population/100 compound leaves						Whiteflies population/10 fixed plants					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	511.55	19.60	28.85	16.85	15.30	118.43	9.40	4.93	4.85	4.90	4.10	5.64
M1	436.98	18.05	25.78	15.10	13.63	101.91	7.83	4.08	4.85	3.20	2.98	4.59
Means	474.26	18.83	27.31	15.98	14.46		8.61	4.50	4.85	4.05	3.54	
SE (M)	4.79						0.26					
SE (T)	7.58						0.41					
SE (MT)	10.72						0.58					
CD (M)	9.89						0.53					
CD (T)	15.63						0.84					
CD (MT)	22.11						NS					

## PUNE

**Table 934:** Population of aphid/100 compound leaves, white flies/10 fixed plots, hoppers/10 fixed plots and total yield (t/ha)

Treatments	Aphid/100 compound leaves						Whiteflies/10 fixed plants					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	347.00	144.25	273.00	270.00	264.50	259.75	39.75	6.25	28.25	25.75	26.25	25.25
M1	238.50	69.75	208.00	191.25	203.75	182.25	36.25	4.25	27.25	28.25	25.50	24.30
Means	292.75	107.00	240.50	230.63	234.13		38.00	5.25	27.75	27.00	25.88	
SE (M)	13.24						1.34					
SE (T)	20.93						2.12					
SE (MT)	29.61						2.99					
CD (M)	27.31						NS					
CD (T)	43.18						4.37					
CD (MT)	NS						NS					
Treatments	Hoppers/10 fixed plants						Total yield (t/ha)					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	33.50	9.00	25.75	18.00	18.50	20.95	16.64	24.74	20.28	25.07	20.49	21.44
M1	28.75	6.75	22.75	18.25	17.00	18.70	20.56	29.74	23.82	26.53	23.82	24.90
Means	31.13	7.88	24.25	18.13	17.75		18.60	27.24	22.05	25.80	22.15	
SE (M)	0.84						1.34					
SE (T)	1.33						2.13					



SE (MT)	1.89	3.01
CD (M)	1.74	2.77
CD (T)	2.75	4.38
CD (MT)	NS	NS

## RAIPUR

**Table 935:** Population of aphid/100 compound leaves, white flies/10 fixed plots, hoppers/10 fixed plots, thrips/10 fixed plants recorded and total yield (t/ha)

Treatments	Aphid population/100 compound leaves						Whiteflies population/10 fixed plants					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	142.39	35.74	88.74	67.46	48.29	76.52	165.42	54.18	99.98	84.93	73.94	95.69
M1	117.76	22.69	69.25	54.45	37.73	60.37	143.92	45.24	91.70	79.04	59.37	83.85
Means	130.07	29.21	78.99	60.96	43.01		154.67	49.71	95.84	81.98	66.65	
SE (M)	1.12						0.56					
SE (T)	1.77						0.88					
SE (MT)	2.50						1.25					
CD (M)	2.37						1.18					
CD (T)	3.74						1.87					
CD (MT)	5.29						2.64					
Treatments	Hoppers population/10 fixed plants						Thrips Population /10 Fixed plants					
	T1	T2	T3	T4	T5	Means	T1	T2	T3	T4	T5	Means
M0	71.26	24.32	49.87	37.91	29.84	42.64	87.39	23.63	69.77	62.30	49.93	58.61
M1	57.96	17.20	40.25	29.01	20.72	33.03	67.96	18.14	66.89	41.30	33.97	45.65
Means	64.61	20.76	45.06	33.46	25.28		77.68	20.89	68.33	51.80	41.95	
SE (M)	0.25						0.55					
SE (T)	0.39						0.86					
SE (MT)	0.55						1.22					
CD (M)	0.52						1.16					
CD (T)	0.83						1.83					
CD (MT)	1.17						2.59					
Treatments	Total yield (Kg/plot)											
	T1	T2	T3	T4	T5	Means						
M0	14.93	14.79	13.61	15.21	12.57	14.22						
M1	19.44	19.37	17.85	18.96	17.64	18.65						
Means	17.19	17.08	15.73	17.08	15.10							
SE (M)	1.12											
SE (T)	1.77											
SE (MT)	2.50											
CD (M)	2.37											
CD (T)	NS											
CD (MT)	NS											

## ENT. 4: MANAGEMENT OF POTATO TUBER MOTH USING BIOLOGICAL CONTROL AGENTS IN STORES

**Table 936:** Experimental details

Centre	HSN
Year	2016-17
Replication	4
Spacing	60x20
Plot size (gross m <sup>2</sup> )	7.20
Planting date	06.06.16
Harvesting date	06.08.16
Variety	K Jyoti

### Treatments

- T1 : Untreated control  
T2 : Dip treatment of tubers with neem oil @1%  
T3 : Dip treatment of tubers with neem oil @2%  
T4 : Dip treatment of tubers with Bt formulation @1%  
T5 : Dip treatment of tubers with Bt formulation @2%  
T6 : Dip treatment of tubers with CSR bio formulation

### HASSAN

**Table 937:** Tubers damaged due to PTM larvae

Treatment	Tubers damaged due to PTM larvae in			
	1 <sup>st</sup> month	2 <sup>nd</sup> month	3 <sup>rd</sup> month	4 <sup>th</sup> month
T1	33.95	48.90	58.91	91.16
T2	14.72	34.94	45.29	79.87
T3	12.20	28.67	34.56	71.82
T4	10.16	19.28	28.30	57.20
T5	9.00	18.69	24.88	40.51
T6	13.81	35.76	44.16	59.64
SEd	1.52	1.92	3.12	2.72
CD(0.05)	3.20	4.02	6.55	5.70
CV%	15.41	9.76	12.52	6.44

## **AICRP (POTATO) PUBLICATIONS, EXTENSION ACTIVITIES, TRAININGS ETC. DURING 2016-17**

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### **(A) RESEARCH PAPERS**

#### **DEESA**

1. Chongtham SK, RN Patel, IM Patel, JK Patel and DM Zapadiya 2016. Effect of different fertility levels on tuber yields, input use efficiency and economics of potato variety Kufri Chipsona-3. *International Journal of Agriculture Sciences* **8**(49): 2066-2068.
2. Chongtham SK, CK Patel, RN Patel, JK Patel, JM Patel, DM Zapadiya, DH Patel and CR Patel 2016. Growth, yield, economics, water and nutrient use efficiency of potato as influenced by different methods of drip fertigation and varieties. *International Journal of Agriculture Sciences* **8**(38): 1787-1790.
3. Prajapati Asha, CK Patel, N Singh, SK Jain, SK Chongtham, MN Maheshwari, CR Patel and RN Patel 2016. Evaluation of Seaweed Extract on Growth and Yield of Potato. *Environment & Ecology*. **34** (2): 605-608.

#### **DHOLI**

1. Dwivedi DK, LM Yadav and RS Singh 2017. Effect of nitrogen and potassium on potato + maize intercropping. *Gyan manthan* **5**:132.
2. Kumar Shantanu, DK Dwivedi, Ravikant Kumar and Nitish Kumar 2017. Effect of Nitrogen and Potash on Potato (*Solanum-tuberosum*) under Indo Gangetic Plain Zone of Bihar. *Environment & Ecology* **35** (1):55-57.

#### **FAIZABAD**

1. Maurya N, SP Pathak and Santosh Kumar 2016. Biological control of rhizoctonia stems canker and black scurf of potato. *J. Environment and Life Sciences* **9**(3): 347-349.
2. Maurya N, SP Pathak, D Kumar and YK Bharti 2016. Effects of temperature and pH on sclerotial germination of *Rhizoctonia solani* Kuhn inciting stem canker and black scurf in potato. *J. Environment and Life Sciences* **9**(6): 734-735.
3. Maharshi Pratap and PK Singh 2017. Effect of Integrated Nutrient Management on growth and quality of potato (*Solanum tuberosum* L.) cv Kufri Ashoka . *J. Environment and Life Sciences* (Accepted).

#### **HISAR**

1. Ghiyal Vikram, AK Bhatia and Deva Shri Maan 2016. Efficient use of water and fertilizer through drip fertigation in Potato (*Solanum tuberosum* L.) Cv. Kufri Bahar in Haryana. *Biosciences and Biotechnology Research in Asia* **13**(4): 2025-2030.
2. Ghiyal Vikram, AK Bhatia and VK Batra 2017. Studies on nitrogen application frequency on the yield of drip irrigated potato (*Solanum tuberosum* L.) Cv. Kufri Bahar. *International Journal of Pure and Applied Bioscience*. **5** (1): 484-488.
3. Ghiyal Vikram, AK Bhatia and VK Batra 2017. Nutrient uptake and tuber yield influenced by nitrogen levels and fertigation frequency in potato (*Solanum tuberosum* L) *Indian Journal of Ecology* **44**:269-271.

#### **JORHAT**

1. Chutia Roji, PC Bhagawati and DJ Nath 2017. Effect of bio-fertilizers and integrated nutrient management on yield of potato and soil microbial activity. An abstract of paper presentation held at Indian Institute of Technology, Guwahati, Assam 16-19<sup>th</sup> March, 2017.
2. Sarkar L, PC Bhagawati, PK Gogoi, BK Medhi and SN Phukan 2017. Effect of organic manures and bio-fertilizers on growth and yield of Potato (*Solanum tuberosum* L.). *Journal of Environment and Ecology* (Accepted)

## KALYANI

1. Das SK, H Banerjee, K Jana, A Sarkar and A Chakraborty 2017. Assessment of site - specific primary nutrient element requirements for potato (*Solanum tuberosum* L.) under lower Gangetic plains of West Bengal. *Indian Agriculturist* **60**(1&2): 71-74.
2. Banerjee H, AM Puste, K Ray, S Sarkar, A Chakraborty and L Rana 2016. Influence of irrigation levels and mulching on growth, water use, yield, economics and quality of potato (*Solanum tuberosum* L.) under new alluvial soil of West Bengal. *Indian J. Agronomy* **61**(3): 377-383.
3. Murmu S, S Dey and A Chakraborty 2017. Efficacy of different fungicides for management of early blight disease of Potato. *Journal of Applied and Natural Science* **9**(1): 280-285.
4. Chakraborty A and H Banerjee 2016. Effective management strategies against late blight of potato. *SAARC J. Agri.* **14**(1): 111-117.
5. Murmu S, S Dey and A Chakraborty 2016. Studies on intercropping on management of early blight of potato. *J. Mycopathol. Res.* **54**(1): 155-157.
6. Dey S and A Chakraborty 2016. Influence of agronomic practices on severity of late blight (*Phytophthora infestans*) of potato. *Journal of Applied and Natural Science* **8**(3): 1302-1305.

## PUNE

1. More SA, MR Deshmukh and MM Katkar 2016. Efficacy of sequential sprays of different fungicides against early blight *Alternaria solani* (Ellis and Martin) in potato *Solanum tuberosum* L. *International Journal of Environment, Agriculture and Biotechnology* **1**(3): 19-22.
2. More SA, MM Katkar and SS Bhosale 2016. Efficacy of Selected Acaricides against two-Spotted Red Mite, *Tetranychus urticae* Koch (Acari: Tetranychidae). *Advances in Life Sciences* **5**(16): 6371-6374.
3. More SA 2016. Efficacy of newer insecticides against aphids and jassids on potato. *International Journal of Multidisciplinary Studies.* **2**(2):1-5.

## SRINAGAR

1. Ganie MA, S Narayan, FA Khan, SH Khan and SA Bhat 2016. Effect of spacing and organic manures on plant growth and tuber yield of potato under Kashmir conditions. *Green Farming* **7**(1): 127-132.
2. Faheema S, FN Bhat, SH Khan, MD Shah, JI Chishti, A Nabi, S Mufti and B Afroza 2017. Studies on effect of calcium on improving yield and post harvest qualities of potato variety Shalimar potato-I. *Annals of Biology* **33**(1): 120-122.
3. Faheema S, SH Khan, FN Bhat, MD Shah, A Nabi and JI Chishti 2017. Effect of different Nitrogen levels on Potato yield and Agronomic N use efficiency under temperate conditions. *Annals of Biology* (Accepted).

## (B) TECHNICAL /EXTENSION BULLETIN

### BHUBANESHWAR

1. Mishra A, P N Jagdev, D Ghosal, A K Mohanty, P C Satpathy, G Biswal and A Sasmal 2017. Odisha Baigyanika paddhatire bihana aloo utpadana pranali (Odia) (Scientific Technology for seed potato production in Odisha). Directorate of Extension Education, Odisha University of Agriculture & Technology, Bhubaneswar.
2. Mishra A, P N Jagdev, D Ghosal, A K Mohanty, P C Satpathy, G Biswal and A Sasmal 2017. Seed potato production technology for Odisha. (English). Directorate of Extension Education, Odisha University of Agriculture & Technology, Bhubaneswar.

### DEESA

1. Patel RN, JK Patel, SK Chongtham, DM Zapadia and PM Patel 2016. *Batatani Vaigyanik Kheti Padhyati*. Sheni No. **3:4**:186.

## HASSAN

1. Prasad P S, Vishnuvardhana and Soumya Shetty 2016. Potato late blight disease management (in Kannada).
2. Vishnuvardhana, H Amarnanjundeswara, PS Prasad, and Soumya Shetty 2016. Recommended improved potato varieties for Karnataka state (in Kannada).

## (C) POPULAR ARTICLES/OTHER PUBLICATIONS/TECHNICAL BULLETINS/BOOK CHAPTER AND EXTENSION MATERIAL

### BHUBANESHWAR

1. Mishra A 2016. Alu utpadana badhaiba jaruri (Urgent need for increasing potato production). The Samaja (27.04.2016)
2. Mishra A 2017. Aloo Mission ra pratibandhaka (Obstacles of Potato Mission). The Samaja (02.03.2017)

### DEESA

1. Chongtham SK, RN Patel, JK Patel and DM Zapadiya 2016. "Batatani kheti vishayak mavajato". Batatana pakmau sankalit pak vyavastha, Gujarat Bagayat Vikas- July- 66: 1-3.
2. Patel RN, JK Patel, SK Chongtham and DM Zapadiya 2016. "Batatani judijudi jato" Batatana pakmau sankalit pak vyavastha, Gujarat Bagayat Vikas- July- 66: 4-6.
3. Patel JK, RN Patel, SK Chongtham and DM Zapadiya 2016. "Batata Ma Bij Utpadan" Batatana pakmau sankalit pak vyavastha, Gujarat Bagayat Vikas- July- 66: 7-11.
4. Patel JK, VH Kanbi, RN Patel, SK Chongtham and DM Zapadiya 2016. "Batatapak aadhareet udhyogo : prashno, ukel ane bhavi" Batatana pakmau sankalit pak vyavastha, Gujarat Bagayat Vikas- July- 66: 45-50.

### GWALIOR

1. Singh SP, MJ Sadawarti, S Roy and SK Chakraborty 2016. "Potato" In: Production technology of rabi crops (eds SS Tomar, YD Mishra and SS Kushwah) Published by Biotech Books 4762=63/23, Ansari Road, Daryaganj, New Delhi=110002.

### HISAR

1. Singh H, VPS Panghal and AK Bhatia 2016. Aaluon Ka Surakshit Bhandaran. Haryana Kheti, **49**(12): 11 & 25
2. Singh H, VPS Panghal and DS, Duhan 2016. Kisano Ki Pahli Pasand: Aaloo ki kheti. Haryana Kheti **49**(10): 22-23.

### JORHAT

1. Bhagawan Bharali , Bhupendra Haloi , Zafar Ullah , Jayashree Chutia, Sonbeer Chack 2016. Phytotoxicity of Oxidized and Reduced Nitrogen Aerosols on Potato (*Solanum tuberosum* L.) crop. In: sustainable potato production and the impact on climate change. IGI Global Information Science Reference, Chocolate Avenue, Hershey PAI 7033, USA.

### KOTA

1. Jat Laxman and Banwari Lal Nagar 2017. Cultivation of flowers (Rose, Marigold, Chrysanthemum, Gladiolus, Tuberose, Dahaila, Gallardia, PHM of flowers). In: *Udanki Fasalon Ki Kheti* (Eds Devendra Kumar Singh, S K Trivedi and Banwari Lal Nagar) Himanshu Publication Udaipur.

## PASIGHAT

1. Debnath P and P Sarma 2017. Role of Bio-fertilizers in Integrated Nutrient Management. Compendium of Training Programme on “Soil testing and organic farming for sustainable agriculture management in North East India” organized by Department of NRM, CHF, Pasighat. 75-80.
2. Warade SD, RK Dubey, K Kartek, P Sarma and AK Pandey 2017. Evaluation of Potato varieties suitable for North Eastern Region. Published in the Souvenir of National Seminar on “Emerging Crops of North-East India Suitable for Horticulture based Integrated Farming System” organized by Central Agricultural University, Imphal from February 7-9, 2017.p.373.

## PUNE

1. Deshmukh MR, S A More and MM Katkar 2016. Batata lagawadiche sudharit tantranyan. *Godwa* 5:7
2. More SA, M R Deshmukh, MM Katkar and SB Gurav. 2016. Yashogatha- Nandurbar Jilyatil Batata lagwad. *Krushidoot* .6:7
3. More SA, MR Deshmukh and MM Katkar 2017. Batata kadhani pratavari ani sathavnuk. *Krushidoot* 1:9
4. More SA 2016. Danrat madhye prathamach fulala Batata. *Agrowon* 7:9
5. More S A 2016. Rabi Batata lagwad faydyachi. *Agrowon* 11:11

## (D) PARTICIPATION IN EXTENSION ACTIVITIES

### BHUBANESHWAR

1. Mishra A. imparted training on “Improved agronomic management for higher seed and table potato production” to district level officers (Deputy Director of Horticulture and / or Assistant Director of Horticulture) from 10 districts under Cuttack, Berhampur and Sambalpur zones at respective zonal headquarters on October 28, 29 and 30, respectively in 2016.
2. Mishra A. participated in Farmer-Scientist interaction programme on ‘Improved potato cultivation’ at KVK, Angul, Odisha on December 2, 2016. This programme was attended by 50 farmers.
3. Mishra A. imparted training to farmers on “Farmers’ right on plant varieties” under PPV & FRA Act-2001 in the KVK- adopted villages of G. Udayagiri, Baripada, Gajapati and Rayagada on March 20, 22, 27 and 28, respectively in 2017. Each of these training programmes was attended by over 100 farmers.

### DEESA

1. Patel RN and JK Patel attended State level “Krushimatosav Mega Event” programme at Dantiwada of Banaskantha district organised by SDAU, Dantiwada on May 13-14, 2016 and also exhibited improved potato technologies.
2. Patel RN and JK Patel participated in “Dealers and Farmers meet” organized by Indian Potash Ltd, Ahmedabad at Murlidhar Cold Storage, Deesa on September 10, 2016. This meeting was attended by more than 500 farmers.
3. Patel RN delivered a lecture on “Key points for increasing potato productivity” in Kisan Sangosthi organized by Deepak Fertilizers and Agrochemicals Corporation limited at Maharaja Cold Storage, Dantiwada on September 25, 2016. This event was attended by more than 400 farmers.
4. Patel RN delivered talk on “*parisamvad on sajiv kheti*” in Kisan Sangosthi organized by Rotary Club Palanpur at Juna ganj bazar, Palanpur on October 2, 2016. This Kisan Sangosthi was attended by nearly 700 farmers.
5. Patel RN delivered lecture on “Potato seed production technology” in Kisan Sangosthi organized by Castor- Mustard Research station, Sardarkrushinagar under Mera Gaun Mera Gaurav scheme in *khedut sabha* at Ranpur (U), Deesa on October 6, 2016. This event was attended by more than 200 farmers.
6. Patel RN and JK Patel arranged stall on potato production technology in “Farmers Fair cum Exhibition” organized by ATMA, FTC, Deesa at APMC, Palanpur on February 10, 2017. This meeting was attended by more than 650 farmers.

## FAIZABAD

1. Technologies related to potato production and disease management were disseminated to several visiting farmers.
2. Disseminated technologies related to potato production and disease management in Kisan Mela organized by Department of Agriculture on 23-12-2016.
3. Scientists associated with AICRP (Potato) exhibited potato related technologies in Flower and Vegetable Exhibition at Governor house Lucknow on 25th and 26<sup>th</sup> February 2017.

## HASSAN

1. Vishnuvardhana and PS Prasad conducted potato sample survey in Hassan district during 1<sup>st</sup> to 4<sup>th</sup> April, 2016. Potato sample collection work was carried out at different cold storages of Hassan district for testing seed borne diseases.
2. Vishnuvardhana, PS Prasad and Soumya Shetty, attended "Hoysalotsva-2016" from 2<sup>nd</sup> to 4<sup>th</sup> April, 2016 in Hassan. Exhibition on potato varieties and potato disease specimens were also laid down on this event.
3. Vishnuvardhana participated in a meeting regarding supply of certified potato seed tubers organized by Department of Horticulture, Hassan on 04-04-2016. Discussion on supply of certified seed tubers to farmers of Hassan District was carried out during the meeting.
4. Vishnuvardhana participated in certified potato seed distribution meeting in Lalbagh, Bengaluru on 28-04-2016 organized by Department of Horticulture, Hassan, and discussed about supply of certified potato seed tubers to farmers of Hassan district.
5. Prasad PS participated in Potato seed distribution meeting organized by Department of Horticulture, Hassan on 3<sup>rd</sup> & 4<sup>th</sup> June, 2016. Discussion on soft rot disease outbreak in certified potato seed tubers supplied by Dept. of Horticulture to the farmers of Hassan district were carried out and decision was taken to replace the infected seed tubers.
6. Amarnanjundeswara H, PS Prasad, S Shankar, Soumya Shetty and Sandhya GC " attended Field day on potato-Kharif,2016" organized by AICRP on Potato, HRES, Hassan on 27<sup>th</sup> August, 2016. Exhibited stall on different genotypes of potato were laid down and this field day was attended by more than 100 farmers.
7. Amarnanjundeswara H and PS Prasad participated in Field day to demonstrate performance of potato certified seed tubers of Kufri Jyoti in Kanayakanahalli, Belur(T), Hassan This event was organized by Department of Horticulture, Hassan on 07.09.2016.
8. Amarnanjundeswara H and PS Prasad participated in meeting on potato seed production through aeroponics on 5<sup>th</sup> November, 2016 at MS building, Bangalore organized by Department of Horticulture. Discussion on potato seed production through aeroponics was carried out during the meeting.
9. Amarnanjundeswara H and PS Prasad attended meeting with Principal Secretary, Dept. of Horticulture along with CPRI Scientists regarding production of potato micro tubers through aeroponics on 15 and 16<sup>th</sup> November, 2016 at MS Building, Bangalore.
10. Amarnanjundeswara H, PS Prasad and GC Sandhya participated in "Technology Week" at KVK, Kandli, Hassan on 01/12/2016, delivered the guest lecture on Potato and exhibited potato advanced technologies and varieties.
11. Amarnanjundeswara H and S Shankar participated in "International Soil Health Day in Hassan" organized by KVK, Kandli, Hassan on 05<sup>th</sup> December, 2016 and exhibited different varieties of Potato, charts and potato disease specimens during the function.
12. Amarnanjundeswara H attended meeting regarding potato seed tuber distribution for the coming Kharif season (2017-18) in Hassan district at Lalbagh, Bangalore on 06.12.2016. Meeting was organized by Department of Horticulture, Govt. of Karnataka.
13. Amarnanjundeswara H and PS Prasad attended meeting regarding potato seed tuber distribution on 15<sup>th</sup> Dec, 2016 in presence of district in-charge minister at Hassan. Meeting was organized by Department of Horticulture, Hassan.
14. Amarnanjundeswara H, PS Prasad and GC Sandhya participated in "Totagarika Mela-2016" organized by UHS, Navanagar, Bagalkot from 17<sup>th</sup> to 19<sup>th</sup> December, 2016. Exhibited different varieties of potato, potato charts and live specimen of potato.

15. Amarnanjundeswara H, PS Prasad and S Shankar participated in “Farmer’s day” on 23<sup>rd</sup> December, 2016 at Ramenahally, Holenarsipura taluk, Hassan (D) and delivered the lecture on production technology of potato and other horticulture crops.
16. Amarnanjundeswara H, PS Prasad, S Shankar and GC Sandhya participated in “Regional Horticulture Fair-2017” held at IIHR, Bangalore between 15<sup>th</sup> to 19<sup>th</sup>, January, 2017 and exhibited different varieties of potato (20 Varieties), disease specimens and charts.
17. Amarnanjundeswara H, PS Prasad, S Shankar and GC Sandhya participated in “Flower Show during Republic Day-2017” held at Hassan from 26<sup>th</sup> to 28<sup>th</sup>, January, 2017 and exhibited different varieties of Potato, charts and potato disease specimens during the function.
18. Amarnanjundeswara H and PS Prasad attended seed Potato meeting at Hassan on 15<sup>th</sup> March, 2017 organized by Department of Horticulture, Hassan. Discussion on Potato cultivation and precautionary measures to be taken at Hassan district was carried out during the meeting.

#### **HISAR**

1. Bhatia AK and VPS Panghal attended and guided farmers in Kisan Mela on September 9-10, 2016 organized by Directorate of Extension Education, CCS HAU, Hisar. This Kisan mela was attended by more than 25 thousand farmers.
2. Bhatia AK and VPS Panghal participated and guiding farmers in 1st Haryana Agri Conclave and Expo-2017 organized by CCS HAU, Hisar on March 22-23, 2017.
3. Panghal VPS participated Maharana Pratap Jayanti Celebration Programme and delivered lecture in Udhyan Gosthi at HTI, Uchani, Karnal on May 28, 2017.
4. Bhatia AK and VPS Panghal attended the farmers as and when they visited at the vegetable farm or in the department or contacted on phone.

#### **JALANDHAR**

1. Imparted training on ‘Potato varieties and their suitability for different regions’ on 15<sup>th</sup> December 2016 under a training programme “Farmers’ Training-cum-Workshop on Potato Seed Production” held at CPRS Jalandhar.

#### **KALYANI**

1. Chakraborty A, A Sarkar, SK Das, R Roy and G Biswas attended “Krishi Parbon (Technology Week)” organized by KVK, Gayeshpur, Nadia, B.C.K.V. on 18-20<sup>th</sup> Jan, 2017. This Kisan mela was attended by more than 200 farmers.
2. Chakraborty A, A Sarkar, SK Das, R Roy and G Biswas participated in “Technology week 2017- cum – Pre Rabi Krishak sammelon fair” organized by KVK, Hooghly, B.C.K.V. Chinsurah, West Bengal on 8-10<sup>th</sup> Feb, 2017. This Kisan mela was attended by more than 200 farmers.
3. Chakraborty A, A Sarkar and SK Das acted as resource persons in “Training to Agriculture Officers of Govt. of Odissa on modern techniques of raising potato tuber and seed including pest and disease management” organized by BCKV and Govt. of Odissa on 15.12.2016. This training was attended by more than 35 officers.
4. Chakraborty A, A Sarkar, SK Das, R Roy and G Biswas participated in “Krishi Parbon (Technology Week)” organized by KVK, Gayeshpur, Nadia, B.C.K.V. on 18-20<sup>th</sup> Jan, 2017. This Kisan mela was attended by more than 200 farmers.
5. Chakraborty A, A Sarkar, SK Das, R Roy and G Biswas participated in “Technology week 2017- cum – Pre Rabi Krishak sammelon fair” organized by KVK, Hooghly, B.C.K.V. Chinsurah, West Bengal on 8-10<sup>th</sup> Feb, 2017. This Kisan mela was attended by more than 200 farmers.

#### **KANPUR**

1. Exhibited tubers of released varieties of Potato in “Vegetable Exhibition” organized by Indian Institute of Technology, Kanpur on February 25-26, 2017.



2. Mishra UC and IN Shukla, conducted “Vegetable Exhibition” with potato varieties at Raj Bhavan(Governor House), Lucknow U.P. on February 26-27,2017.

#### **KOTA**

1. Nagar B L participated in Krishi Vigyan Mela organized with agriculture department in collaboration KVK at Borkhera, Kota from 25<sup>th</sup> -27<sup>th</sup> February 2017. Lecture on potato production technology and exhibition on potato varieties and different vegetables and flowers were laid down. This Krishi Vigyan Mela was attended by more than 7500 farmers.
2. Nagar BL participated in Garlic Show in Krishi Vigyan Mela, Anta wherein lecture was delivered on Potato production technology. This event was organized in collaboration with agriculture department and KVK Anta on 04.03.2017. This Krishi Vigyan Mela was attended by more than 2500 farmers.
3. Nagar BL delivered a lecture on Protected cultivation with special reference to potato (TPS) in a training programme organized by State institute of agriculture management on February 01, 2017. This training was attended by more than 50 Progressive farmer.
4. Nagar BL delivered a lecture on Importance of mulching & its application in horticultural crops with special reference to potato production in a training programme organized by State institute of agriculture management on January 31, 2015. Training was attended by more than 50 Progressive farmer.
5. Nagar BL delivered a lecture on Irrigation management in horticultural crops in a training organized by IMTI Kota on February 13, 2017. Training was attended by more than 50 Progressive farmer.

#### **PASIGHAT**

1. Sarma P, SD Warade and AK Pandey participated in “Arunachal Agri Expo 2017” organized by College of Horticulture & Forestry, CAU, Pasighat on January 21-22, 2017. Potato germplasm/ varieties were displayed during the Exhibition organized on the occasion. This Agri Expo was attended by more than 500 farmers.

#### **PUNE**

1. Deshmukh MR and MM Katkar conducted Training programme on “seed treatment to potato tubers” at village Kodit, Dist Pune on November 26,2016. The training programme was attended by 45 farmers.
2. More SA conducted Training programme on “potato production” at Visapur Tal- Khataw Dist.- Satara on April 20,2016. The training programme was attended by 52 farmers.
3. More SA conducted survey of potato pest and diseases at Jawla, Karegaon, Bhiwdi, Pargaon, Peth villages of Pune Distt. on August 12, 2016.
4. More SA, MM Katkar and BA Bade conducted survey on pest and diseases of potato at Taliye, Bichukale, Velu, Koregaon, kinger, Bamnoli, Rajapuri, Ozarde villages of Satara Distt. on September 30,2016.
5. More SA organized a training programme on “potato production” at Rawadw, Tal- Mulashi, Distt- Pune on December 20, 2016.

#### **SRINAGAR**

1. Interaction with students from Govt. Girls Higher Secondary Institute, Kothi Bagh, and Srinagar regarding improved potato cultivation techniques / tissue culture techniques for raising virus free Potato seed was attended by Dr Faheema Mushtaq on 01.04.2016.
2. Dr SH Khan and Dr Faheema Mushtaq participated in Awareness programme and exhibition in a function on *Pradhan Mantri Fasal Bhima Yojana* held at KVK Malangpora on 31.05.2016.
3. Scientist associated with AICRP (Potato) participated in Exhibition cum Seed Mela organised by SKUAST-Kashmir on 11<sup>th</sup> &12<sup>th</sup> March,2017.
4. Dr SH Khan attended a Scientists-Farmers interaction meet organised by SKUAST-Kashmir on 12.03.2017
5. Dr SH Khan and Dr Faheema Mushtaq attended regular interactions with Farmers through ATIC to boost production of Potato in the Kashmir valley.

## **(E) TV/RADIO PROGRAMMES**

### **BHUBANESHWAR**

1. Mishra A participated as an expert in radio talk on 'Aloo chasa pain purba prastuti' (Preparation for potato cultivation) at All India Radio (Kisan Vani Programme), Puri on Oct 9, 2016.
2. Mishra A gave a radio talk on 'Adhika utpadana pain unnata pranalire aloo chasa' (Improved agronomic practices for higher productivity of potato) at All India Radio, Bhubaneswar on Oct 13, 2016.
3. Mishra A participated as an expert in live 'Phone-in' programme on 'Aloo chasa o roga poka parichalana' (Potato cultivation and insect pest & disease management) at Doordarshan Kendra, Bhubaneswar on Nov 8, 2016.
4. Mishra A and D Ghosal participated as an expert on 'Aloo phasalare sara prayoga o' jala parichalana' (Fertilizer and water management in potato) recorded at Research Farm and telecasted by Doordarshan Kendra, Bhubaneswar on Dec 18, 2016.
5. Mishra A participated as an expert on the topic 'Aloo amala O' parabarti jatna' (Potato harvest and after-care) at All India Radio (Kisan Vani Programme), Puri on Feb 6, 2017.
6. Mishra A acted as expert on the topic 'Precautions during and after potato harvest' recorded in the Research Farm of AICRP on Potato and telecasted by Doordarshan Kendra, Bhubaneswar on Feb 27, 2017.

### **CHHINDWARA**

1. DN Nandekar delivered Radio talk on "Potato production technology for MP" at All India Radio station Chhindwara on dated Des, 5<sup>th</sup> 2016.
2. DN Nandekar participated in Radio talk on "Importance of fertilizer and manures increasing the potato production" on dated Nov, 2<sup>0th</sup> 2016.
3. DN Nandekar delivered Radio talk on "Importance of irrigation and storage of potato for obtaining higher potato production" on dated 7<sup>th</sup> Jan, 2017.

### **DEESA**

1. Patel RN participated as an expert on the topic "Batatani Vaigyanik Kheti" at DD Girnar, Gujarat on October 18, 2016.

### **DHOLI**

1. Scientists associated in AICRP(Potato) participated as experts on the topic "Aaloo + Makka ki antarwanti kheti" recorded on 29.12.2016 by E.Tv Bihar.
2. Scientists associated in AICRP(Potato) participated as experts on the topic "Aaloo ki nikauni, mitti chadana, nitrogen uprivesan tatha paudha sanrakshan", recorded on 24.11.2016, D.D Bihar.

### **JORHAT**

1. Saikia MK participated in a radio talk on the topic "Sit kalin pasolir rog niantran vyavastha" at AIR, Jorhat, Assam on Nov 18. 2016.

### **HASSAN**

1. Vishnuvardhana participated in radio talk "Integrated nutrient management of potato" at AIR, Hassan on 25.04.2016.
2. Prasad PS gave a radio talk on the topic "Integrated disease management of potato" at AIR, Hassan on 25.04.2016.
3. Vishnuvardhana delivered a radio talk on the topic "Seed treatment and precautionary measures to be taken up prior to potato planting" at AIR, Hassan on 17.05.2016.
4. Prasad PS gave a radio talk on the topic "Symptoms of late blight disease of potato and their management" at AIR, Hassan on 17.07.2016.

5. Amarananjundeswara H delivered a radio talk "Advanced production technology of potato" at AIR, Hassan on 29.08.2016.
6. Prasad PS gave a radio talk on the topic "Integrated pest and disease management in potato" at AIR, Hassan on 29.08.2016.
7. Shankar S delivered a radio talk "Uses of bio-fertilizers in Potato" at AIR, Hassan on 29.08.2016.

#### **HISAR**

1. Bhatia AK acted as expert on the topic "Sabjion Ka utpadan" Phone in programme broadcasted by All India Radio, Rohtak on August 20, 2016.
2. Bhatia AK participated in "Poly house Me Sabjion Ka utpadan" Phone in programme broadcasted by All India Radio, Hisar on October 12, 2016.
3. Bhatia AK participated in "Alloo Ka utpadan" Phone in programme broadcasted by All India Radio, Hisar on November 28, 2016.
4. Bhatia AK participated in "Sabjion Phaslo Ki Dekhbhal" Phone in programme broadcasted by All India Radio, Hisar on November 20, 2016.
5. Bhatia AK gave a talk "Potato cultivation" Broadcasted by All India Radio, Hisar on September 28, 2017.
6. Panghal VPS participated in Phone in Programme on "Sabji Fasalo Ki Dekhbhal". Radio talk delivered at All India Radio Hisar on 18<sup>th</sup> July 2016.

#### **KANPUR**

1. Yadav AK (SRF) delivered television talk "Alo Bhandaran ki vidhi" at ETV Uttar Pradesh, at Kanpur on 4<sup>th</sup> April 2016.

#### **KALYANI**

1. Chakraborty A gave a radio talk "Paschim Bange aloor Nabi dhasa roger purbabhas" at Akash Bani (AIR-A) Kolkata on January 6, 2017.

#### **KOTA**

1. Nagar B L delivered a radio talk "Alu Ki Kheti" at AIR. Kota on Sept. 05, 2016

#### **PUNE**

1. MM Katkar delivered a radio talk " Batatyavaril kid v roganche ekatmik niyantran" at Akasshwani Pune , Maharashtra on October 5, 2016.
2. MR Deshmukh gave a radio talk "Rabi hangamatil Batata lagwad" at Akashwani Pune, Maharashtra on September 7, 2016.

#### **SRINAGAR**

1. Khan SH acted as expert on the topic "Pre & Post harvest techniques for improved shelf life of Potato" at Doordarshan Kendra, Srinagar, Kashmir on April 17, 2016.
2. Mushtaq F acted as expert on the topic "Planting of Potato on Scientific lines" at Doordarshan Kendra, Srinagar, and Kashmir on May 08, 2016.
3. Khan SH acted as expert on the topic "Storage of potato on scientific lines" at Doordarshan Kendra, Srinagar, Kashmir on May 25, 2016.
4. Mushtaq F participated in a programme "Production Technology of Potato Crop" at Doordarshan Kendra, Srinagar, Kashmir on June 14, 2016.
5. Mushtaq F acted as an expert in a programme "Vermi-compost and its use in Potato Production" at Doordarshan Kendra, Srinagar, Kashmir on June 27, 2016.

## **(F) TRAINING/WORKSHOP/SEMINAR ORGANISED/ATTENDED**

### **BHUBANESHWAR**

1. State Level Research Council Meeting of OUAT, Bhubaneswar from June 4-6, 2016 was attended by A Mishra and D Ghosal.
2. Second Meeting of the State Level Steering Committee of State Potato Mission under the Chairmanship of Addl. Chief Secretary, Govt. of Odisha held in the Secretariate, Odisha on July 20, 2016 was attended by A Mishra
3. 34<sup>th</sup> Group Meeting of AICRP on Potato held at CPRI, Shimla from August 20-22, 2016 was attended by AK Mishra and D Ghosal.
4. National Seminar on 'Climate-smart Agriculture with special reference to potato' held at CPRI, Shimla on August 23, 2016 was attended by A Mishra and D Ghosal.
5. Workshop on "Roadmap for potato seed production in Odisha" held in the Conference Hall of IMAGE, Bhubaneswar on January 17, 2017 was attended by A Mishra.
6. Workshop on "Challenges and opportunities of expanding the role of potato in increasing household income and food security in the state of Odisha" organized by International Potato Centre (CIP) held in Hotel Excellency, Ashok Nagar, Bhubaneswar on January 28, 2017 was attended by A Mishra.
7. Workshop on "Awareness generation on Intellectual Property Rights" held in the Biju Patnaik Hall, OUAT, Bhubaneswar on January 30, 2017 was attended by A Mishra and D Ghosal.
8. Third Steering Committee Meeting of Potato Mission held in the Secretariat, Govt. of Odisha (under the Chairmanship of the Chief Secretary of Odisha) on February 25, 2017 was attended by A Mishra.

### **DEESA**

1. RN Patel attended Expert Elicitation Workshop on "Tracking Potato Improved Cultivars Adaptation in Gujarat" held at Hotel Pride Ahmedabad on June 7, 2016 and delivered lecture on "Present Situation of potato in Gujarat".
2. 34<sup>th</sup> Annual group meeting of AICRP (Potato) held at CPRI, Shimla from August 20-22, 2016 was attended by Dr RN Patel, SK Chongtham and JK Patel
3. Brain Storming Session on "Climate Smart Agriculture with Special reference to Potato" held at CPRI, Shimla on August 23, 2016 was attended by RN Patel, Dr SK Chongtham and JK Patel.
4. Winter school training on "Designing and Analysis of Cropping System Experiments" organized during September 07-27, 2016 at I.C.A.R-Indian Agricultural Statistics Research Institute, Library Avenue, New Delh was attended by SK Chongtham.
5. The Fourth International Agronomy Congress on "Agronomy for Sustainable Management of Natural Resources, Environment, Energy and Livelihood Security to Achieve Zero Hunger Challenge", held at ICAR-IARI, Pusa Campus, New Delhi, India during November 22-26, 2016 was participated by SK Chongtham.
6. Workshop on "Forward Thinking for Research and Innovation in Agri-Food Chain" held at SDAU, Sardarkrushinagar during December 28-29, 2016 was attended by SK Chongtham and RN Patel.
7. Workshop on "Forward Thinking for Research and Innovation in Agri-Food Chain" held at SDAU, Sardarkrushinagar during January 6-7, 2017 was attended by JK Patel.

### **DHOLI**

1. Yadav LM delivered lecture on the topic "current status of potato improvement in Bihar" on 28-01-2017 in orientation programme of Dr. RPCAU, Pusa
2. Yadav LM participated in a workshop "collaborative study on varietal release and adoption of potato varieties in India" organized by CIP & CPRI, Shimla at Patna on 10<sup>th</sup> June, 2016.
3. Yadav LM participated in State Horticulture Fair "Sangam" as one of the expert held at Hajipur on 9<sup>th</sup> & 10<sup>th</sup> July, 2016.
4. 34<sup>th</sup> Annual group meeting of AICRP (Potato) held at CPRI, Shimla from August 20-22, 2016 was attended by LM Yadav, DK Dwivedi and Birender Kumar.
5. Yadav LM participated in the Bihar potato conclave held at BAMETI, Patna organized by ICC & Bameti from 15<sup>th</sup> to 16<sup>th</sup> September, 2016.

6. Dwivedi DK participated as an expert on the topic “*Khadya suraksah me aaloo ka asthan*” organized by Deptt. of Agri. Bihar at Saidpur, Distt. Samastipur.
7. Dwivedi DK participated as an expert on the topic “*Bahu Phasal me aaloo ka asthan*” organized by Deptt. of Agri. Bihar, Tajpur, Distt. Samastipur.
8. Dwivedi DK participated in a programme “*Aaloo aadharit labhprad phasal pranali*” organized by Deptt. of Agriculture, Vaini, Pusa, Distt. Samastipur.

#### **FAIZABAD**

1. Singh AP and RK Srivastava attended 34<sup>th</sup> Group meeting of AICRP-Potato scientists held at ICAR-CPRI Shimla during August 20-22 2016.

#### **HASSAN**

1. Bi-monthly workshop held at Arakalgudu organized by Department of Horticulture, Hassan on 12<sup>th</sup> April, 2016 was attended by Vishnuvardhana and Prasad PS and potato production technology was discussed.
2. Expert Elicitation Workshop on Tracking Potato Improved Cultivars Adoption in Karnataka held at Hassan on 19<sup>th</sup> June, 2016 was attended by Vishnuvardhana and Prasad PS and details of present situation of potato in Karnataka was presented.
3. Prasad PS, S Shankar, Soumya Shetty and G C Sandhya organized one day training Programme in collaboration with ETC at AICRP on Potato, HRES, Hassan on 29<sup>th</sup> July, 2016 and delivered lectures on potato production technology and diseases/pests management. The training programme was attended by more than 50 farmers of Hassan and Chikkamagalur district.
4. Amarnanjundeswara H participated as resource person in training programme on knowledge and adoption of recommended practices and technical skill empowerment of potato growers in Hassan district held at Rangapura, Arakalgudu organized by COA, Hassan, UAS, Bangalore on 10<sup>th</sup> August, 2016.
5. 34<sup>th</sup> group meeting of AICRP on potato and national seminar on climate smart agriculture with special reference to potato held at CPRI, Shimla from 20<sup>th</sup> to 23<sup>rd</sup> August, 2016 was attended by H Amarnanjundeswara and Prasad P.
6. Amarnanjundeswara H and PS Prasad participated as resource person in training programme on organic farming practices in vegetable crops at Sanenahally, Hassan (T& Distt.) on 31<sup>st</sup> January, 2017 and delivered guest lecture on organic farming practices in potato.
7. Amarnanjundeswara H and PS Prasad participated as resource person in training programme on organic cultivation of vegetables and potato at Nanjedevarakoppalu, Hassan (T & Distt.) on 07<sup>th</sup> February, 2017 and delivered guest lecture on organic cultivation of vegetables and potato.
8. Amarnanjundeswara H, PS Prasad and GC Sandhya along with CIP scientists organized one day training programme on production technology of potato to the potato growing farmers of Hassan district at AICRP on potato, HRES, Hassan on 17<sup>th</sup> February, 2017.
9. Bi-monthly workshop held at Hassan organized by Department of Horticulture, Hassan on 1<sup>st</sup> March, 2017 was attended by H Amarnanjundeswara and Prasad PS and discussed potato production technology.
10. Amarnanjundeswara H and GC Sandhya participated in annual technical meeting-2017 held at UHS, Bagalkot from 2<sup>nd</sup> to 4<sup>th</sup> March, 2017 and presented yearly progress report-2016-17 of AICRP crop improvement and crop production trials.
11. PS Prasad participated in annual technical meeting-2017 held at COH, Koppal from 6<sup>th</sup> to 8<sup>th</sup> March, 2017 and presented yearly progress report-2016-17 of crop protection trials.

#### **HISAR**

1. 34<sup>th</sup> Group Meeting of Potato workers held at CPRI, Shimla from August 20-22, 2016 was attended by AK Bhatia, Gupta and VPS Panghal.
2. Brain storming session on “Climate Smart Agriculture with special reference to Potato” held on August 23, 2016 at ICAR- Central Potato Research Institute, Shimla was attended by AK Bhatia and VPS Panghal.
3. Capacity Building Workshop on IPR Instruments organized by Directorate of Research on May 6, 2017 at CCS HAU, Hisar was attended by VPS Panghal.

## **JALANDHAR**

1. 34<sup>th</sup> Group Meeting of Potato workers held at ICAR-CPRI Shimla from August 20-22, 2016 was attended by Raj Kumar and Prince.
2. 'Potato Stakeholders Meeting' held at ICAR-CPRS Jalandhar on December 31, 2016 was attended by Raj Kumar.
3. Expert elicitation Workshop on "Tracking Potato Improved Cultivars Adoption in Punjab" organized by International Potato Centre (CIP) on May 17, 2016 in Hotel Ramada, Jalandhar was attended by Raj Kumar.

## **JORHAT**

1. 34<sup>th</sup> Group Meeting of Potato workers held at CPRI, Shimla from August 20-22, 2016 was attended by PC Bhagawati, Md Z Ullah and MK Saikia.
2. Seminar on "Climate Smart Agriculture" with potato held at CPRI, Shimla on August 23, 2016 was attended by PC Bhagawati, Md Z Ullah and MK Saikia.

## **KALYANI**

1. 34<sup>th</sup> Group Meeting of Potato workers held at ICAR-CPRI, Shimla from August 20-22, 2016 was attended by A Chakraborty, A Sarkar and SK Das.
2. Brain storming session on Climate smart agriculture with special reference to potato held at ICAR-CPRI, Shimla from 23<sup>rd</sup> August, 2016 was attended by A Chakraborty, A Sarkar and SK Das.
3. National Seminar on Food Security and Sustainable Nutrition in India: The Present Scenario held at APC College, New Barrackpore, West Bengal from September 15-16, 2016 was attended by SK Das.
4. National Symposium on Agriculture and Food Production, Today and Tomorrow held at Institute of Agricultural Science, University of Calcutta, West Bengal from February 22- 24, 2017 was attended by SK Das.
5. National Seminar on Nutrients and pollutants in soil-plant-animal-human continuum for sustaining soil, food and nutritional security - way forward held at FACC, BCKV West Bengal from June 9-10, 2017 was attended by SK Das and A Chakraborty

## **KOTA**

1. 34<sup>th</sup> group meeting of Potato workers held at ICAR-Central Potato Research Institute from August 20-22, 2016 was attended by B L Nagar.
2. Brain storming session on climate smart Agriculture with special reference to Potato held at ICAR-CPRI, Shimla on 23.08.2016 was attended by B L Nagar.
3. BL Nagar attended 21days winter school on "Protected cultivation of commercial flowers and vegetables" from 5-25 Jan., 2017 at UHS, Bagalkot, Karnataka.

## **PASIGHAT**

1. 34<sup>th</sup> Group Meeting of Potato workers held at ICAR-Central Potato Research Institute, Shimla, Himachal Pradesh from August 20-22, 2016 was attended by SD Warade.
2. National Seminar on "Emerging Crops of North-East India Suitable for Horticulture based Integrated Farming System" organized by Central Agricultural University, Imphal, Manipur held from 7-9 February, 2017 and was attended by SD Warade.

## **PATNA**

1. SK Yadav attended 4<sup>th</sup> International Agronomy Congress, during November 22-26, 2016 at IARI, New Delhi.

## **PUNE**

1. 34<sup>th</sup> Group meeting of potato workers held at CPRI, Shimla from August 20-22, 2016 was attended by MR Deshmukh and SA More

## **SRINAGAR**

1. 34<sup>th</sup> Group Meeting of Potato workers held at CPRI, Shimla from August 20-22, 2016 was attended by SH Khan and Faheema Mushtaq.
2. One-day Seminar on 'Climate Smart Agriculture with reference to Potato at CPRI; Shimla on 20<sup>th</sup> August-2016 was attended by SHKhan and Faheema Mushtaq.

## **(G) PAPER PRESENTED IN CONFERENCE/SYMPOSIA/SEMINARS/OTHER FORUM**

### **BHUBESHWAR**

1. Ghosal D, A Mishra, AK Mohanty, PC Satpathy and A Sasmal 2017. Effect of weed management practices on the performance of heat tolerant Potato cv. Kufri Surya in the coastal zone of Odisha. In: National Seminar on "Water Resources Management in the context of climate change for growing India" held at Orissa University of Agriculture & Technology, Bhubaneswar from 27 February to 1 March, 2017.

### **DEESA**

1. Chongtham SK presented a paper on "Nitrogen Requirement of Potato Variety Kufri Surya" in Fourth International Agronomy Congress on "Agronomy for Sustainable Management of Natural Resources, Environment, Energy and Livelihood Security to Achieve Zero Hunger Challenge", held at ICAR-IARI, Pusa Campus, New Delhi, India during November 22–26, 2016.

### **HISAR**

1. Maan Deva Shri, AK Bhatia, Ansul and Vikram Ghiyal 2017. Comparison of furrow and drip irrigation methods on marketable yield of potato crop. Abstract in Conference on Human Health and Nutrition - 2017 held at Shoolini University, Solan (HP) pp-109
2. Ghiyal Vikram, AK Bhatia and VK Batra 2017. Effect of fertigation frequency and nitrogen levels on the growth parameters of potato (*Solanum tuberosum* L.) Cv. Kufri Bahar. Abstract in International Conference on Sustainable Natural Resources Management: from Science to Practice (SNRMSP-2017) pp-45.
3. Ghiyal Vikram, AK Bhatia and VK Batra 2017. Influence of nitrogen application frequency on yield and economics of drip irrigated potato (*Solanum tuberosum* L.) Cv. Kufri Bahar. Abstract in 104<sup>th</sup> Indian Science Congress, Tirupati, pp-243.
4. Ghiyal Vikram, AK Bhatia and VK Batra 2017. Studies on nitrogen application frequency on the yield of drip irrigated potato (*Solanum tuberosum* L.) Cv. Kufri Bahar. Abstract in International Conference on Emerging Areas of Environmental Science and Engineering (EAESE, 2017) pp-218.
5. Maan Deva Shri, AK Bhatia and Mandeep Rathi 2017. Correlation studies on association of morphological and biochemical traits for potato apical leaf-curl disease resistance or susceptibility. Abstract in International Conference on Sustainable Natural Resources Management: from Science to Practice (SNRMSP-2017) pp-175.
6. Bhatia AK and VPS Panghal presented the recommendations for inclusion in package of practice in the Horticulture Officers Workshop–2017 organized by DEE, Maharana Partap Horticulture University and CCS Haryana Agricultural University on May 18, 2017 at CSSRI, Karnal.
7. Panghal VPS presented poster in XIV National Seed Seminar on "Food Security Through Augmented Seed Supply Under Climate Uncertainties" held from January 28-30, 2017 at IARI, New Delhi.
8. Ghiyal Vikram student of Dr. A.K. Bhatia secured first position in oral presentation on "Effect of fertigation frequency and nitrogen levels on the growth and yield of potato (*Solanum tuberosum*) CV. Kufri Bahar" in the International Conference on "Sustainable Natural Resource Management: From Science to practice (SNRMSP-2017)" held at Banaras Hindu University, Varanasi during 12-13th January, 2017.

### **KALYANI**

1. Chakraborty A presented paper on "Studies on effect..... potato early blight" in National Seminar on Challenges towards plant health under changing climate scenario for sustainable agriculture at FACC, BCKV, West Bengal during 24-26, November, 2016.

2. Chakraborty A presented a paper on “Healthy potato seed production in West Bengal- an over view” in National Symposium on Plant health management for food security and safety at FACC, BCKV, West Bengal during 8-9th, December, 2016.
3. Das SK presented a paper on “Responses of newly released potato (*Solanum tuberosum* L.) Cultivars to different nitrogen levels under lower Gangetic plains of WEST BENGAL” in International Symposium on “Eco-Efficiency in Agriculture and Allied Research at FACC, BCKV, West Bengal during 20 – 23<sup>rd</sup> January, 2017.
4. Das SK presented a paper on “Assessment of site - specific primary nutrient element requirements for potato (*Solanum tuberosum* L.) under lower Gangetic plains of West Bengal” in National Symposium on Agriculture and Food Production, Today and Tomorrow at Institute of Agricultural Science, University of Calcutta during 22<sup>nd</sup> - 24<sup>th</sup> February, 2017.
5. Das SK and A Chakraborty presented a paper on “Effect of boron and zinc on growth and yield of potato (*Solanum tuberosum* L.) under lower Gangetic plains of West Bengal” in National Seminar on Nutrients and pollutants in soil-plant-animal-human continuum for sustaining soil, food and nutritional security - way forward at FACC, BCKV, West Bengal during June 9-10, 2017.

#### KANPUR

1. 34<sup>th</sup> Group Meeting of Potato held at Central Potato Research Institute, Shimla on August 20-22, 2016 attended by Shri U. C. Mishra and Dr. Ramesh Singh.

#### PATNA

1. Yadav SK, PM Govindakrishanan, VK Dua and TK Bag. 2016. Effect of weed management practices on potato in NEH region of India. 4th International Agronomy Congress held at IARI, New Delhi, India during 22-26 November, 2016 (1):430-431.

#### (H) STUDENT GUIDED DURING 2016-17

Name of the centre	Name of the student	Title of thesis	Degree
Bhubaneswar	Miss Monalisa Jena (Plant Breeding & Genetics)	Genetic diversity among heat tolerant Potato genotypes for morpho-physiological traits	M.Sc
	Miss Gayatri Mohapatra (Vegetable Science)	Study on response of potato to different levels of irrigation	M.Sc
	Miss Subhashree Hota (Microbiology)	Microbial Population dynamics of rhizospheric soil under potato cultivation	M.Sc
Dholi	Pankaj Kumar	Effect of NPK on growth and yield of potato ( <i>Solanum tuberosum</i> L.)	M.Sc
Faizabad		Effect of irrigation methods, moisture regimes and nitrogen management in potato crop ( <i>Solanum tuberosum</i> L.) cv Kufri Badshah.	M.Sc (Ag)
		Effect of Integrated Nutrient Management on growth yield and quality of potato ( <i>Solanum tuberosum</i> L.) cv Kufri Ashoka.	Ph.D
GWALIOR	Mr. Dharmender Gaur	Optimization of Phosphorus requirement in potato ( <i>Solanum tuberosum</i> ) through organic and inorganic sources under current scenario of P use by farmers. Guided by Dr S P Singh. PS, ICAR-CPRS, Gwalior, MP during 2016 Student from RVSKVV, Gwalior, MP	M.Sc



<b>Hassan</b>	Mr. Manjunath Rama Poojari	Studies on development of specific micronutrient formulation for growth, yield and quality in potato ( <i>Solanum tuberosum</i> . L)	M.Sc
<b>HISAR</b>	Mr. Udayvir	Effect of crop residue incorporation, organic manures and bio- fertilizer on potato production	M.Sc
	Mr. Ziauddin	Effect of foliar application of micronutrients on potato production.	M.Sc
	Ms. Renu Yadav	Response of nitrogen levels on potato varieties.	M.Sc
	Ms. Devashri Mann	Effect of irrigation methods and different nitrogen levels on growth and yield of potato.	Ph.D
	Mr. Mohamad Taha	Effect of Nitrogen Source on Production and shelf life of potato.	
<b>Jorhat</b>	Ms. Roji Chutia	Intregated nutrient management in Potato grown loy TPS tuberlet and its residual effect on summer greengram	M.Sc
	Ms. Lupamudra Singha	Genetic variability studies in Potato	M.Sc
	Ms. Roji Chutia	Integrated nutrient management in Potato-baby corn sequence and its residual effect on kharif sesamum	Ph.D
<b>Kalyani</b>	Dibakar Panda	Management of early blight of Potato by using non convenient chemicals	M.Sc
	Biswajit Lenka	Effect of Boron and Zinc application on growth and productivity of Potato	M.Sc
	Barun Gopal Mondal	Effect of spacing, dates of haulm cutting and fertility levels on seed grade tuber yield of Potato	M.Sc
<b>PASIGHAT</b>	Ms. Mumtak Miyu*	Effect of micronutrients on growth, yield and quality of potato ( <i>Solanum tuberosum</i> L.)	M.Sc
<b>SRINAGAR</b>	Mr. Muzamil Ahmad Hajam	Genetic variability and divergence studies in Potato ( <i>Solanium tuberossu</i> m L.).Major Advisor: Dr.S.H.Khan	M.Sc

## FINANCIAL STATEMENT FOR THE YEAR 2016-17

(Rs in lakhs)

Name of Centre	Head wise RE allocation (ICAR 75% share)						
	Pay & allowances	TA	Recurring Contingency		TSP	Works & equipment	Total
			Research	Operational			
Bhubaneshwar	22.40	0.40	2.20	0.00	0.00	0.00	25.00
Chhindwara*	23.40	0.20	1.40	0.00	5.00	0.00	30.00
Deesa	12.70	0.30	2.00	0.00	0.00	0.00	15.00
Dharwad	17.80	0.20	2.00	0.00	0.00	0.00	20.00
Dholi	34.70	0.30	2.00	0.00	0.00	0.00	37.00
Faizabad	26.70	0.30	2.00	0.00	0.00	0.00	29.00
Hassan	22.60	0.40	2.00	0.00	0.00	0.00	25.00
Hisar	32.70	0.30	2.00	0.00	0.00	0.00	35.00
Jorhat	57.20	0.80	2.00	0.00	0.00	0.00	60.00
Kalyani	29.30	0.50	2.20	0.00	0.00	0.00	32.00
Kanpur	11.40	0.30	2.00	6.30	0.00	0.00	20.00
Kota	21.80	0.20	2.00	0.00	0.00	0.00	24.00
Pantnagar	20.50	0.50	2.00	0.00	0.00	0.00	23.00
Passighat**	0.10	0.50	2.00	8.40	0.00	0.00	11.00
Pune	11.40	0.30	2.00	6.30	0.00	0.00	20.00
Raipur	27.70	0.30	2.00	0.00	10.00	0.00	40.00
Srinagar	41.60	0.40	2.00	0.00	0.00	0.00	44.00
<b>Total</b>	<b>414.00</b>	<b>6.20</b>	<b>33.80</b>	<b>21.00</b>	<b>15.00</b>	<b>0.00</b>	<b>490.00</b>

\* The RE allocation for Chhindwara under TSP may be used for AICRP field trials as well as demonstration, training and other activities.

\*\* 100 % ICAR Share

<b>Plan BE 2016-17 (ICAR Share)</b>	<b>:</b>	<b>Rs 616.00 Lakhs</b>
<b>Plan RE 2016-17 (ICAR Share)</b>	<b>:</b>	<b>Rs 490.00 Lakhs</b>

**LIST OF SCIENTISTS ASSOCIATED WITH AICRP (POTATO) AS ON 31.03.2017**

Name	Designation	Discipline
<b>PROJECT HEADQUARTER (CPRI, SHIMLA)</b>		
Dr SK Chakrabarti	Director	Pathology
Dr Raja Shankar	Sr Scientist	Vegetable Science
<b>CENTRAL POTATO RESEARCH INSTITUTE BASED CENTERS</b>		
<b>Central Potato Research Institute, Shimla-171 001 (HP)</b>		
Dr VK Dua*	Head, Division of Crop Production	Agronomy
Dr Vinay Bhardwaj*	Actg. Head, Div. of Crop Improvement	Genetics and Cytogenesis
Dr Sanjeev Sharma*	Actg. Head, Division of Crop Protection	Plant Pathology
<b>Central Potato Research Institute Regional Station, Modipuram campus-250 110 (Uttar Pradesh)</b>		
Dr Manoj Kumar	Joint Director	Soil Science
Dr (Mrs.) Kamlesh Malik	Principal Scientist	Entomology
Dr Sanjay Rawal	Principal Scientist	Agronomy
Dr VK Gupta	Principal Scientist	Plant Breeding
Dr SK Luthra	Principal Scientist	Plant Breeding
Dr Name Singh	Principal Scientist	Agronomy
<b>Central Potato Research Station, Post Box No.4, Morar, Gwalior- 474 006 (Madhya Pradesh)</b>		
Dr Satyajit Roy	PS & Head	Plant Pathology
Dr SP Singh	Principal Scientist	Agronomy
Dr Murlidhar Sadawarti	Scientist (SS)	Seed Technology
<b>Central Potato Research Station, PO Model Town, PB No.1,Jalandhar 143 001 (Punjab)</b>		
Dr JS Minhas	PS & Head	Plant Breeding
Dr Raj Kumar	Principal Scientist	Plant Breeding
Dr Prince	Scientist	Vegetable Science
<b>Central Potato Research Station, PO Sahaynagar, Patna-801 506 (Bihar)</b>		
Dr Shambhu Kumar	PS & Actg.Head	Plant Breeding
Dr RK Singh	Sr Scientist	Seed Technology
Sh Rahul R Bakade	Scientist	Plant Pathology
<b>Central Potato Research Station, Shillong-793 009 (Meghalaya)</b>		
Dr Clarissa Challam	Scientist	Bio technology
Dr Bappi Das	Scientist	Vegetable Science
<b>Central Potato Research Station, PO Muthorai-643 004 (Tamil Nadu)</b>		
Dr EP Venkatsalam	Acting Head & Sr Scientist	Seed Technology
Dr R Sudha	Scientist	Horticulture
Dr Divya K Laxmanan	Scientist	Vegetable Science
Dr Priyank Mahatre	Scientist	Nematology
<b>Central Potato Research Station, Kufri, Shimla-171 012 (HP)</b>		
Dr Vinod Kumar	Principal Scientist & Actg. Head	Plant Breeding
<b>SAU BASED CENTERS</b>		
<b>AICRP on Potato, Research Wing, Orissa University of Agriculture &amp; Technology, Administrative Building, Bhubaneshwar-751 003 (Odisha)</b>		
Dr AK Mishra	Potato Breeder	Plant Breeding
Mr Debasis Ghosal	Jr. Agronomist	Agronomy
<b>Regional Agricultural Research Station, Jawaharlal Nehru Krishi Vishwavidyalya Chandangaon, Chhindwara-480 001 (Madhya Pradesh)</b>		
Dr DN Nandekar	Senior Scientist	Agronomy
<b>Potato Research Station, Sardar Krushinagar Dantiwada Agricultural University, Deesa-385 535, Banaskantha (Gujarat)</b>		
Dr RN Patel	Research Scientist	Plant Breeding
Dr Sunil Kumar Chongtham	Assistant Research Scientist	Agronomy
Sh JK Patel	Assistant Research Scientist	Plant Pathology
<b>AICRP on Potato, Division of Horticulture, University of Agricultural Sciences, Dharwad-580 005 (Karnataka)</b>		
Dr PR Dharmatti	Professor	Horticulture

Dr Kushal	Assistant Professor	Horticulture
<b>Department of Horticulture, Trihut College of Agriculture, Rajendra Agricultural University Campus, Dholi-843 121, District Muzaffarpur (Bihar)</b>		
Dr Lal Mani Yadav	Chief Scientist	Horticulture
Dr Birendra Kumar	Senior Scientist	Plant Pathology
Dr DK Diwedi	Senior Scientist	Agronomy
Mrs Pramila	Jr. Horticulturist	Horticulture
<b>Division of Vegetable Crops, ND University of Agricultural &amp; Technology, Narenda Nagar, PO Kumarganj, Faizabad-224 229 (Uttar Pradesh)</b>		
Dr AP Singh	Technical Assistant	Production
Dr Srivastava	Technical Assistant	Breeding
<b>Horticulture Research Station, Somanhalli Kaval, Kudregundi post, Hassan-573219 (Karnataka)</b>		
Dr H Amarananjundeswara	Assistant Professor	Horticulture
Dr PS Prasad	Assistant Professor	Plant Pathology
<b>Department of Vegetable Sciences, CCS Haryana Agricultural University, Hisar-125 004 (Haryana)</b>		
Dr AK Bhatia	Principal Scientist	Plant Breeding
Dr Anil Gupta	Sr. Scientist	Plant Pathology
Dr VPS Panghal	Sr. Scientist	Agronomy
<b>Department of Agronomy, Assam Agricultural University, Jorhat-785 013 (Assam)</b>		
Dr Promod C Bhagawati	Principal Scientist	Agronomy
Dr Md Zafar Ullah	Principal Scientist	Plant Breeding
Dr Mitul Kumar Saikia	Senior Scientist	Plant Pathology
<b>Research Complex Building, BC Krishi Vishwavidyalaya, Kalyani-741 235 (Nadia) West Bengal</b>		
Dr Ashis Chakraborty	Associate Professor	Plant Pathology
Dr Arnab Sarkar	Assistant Professor	Agronomy
Dr Sanjib Kumar Das	Assistant Professor	Breeding
<b>Department of Vegetable Science, CSA University of Agriculture &amp; Technology, Kanpur- 208021 (UP)</b>		
Dr Ramesh Singh	Jr. Virologist	Plant Pathology
Dr UC Mishra	Jr. Agronomist	Agronomy
<b>Agriculture University Kota, Umedganj Farm, PB No. 7, GPO Nayapura, Kaithoon Road, Kota-324 001 (Rajasthan)</b>		
Dr BL Nagar	Assistant Professor	Horticulture
<b>Division of Vegetable Sciences, GB Pant University of Agriculture &amp; Technology, Udham Singh Nagar, Pantnagar-263 145 (Uttarakhand)</b>		
Dr Manoj Raghav	Professor	Agronomy
Dr RP Singh	Professor	Plant Pathology
Dr Dhirender Singh	Professor	Plant Breeding
<b>College of Horticulture &amp; Forestry, Central Agricultural University, Pasighat-791102 (Arunachal Pradesh)</b>		
Dr Pranabjyoti Sarma	Associate Professor	Vegetable Science
<b>AICRP on Potato, National Agricultural Research Project, MPKV Rahuri, Ganeshkhind, Pune-411007 (Maharashtra)</b>		
Dr MR Deshmukh	Assistant Professor	Horticulture
Dr SA More	Assistant Professor	Entomology
<b>Division of Plant Breeding and Genetics, GE Road, IG Krishi Vishwa Vidyalaya, Raipur-492 012 (Chhattisgarh)</b>		
Dr PK Joshi	Senior Scientist	Plant Breeding
Dr Parveen Kumar Sharma	Scientist	Agronomy
<b>Division of Olericulture, Sher-e-Kashmir University Agricultural Sciences &amp; Technology of Kashmir, Shalimar, Srinagar-191 121 (Jammu &amp; Kashmir)</b>		
Dr SH Khan	Associate Professor	Plant Breeding
Dr Faheema Mushtaq	Assistant Professor	Agronomy
<b>SAU BASED VOLUNTARY CENTER</b>		
<b>Division of Vegetable Sciences, VCSG Uttarakhand University of Horticulture and Forestry, Ranichauri Campus, Tehri-Garhwal (Uttarakhand)</b>		
Dr Akhilesh Chand Mishra	Associate Professor	Horticulture

\*Principal Investigators

## METEOROLOGICAL DATA OF DIFFERENT AICRP CENTERS DURING CROP SEASON 2016-17

## BHUBANESWAR

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
01.10.16	25.0	30.8	80.0	94.0	6.6	5.1
2	24.6	30.6	68.0	94.0	7.6	6.6
3	24.7	32.4	65.0	95.0	0.0	7.3
4	25.4	32.8	68.0	97.0	0.0	7.7
5	25.2	33.2	72.0	95.0	13.7	6.6
6	24.2	33.4	77.0	90.0	5.3	1.3
7	25.0	31.4	95.0	97.0	6.6	0.0
8	24.8	29.2	83.0	100.0	23.6	3.4
9	25.4	30.0	77.0	95.0	11.0	6.1
10	25.2	32.0	81.0	95.0	29.7	2.3
11	23.6	32.2	67.0	97.0	11.9	7.6
12	24.0	32.4	62.0	87.0	0.0	7.5
13	22.2	32.8	60.0	88.0	0.0	8.4
14	22.0	33.0	47.0	85.0	0.0	8.0
15	20.0	32.6	58.0	73.0	0.0	8.7
16	20.8	32.0	65.0	91.0	0.0	8.6
17	21.5	31.8	68.0	80.0	0.0	9.0
18	21.6	32.4	75.0	90.0	0.0	8.3
19	22.0	33.0	74.0	85.0	0.0	7.8
20	22.4	33.6	68.0	87.0	0.0	7.9
21	20.6	34.0	49.0	85.0	0.0	9.7
22	20.0	33.0	56.0	84.0	0.0	1.5
23	19.4	30.2	60.0	77.0	0.0	7.6
24	19.0	33.4	66.0	86.0	0.0	3.0
25	20.2	32.6	46.0	88.0	0.0	7.8
26	18.6	33.2	69.0	84.0	0.0	4.3
27	22.6	32.2	76.0	95.0	14.0	1.5
28	23.4	32.0	77.0	93.0	2.8	3.6
29	23.6	31.2	62.0	93.0	0.0	8.4
30	23.4	32.2	66.0	88.0	0.0	9.0
31	20.8	32.0	62.0	80.0	0.0	9.5
01.11.16	23.2	32.0	66.0	93.0	0.0	9.6
2	22.6	30.0	54.0	90.0	0.0	9.4
3	23.4	33.3	68.0	78.0	0.0	1.9
4	21.0	30.2	88.0	96.0	8.6	0.0
5	21.6	26.0	71.0	91.0	11.7	1.4
6	18.8	27.0	48.0	94.0	0.0	8.7
7	16.6	30.6	43.0	81.0	0.0	7.7
8	15.6	30.4	44.0	98.0	0.0	7.5
9	14.4	31.2	35.0	92.0	0.0	7.2
10	15.8	31.4	37.0	94.0	0.0	6.4
11	16.4	31.2	46.0	94.0	0.0	5.6
12	16.8	30.6	47.0	98.0	0.0	7.6
13	19.2	31.2	47.0	98.0	0.0	7.5
14	20.0	31.4	48.0	93.0	0.0	6.1
15	20.2	31.0	54.0	95.0	0.0	5.1
16	19.6	30.4	52.0	89.0	0.0	7.1
17	16.0	30.0	36.0	81.0	0.0	8.9
18	16.2	30.2	32.0	72.0	0.0	9.1
19	16.2	30.6	43.0	96.0	0.0	8.7

20	15.4	30.4	48.0	89.0	0.0	8.7
21	15.0	31.6	39.0	94.0	0.0	8.5
22	16.0	32.1	33.0	80.0	0.0	8.7
23	15.6	31.4	34.0	94.0	0.0	8.5
24	13.2	32.0	33.0	94.0	0.0	8.9
25	15.8	31.0	33.0	94.0	0.0	9.0
26	14.6	32.0	36.0	96.0	0.0	8.8
27	14.8	32.2	33.0	93.0	0.0	9.2
28	15.0	32.0	39.0	96.0	0.0	8.2
29	16.0	31.8	36.0	96.0	0.0	6.8
30	17.4	31.4	49.0	98.0	0.0	2.4
01.12.16	18.6	30.0	51.0	89.0	0.0	5.6
2	19.6	29.8	54.0	79.0	0.0	5.0
3	20.2	30.5	47.0	86.0	0.0	7.6
4	18.4	31.6	47.0	85.0	0.0	7.8
5	17.8	31.4	35.0	81.0	0.0	8.4
6	14.6	30.4	35.0	72.0	0.0	8.8
7	14.0	30.2	39.0	75.0	0.0	9.4
8	13.8	30.5	34.0	70.0	0.0	8.9
9	14.4	29.6	20.0	75.0	0.0	8.7
10	14.4	29.0	33.0	74.0	0.0	8.8
11	17.4	29.6	41.0	77.0	0.0	4.8
12	16.5	31.8	41.0	71.0	0.0	8.4
13	16.4	32.2	40.0	81.0	0.0	8.6
14	18.0	30.6	38.0	87.0	0.0	8.1
15	15.0	30.2	26.0	70.0	0.0	9.2
16	13.6	29.8	28.0	91.0	0.0	8.3
17	13.7	29.6	36.0	91.0	0.0	8.0
18	12.6	29.4	35.0	78.0	0.0	7.8
19	12.8	29.4	35.0	87.0	0.0	8.0
20	12.4	29.1	32.0	95.0	0.0	8.1
21	11.6	31.6	29.0	93.0	0.0	8.2
22	12.6	30.2	30.0	95.0	0.0	7.9
23	12.7	29.6	36.0	93.0	0.0	7.4
24	11.6	29.2	34.0	93.0	0.0	7.2
25	14.4	30.2	40.0	93.0	0.0	7.0
26	15.6	30.3	31.0	94.0	0.0	8.0
27	14.8	31.2	45.0	88.0	0.0	5.6
28	15.4	28.8	44.0	94.0	0.0	3.0
29	14.3	28.5	49.0	96.0	0.0	2.0
30	15.4	28.6	46.0	98.0	0.0	3.6
31	15.0	29.2	53.0	96.0	0.0	4.5
01.01.17	17.0	29.8	58.0	98.0	0.0	1.2
2	17.6	29.4	65.0	100.0	0.0	0.5
3	17.8	28.6	54.0	98.0	0.0	0.0
4	17.2	28.0	46.0	90.0	0.0	2.7
5	14.6	28.6	32.0	96.0	0.0	8.2
6	15.0	30.0	28.0	94.0	0.0	8.5
7	13.0	30.3	39.0	95.0	0.0	7.4
8	14.4	29.8	29.0	98.0	0.0	8.4
9	14.0	31.8	31.0	93.0	0.0	7.7
10	15.6	31.3	38.0	94.0	0.0	6.7
11	16.2	31.0	46.0	81.0	0.0	4.9
12	15.6	29.2	43.0	78.0	0.0	5.4
13	13.2	26.8	42.0	67.0	0.0	5.2
14	13.3	26.5	39.0	71.0	0.0	6.9
15	12.2	26.6	32.0	70.0	0.0	8.4
16	9.8	26.8	29.0	95.0	0.0	8.0
17	11.4	28.6	33.0	97.0	0.0	7.6

18	14.0	30.8	36.0	95.0	0.0	7.7
19	13.2	30.4	34.0	81.0	0.0	8.9
20	14.6	30.6	31.0	83.0	0.0	8.8
21	13.8	30.6	35.0	83.0	0.0	7.6
22	13.4	30.7	28.0	75.0	0.0	8.1
23	15.2	31.3	30.0	96.0	0.0	7.3
24	14.0	32.0	31.0	93.0	0.0	7.9
25	12.6	31.6	33.0	91.0	0.0	8.4
26	13.0	30.6	37.0	93.0	0.0	6.9
27	16.2	31.8	47.0	94.0	0.0	0.0
28	14.0	26.6	44.0	95.0	0.0	8.0
29	17.0	30.8	38.0	90.0	0.0	7.9
30	15.1	30.2	41.0	98.0	0.0	7.1
31	17.0	31.0	36.0	96.0	0.0	7.9
01.02.17	17.6	32.6	42.0	96.0	0.0	6.9
2	20.2	33.0	41.0	98.0	0.0	5.5
3	20.0	30.6	48.0	96.0	0.0	5.9
4	16.0	31.0	35.0	94.0	0.0	8.6
5	14.2	30.4	38.0	93.0	0.0	8.2
6	14.6	32.8	30.0	96.0	0.0	8.6
7	15.8	33.8	28.0	94.0	0.0	8.9
8	16.4	34.2	32.0	88.0	0.0	9.0
9	18.4	33.4	30.0	96.0	0.0	6.9
10	20.4	34.6	29.0	98.0	0.0	7.1
11	20.6	34.0	41.0	96.0	0.0	8.6
12	17.8	33.6	42.0	100.0	0.0	7.2
13	16.8	33.6	33.0	96.0	0.0	8.8
14	16.6	33.2	34.0	92.0	0.0	8.7
15	18.0	33.8	41.0	78.0	0.0	7.8
16	16.8	34.0	33.0	94.0	0.0	8.4
17	17.2	34.4	34.0	90.0	0.0	8.4
18	19.0	34.0	38.0	90.0	0.0	8.1
19	21.0	34.2	48.0	96.0	0.0	8.0
20	21.0	34.8	28.0	94.0	0.0	9.3
21	22.6	35.8	40.0	96.0	0.0	8.6
22	23.6	36.0	58.0	90.0	0.0	7.8
23	24.4	35.0	43.0	92.0	0.0	8.0
24	24.0	35.8	46.0	93.0	0.0	4.8
25	20.6	34.4	30.0	86.0	0.0	7.8
26	19.4	33.6	46.0	96.0	0.0	9.5
27	19.2	34.8	37.0	97.0	0.0	8.0
28	22.2	35.2	39.0	98.0	0.0	6.8
01.03.17	20.8	34.5	38.0	94.0	0.0	8.0
2	20.2	36.0	26.0	94.0	0.0	8.8
3	21.4	37.6	28.0	93.0	0.0	7.8
4	21.4	38.2	37.0	86.0	0.0	7.7
5	24.0	36.0	34.0	89.0	0.0	7.3
6	24.4	35.6	55.0	87.0	0.0	5.4
7	23.8	35.0	58.0	93.0	6.6	4.8
8	22.4	33.0	68.0	96.0	10.2	1.8
9	22.0	27.4	54.0	96.0	9.6	3.1
10	23.4	32.2	70.0	92.0	0.5	5.0
11	20.0	33.4	40.0	98.0	18.5	4.1
12	21.4	32.2	29.0	95.0	0.0	9.3
13	22.0	34.0	32.0	95.0	0.0	7.6
14	20.2	31.2	50.0	86.0	0.0	7.6
15	21.8	32.8	55.0	95.0	0.0	5.3
16	22.0	32.6	36.0	91.0	0.0	8.2
17	22.0	34.2	37.0	93.0	0.0	7.8

18	21.8	34.6	39.0	90.0	0.0	7.5
19	22.6	34.6	45.0	93.0	0.0	6.6
20	22.0	34.0	36.0	85.0	0.0	8.3
21	20.8	32.6	31.0	86.0	0.0	8.9
22	21.6	36.0	34.0	90.0	0.0	8.6
23	24.0	37.2	35.0	88.0	0.0	8.5
24	23.3	37.7	34.0	92.0	0.0	7.7
25	25.0	39.0	43.0	90.0	0.0	7.7
26	25.2	36.2	36.0	86.0	0.0	7.4
27	25.0	34.2	53.0	92.0	0.0	7.8
28	25.6	36.0	36.0	86.0	0.0	8.3
29	25.2	35.0	50.0	87.0	0.0	8.3
30	25.4	36.2	51.0	86.0	0.0	8.0
31	25.6	36.5	48.0	87.0	0.0	7.1

#### CHHINDWARA

Date	Temperature (°C)		Relative Humidity (%)		Sun shine (hrs)
	Min.	Max.	Min.	Max.	
01.11.16	13.3	31.3	38.0	62.0	0.0
2	13.7	30.4	38.0	61.0	0.0
3	11.9	30.8	37.0	65.0	0.0
4	13.1	28.9	26.0	65.0	0.0
5	13.8	28.2	39.0	65.0	0.0
6	16.3	31.4	32.0	87.0	0.0
7	16.6	31.6	30.0	85.0	0.0
8	16.4	31.3	28.0	75.0	0.0
9	15.3	32.3	20.0	77.0	0.0
10	15.0	31.4	16.0	75.0	0.0
11	14.0	30.6	16.0	75.0	0.0
12	14.0	30.8	17.0	74.0	0.0
13	13.0	29.0	17.0	72.0	0.0
14	13.0	28.9	27.0	77.0	0.0
15	12.9	29.4	27.0	77.0	0.0
16	12.9	28.0	27.0	77.0	0.0
17	12.7	28.6	27.0	77.0	0.0
18	11.8	27.5	27.4	78.0	0.0
19	11.6	27.8	28.0	78.0	0.0
20	11.5	27.4	27.0	76.0	0.0
21	11.0	29.0	27.0	77.0	0.0
22	9.6	30.6	49.0	80.0	0.0
23	9.8	31.0	24.0	80.0	0.0
24	8.8	30.5	24.0	76.0	0.0
25	8.8	31.0	50.0	76.0	0.0
26	9.2	31.0	56.0	71.0	0.0
27	9.3	30.0	58.0	73.0	0.0
28	10.8	30.0	59.0	69.0	0.0
29	10.4	30.0	57.0	67.0	0.0
30	10.5	28.0	58.0	68.0	0.0
01.12.16	10.2	29.4	38.0	71.0	0.0
2	9.8	29.0	36.0	79.0	0.0
3	9.6	0.5	31.0	61.0	0.0
4	9.2	21.6	32.0	69.0	0.0
5	10.4	28.3	37.0	69.0	0.0
6	10.1	29.5	34.0	65.0	0.0
7	9.2	30.8	32.0	71.0	0.0
8	9.1	29.6	31.0	62.0	0.0
9	8.6	28.8	36.0	72.0	0.0
10	8.2	27.2	35.0	61.0	0.0



11	7.8	26.5	34.0	68.0	0.0
12	9.1	27.6	36.0	61.0	0.0
13	7.2	28.1	31.0	64.0	0.0
14	9.2	28.4	32.0	64.0	0.0
15	9.3	29.6	30.0	76.0	0.0
16	8.7	29.6	30.0	80.0	0.0
17	7.8	28.3	30.0	78.0	0.0
18	7.1	26.2	31.0	80.0	0.0
19	6.9	27.4	31.0	72.0	0.0
20	6.2	27.4	31.0	68.0	0.0
21	5.6	27.0	31.0	68.0	0.0
22	6.8	26.8	32.0	69.0	0.0
23	6.9	26.9	34.0	67.0	0.0
24	7.2	27.5	37.0	66.0	0.0
25	7.1	27.5	32.0	68.0	0.0
26	6.8	27.2	31.0	69.0	0.0
27	6.7	28.3	31.0	82.0	0.0
28	6.7	27.0	29.0	61.0	0.0
29	7.2	29.0	25.0	79.0	0.0
30	7.2	30.6	27.0	82.0	0.0
31	7.1	29.5	28.0	82.0	0.0
01.01.17	7.2	29.5	28.0	82.0	0.0
2	7.7	27.4	26.0	79.0	0.0
3	8.2	28.1	27.0	67.0	0.0
4	10.4	29.6	28.0	68.0	0.0
5	11.8	28.2	27.0	67.0	0.0
6	10.9	27.3	24.0	71.0	0.0
7	11.7	27.8	21.0	62.0	0.0
8	12.1	26.4	21.3	62.0	0.0
9	9.0	24.0	52.0	95.0	7.0
10	6.0	22.0	30.0	65.0	0.0
11	4.0	22.0	32.0	62.0	0.0
12	4.0	27.0	30.0	69.0	0.0
13	4.0	25.0	34.0	60.0	0.0
14	7.0	26.0	34.0	62.0	0.0
15	10.0	26.0	34.0	89.0	0.0
16	10.7	29.0	35.0	80.0	0.0
17	10.7	29.0	40.0	81.0	0.0
18	10.2	29.4	34.0	88.0	0.0
19	10.0	30.2	28.0	88.0	0.0
20	11.2	29.0	42.0	86.0	0.0
21	11.2	29.8	31.0	71.0	0.0
22	12.3	30.0	28.0	78.0	0.0
23	13.4	29.4	16.0	68.0	0.0
24	13.8	29.6	20.0	78.0	0.0
25	14.1	28.8	26.0	72.0	0.0
26	14.2	28.6	32.0	73.0	0.0
27	13.4	27.4	31.0	75.0	0.0
28	13.2	26.1	31.0	80.0	0.0
29	13.6	27.5	38.0	88.0	0.0
30	13.1	28.3	28.0	89.0	0.0
31	12.9	28.5	29.0	80.0	0.0
01.02.17	14.8	31.2	62.0	32.0	0.0
2	14.6	30.3	51.0	28.0	0.0
3	13.3	31.2	57.0	31.0	0.0
4	12.1	30.6	52.0	25.0	0.0
5	12.4	31.6	58.0	20.0	0.0
6	12.5	32.1	62.0	15.0	0.0
7	9.8	30.5	81.0	16.0	0.0

8	8.2	29.2	61.0	11.0	0.0
9	11.2	31.0	60.0	20.0	0.0
10	11.2	31.2	46.0	21.0	0.0
11	13.4	29.2	56.0	17.0	0.0
12	16.2	24.6	54.0	18.0	0.0
13	14.1	28.4	64.0	21.0	0.0
14	14.6	29.5	82.0	28.0	0.0
15	15.0	30.8	82.0	28.0	0.0
16	14.8	29.8	78.0	25.0	0.0
17	15.0	30.0	58.0	22.0	0.0
18	14.0	31.0	56.0	21.0	0.0
19	14.0	32.0	53.0	22.0	0.0
20	14.0	32.0	54.0	23.0	0.0
21	14.2	31.8	56.0	24.0	0.0
22	14.7	31.9	51.0	25.0	0.0
23	13.0	32.0	56.0	24.0	0.0
24	12.0	32.4	57.0	23.0	0.0
25	8.7	32.4	58.0	22.0	0.0
26	8.7	32.4	59.0	19.0	0.0
27	11.2	32.0	59.0	20.0	0.0
28	18.6	33.2	58.0	21.0	0.0
01.03.17	11.8	33.8	25.0	64.0	0.0
2	13.4	35.1	24.0	52.0	0.0
3	14.2	34.3	19.0	53.0	0.0
4	15.7	35.2	29.0	48.0	0.0
5	15.2	36.1	25.0	64.0	0.0
6	16.1	36.5	31.0	59.0	0.0
7	17.6	37.2	18.0	51.0	0.0
8	17.5	38.3	28.0	69.0	0.0
9	18.0	37.4	26.0	66.0	0.0
10	19.1	37.6	31.0	45.0	0.0
11	20.3	38.6	30.0	52.0	0.0
12	20.8	36.8	18.0	55.0	0.0
13	19.6	37.7	27.0	52.0	0.0
14	20.4	37.3	17.0	64.0	0.0
15	18.6	36.8	24.0	43.0	0.0

## DEESA

Date	Temperature (°C)		Relative Humidity (%)		Sun shine (hrs)
	Min.	Max.	Min.	Max.	
01.11.16	17.2	34.5	28.0	62.0	0.0
2	16.9	34.8	31.0	54.0	0.0
3	17.0	34.4	34.0	60.0	0.0
4	17.0	34.0	34.0	64.0	0.0
5	16.7	34.0	33.0	65.0	0.0
6	16.6	34.4	35.0	59.0	0.0
7	16.6	34.8	33.0	64.0	0.0
8	15.6	34.0	34.0	68.0	0.0
9	15.2	35.0	33.0	68.0	0.0
10	15.2	35.0	35.0	65.0	0.0
11	15.2	34.0	41.0	77.0	0.0
12	15.7	32.4	44.0	73.0	0.0
13	17.2	32.4	36.0	56.0	0.0
14	16.2	31.4	35.0	64.0	0.0
15	14.4	31.6	33.0	65.0	0.0
16	15.6	31.6	35.0	62.0	0.0
17	15.2	33.4	34.0	71.0	0.0
18	14.8	33.0	34.0	70.0	0.0

19	14.3	33.2	36.0	72.0	0.0
20	14.4	33.6	30.0	72.0	0.0
21	14.1	34.3	28.0	70.0	0.0
22	14.5	34.4	35.0	76.0	0.0
23	15.0	34.0	34.0	74.0	0.0
24	15.1	34.2	38.0	76.0	0.0
25	15.8	34.2	31.0	70.0	0.0
26	15.2	34.6	35.0	67.0	0.0
27	15.6	34.6	32.0	60.0	0.0
28	15.2	34.6	28.0	65.0	0.0
29	14.1	34.8	33.0	67.0	0.0
30	13.7	33.3	41.0	69.0	0.0
01.12.16	14.6	32.3	32.0	80.0	0.0
2	15.7	33.4	38.0	71.0	0.0
3	16.3	32.2	32.0	71.0	0.0
4	15.4	31.4	32.0	63.0	0.0
5	13.6	31.0	39.0	74.0	0.0
6	13.6	31.4	37.0	71.0	0.0
7	13.5	33.0	40.0	76.0	0.0
8	13.8	34.2	36.0	75.0	0.0
9	13.6	32.6	41.0	79.0	0.0
10	14.5	32.6	42.0	79.0	0.0
11	14.6	32.0	41.0	76.0	0.0
12	14.6	32.2	35.0	83.0	0.0
13	14.2	30.6	39.0	77.0	0.0
14	14.5	30.8	39.0	71.0	0.0
15	14.3	31.3	37.0	67.0	0.0
16	13.3	30.8	34.0	72.0	0.0
17	14.2	31.2	37.0	71.0	0.0
18	13.5	30.8	55.0	74.0	0.0
19	14.2	29.8	52.0	83.0	0.0
20	13.6	29.2	48.0	82.0	0.0
21	13.2	29.8	52.0	74.0	0.0
22	12.3	30.2	46.0	74.0	0.0
23	11.7	31.2	42.0	78.0	0.0
24	12.1	31.1	54.0	82.0	0.0
25	12.0	29.8	27.0	77.0	0.0
26	10.7	29.0	37.0	50.0	0.0
27	11.2	28.4	34.0	75.0	0.0
28	11.6	29.5	38.0	80.0	0.0
29	12.0	30.4	35.0	82.0	0.0
30	12.8	32.9	40.0	76.0	0.0
31	12.7	31.6	50.0	80.0	0.0
01.01.17	12.8	29.4	46.0	82.0	0.0
2	12.3	28.0	41.0	80.0	0.0
3	12.0	29.5	35.0	82.0	0.0
4	12.2	28.7	40.0	82.0	0.0
5	11.7	29.0	46.0	79.0	0.0
6	14.2	28.2	63.0	87.0	0.0
7	15.5	25.4	59.0	89.0	0.0
8	12.3	25.5	40.0	80.0	0.0
9	11.3	25.1	47.0	81.0	0.0
10	11.2	24.5	41.0	74.0	0.0
11	6.8	24.4	31.0	68.0	0.0
12	6.0	25.0	45.0	63.0	0.0
13	7.0	24.8	27.0	68.0	0.0
14	9.4	25.2	30.0	56.0	0.0
15	12.7	25.2	35.0	55.0	0.0
16	11.4	27.9	30.0	68.0	0.0

17	9.2	24.5	25.0	61.0	0.0
18	9.3	24.5	28.0	61.0	0.0
19	10.0	27.0	31.0	69.0	0.0
20	13.1	25.9	41.0	59.0	0.0
21	13.4	22.1	52.0	67.0	0.0
22	14.2	29.2	51.0	73.0	0.0
23	14.7	30.4	41.0	77.0	0.0
24	15.5	31.0	34.0	78.0	0.0
25	17.0	33.5	43.0	75.0	0.0
26	17.4	31.0	45.0	71.0	0.0
27	11.8	25.4	32.0	79.0	0.0
28	11.4	26.0	38.0	77.0	0.0
29	12.4	28.0	41.0	64.0	0.0
30	11.0	29.6	28.0	77.0	0.0
31	10.4	31.2	30.0	78.0	0.0
01.02.17	12.0	30.6	25.0	71.0	0.0
2	13.4	31.7	25.0	70.0	0.0
3	13.8	32.6	38.0	69.0	0.0
4	17.0	32.0	51.0	67.0	0.0
5	14.0	27.2	29.0	68.0	0.0
6	9.0	25.4	24.0	67.0	0.0
7	10.2	27.6	26.0	65.0	0.0
8	11.0	29.4	24.0	66.0	0.0
9	12.0	29.0	22.0	48.0	0.0
10	11.0	27.0	24.0	50.0	0.0
11	11.2	29.0	28.0	60.0	0.0
12	12.6	29.6	28.0	65.0	0.0
13	14.0	30.1	35.0	64.0	0.0
14	16.7	31.6	38.0	57.0	0.0
15	17.2	34.0	35.0	61.0	0.0
16	18.6	34.4	35.0	62.0	0.0
17	18.4	35.4	24.0	65.0	0.0
18	18.5	36.4	25.0	55.0	0.0
19	18.0	37.6	27.0	62.0	0.0
20	19.3	37.0	34.0	68.0	0.0
21	15.4	32.0	30.0	57.0	0.0
22	14.6	30.2	24.0	74.0	0.0
23	13.0	31.6	19.0	56.0	0.0
24	13.4	33.6	19.0	55.0	0.0
25	14.6	34.4	23.0	43.0	0.0
26	15.5	35.2	16.0	47.0	0.0
27	16.8	36.0	17.0	46.0	0.0
28	17.3	36.2	17.0	54.0	0.0
01.03.17	19.2	37.0	19.0	40.0	0.0
2	18.2	35.4	17.0	44.0	0.0
3	18.7	34.2	18.0	40.0	0.0
4	17.5	34.1	15.0	46.0	0.0
5	15.8	33.2	7.0	42.0	0.0
6	16.0	34.0	12.0	30.0	0.0
7	17.0	34.5	30.0	50.0	0.0
8	21.4	34.0	22.0	56.0	0.0
9	19.4	33.4	24.0	70.0	0.0
10	21.0	32.6	18.0	66.0	0.0
11	14.8	32.2	9.0	37.0	0.0
12	11.2	29.1	5.0	44.0	0.0
13	12.5	30.1	8.0	39.0	0.0
14	13.8	32.8	7.0	35.0	0.0
15	19.4	35.3	9.0	29.0	0.0

**DEESA (Ladol)**

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min.	Max.	Min.	Max.	
22.10.16	16.0	33.5	48.0	91.0	0.0
17	16.5	33.5	43.0	86.0	0.0
18	16.0	33.0	59.0	81.0	0.0
19	16.0	33.5	72.0	74.0	0.0
20	16.0	32.0	68.0	74.0	0.0
21	16.5	32.0	68.0	74.0	0.0
22	16.5	33.5	68.0	74.0	0.0
23	16.0	33.5	68.0	74.0	0.0
24	16.0	33.0	72.0	78.0	0.0
25	15.5	32.5	66.0	72.0	0.0
26	16.0	33.5	48.0	91.0	0.0
27	16.5	33.5	43.0	86.0	0.0
28	16.0	33.0	59.0	81.0	0.0
29	16.0	33.5	72.0	74.0	0.0
30	16.0	32.0	68.0	74.0	0.0
31	16.5	32.0	68.0	74.0	0.0
01.11.16	17.2	34.5	28.0	62.0	0.0
2	16.9	34.8	31.0	54.0	0.0
3	17.0	34.4	34.0	60.0	0.0
4	17.0	34.0	34.0	64.0	0.0
5	16.7	34.0	33.0	65.0	0.0
6	16.6	34.4	35.0	59.0	0.0
7	16.6	34.8	33.0	64.0	0.0
8	15.6	34.0	34.0	68.0	0.0
9	15.2	35.0	33.0	68.0	0.0
10	15.2	35.0	35.0	65.0	0.0
11	15.2	34.0	41.0	77.0	0.0
12	15.7	32.4	44.0	73.0	0.0
13	17.2	32.4	36.0	56.0	0.0
14	16.2	31.4	35.0	64.0	0.0
15	14.4	31.6	33.0	65.0	0.0
16	15.6	31.6	35.0	62.0	0.0
17	15.2	33.4	34.0	71.0	0.0
18	14.8	33.0	34.0	70.0	0.0
19	14.3	33.2	36.0	72.0	0.0
20	14.4	33.6	30.0	72.0	0.0
21	14.1	34.3	28.0	70.0	0.0
22	14.5	34.4	35.0	76.0	0.0
23	15.0	34.0	34.0	74.0	0.0
24	15.1	34.2	38.0	76.0	0.0
25	15.8	34.2	31.0	70.0	0.0
26	15.2	34.6	35.0	67.0	0.0
27	15.6	34.6	32.0	60.0	0.0
28	15.2	34.6	28.0	65.0	0.0
29	14.1	34.8	33.0	67.0	0.0
30	13.7	33.3	41.0	69.0	0.0
01.12.16	14.6	32.3	32.0	80.0	0.0
2	15.7	33.4	38.0	71.0	0.0
3	16.3	32.2	32.0	71.0	0.0
4	15.4	31.4	32.0	63.0	0.0
5	13.6	31.0	39.0	74.0	0.0
6	13.6	31.4	37.0	71.0	0.0
7	13.5	33.0	40.0	76.0	0.0
8	13.8	34.2	36.0	75.0	0.0
9	13.6	32.6	41.0	79.0	0.0

10	14.5	32.6	42.0	79.0	0.0
11	14.6	32.0	41.0	76.0	0.0
12	14.6	32.2	35.0	83.0	0.0
13	14.2	30.6	39.0	77.0	0.0
14	14.5	30.8	39.0	71.0	0.0
15	14.3	31.3	37.0	67.0	0.0
16	13.3	30.8	34.0	72.0	0.0
17	14.2	31.2	37.0	71.0	0.0
18	13.5	30.8	55.0	74.0	0.0
19	14.2	29.8	52.0	83.0	0.0
20	13.6	29.2	48.0	82.0	0.0
21	13.2	29.8	52.0	74.0	0.0
22	12.3	30.2	46.0	74.0	0.0
23	11.7	31.2	42.0	78.0	0.0
24	12.1	31.1	54.0	82.0	0.0
25	12.0	29.8	27.0	77.0	0.0
26	10.7	29.0	37.0	50.0	0.0
27	11.2	28.4	34.0	75.0	0.0
28	11.6	29.5	38.0	80.0	0.0
29	12.0	30.4	35.0	82.0	0.0
30	12.8	32.9	40.0	76.0	0.0
31	12.7	31.6	50.0	80.0	0.0
01.01.17	12.8	29.4	46.0	82.0	0.0
2	12.3	28.0	41.0	80.0	0.0
3	12.0	29.5	35.0	82.0	0.0
4	12.2	28.7	40.0	82.0	0.0
5	11.7	29.0	46.0	79.0	0.0
6	14.2	28.2	63.0	87.0	0.0
7	15.5	25.4	59.0	89.0	0.0
8	12.3	25.5	40.0	80.0	0.0
9	11.3	25.1	47.0	81.0	0.0
10	11.2	24.5	41.0	74.0	0.0
11	6.8	24.4	31.0	68.0	0.0
12	6.0	25.0	45.0	63.0	0.0
13	7.0	24.8	27.0	68.0	0.0
14	9.4	25.2	30.0	56.0	0.0
15	12.7	25.2	35.0	55.0	0.0
16	11.4	27.9	30.0	68.0	0.0
17	9.2	24.5	25.0	61.0	0.0
18	9.3	24.5	28.0	61.0	0.0
19	10.0	27.0	31.0	69.0	0.0
20	13.1	25.9	41.0	59.0	0.0
21	13.4	22.1	52.0	67.0	0.0
22	14.2	29.2	51.0	73.0	0.0
23	14.7	30.4	41.0	77.0	0.0
24	15.5	31.0	34.0	78.0	0.0
25	17.0	33.5	43.0	75.0	0.0
26	17.4	31.0	45.0	71.0	0.0
27	11.8	25.4	32.0	79.0	0.0
28	11.4	26.0	38.0	77.0	0.0
29	12.4	28.0	41.0	64.0	0.0
30	11.0	29.6	28.0	77.0	0.0
31	10.4	31.2	30.0	78.0	0.0
01.02.17	12.0	30.6	25.0	71.0	0.0
2	13.4	31.7	25.0	70.0	0.0
3	13.8	32.6	38.0	69.0	0.0
4	17.0	32.0	51.0	67.0	0.0
5	14.0	27.2	29.0	68.0	0.0
6	9.0	25.4	24.0	67.0	0.0

7	10.2	27.6	26.0	65.0	0.0
8	11.0	29.4	24.0	66.0	0.0
9	12.0	29.0	22.0	48.0	0.0
10	11.0	27.0	24.0	50.0	0.0
11	11.2	29.0	28.0	60.0	0.0
12	12.6	29.6	28.0	65.0	0.0
13	14.0	30.1	35.0	64.0	0.0
14	16.7	31.6	38.0	57.0	0.0
15	17.2	34.0	35.0	61.0	0.0
16	18.6	34.4	35.0	62.0	0.0
17	18.4	35.4	24.0	65.0	0.0
18	18.5	36.4	25.0	55.0	0.0
19	18.0	37.6	27.0	62.0	0.0
20	19.3	37.0	34.0	68.0	0.0
21	15.4	32.0	30.0	57.0	0.0
22	14.6	30.2	24.0	74.0	0.0
23	13.0	31.6	19.0	56.0	0.0
24	13.4	33.6	19.0	55.0	0.0
25	14.6	34.4	23.0	43.0	0.0
26	15.5	35.2	16.0	47.0	0.0
27	16.8	36.0	17.0	46.0	0.0
28	17.3	36.2	17.0	54.0	0.0
01.03.17	19.2	37.0	19.0	40.0	0.0
2	18.2	35.4	17.0	44.0	0.0
3	18.7	34.2	18.0	40.0	0.0
4	17.5	34.1	15.0	46.0	0.0
5	15.8	33.2	7.0	42.0	0.0
6	16.0	34.0	12.0	30.0	0.0
7	17.0	34.5	30.0	50.0	0.0
8	21.4	34.0	22.0	56.0	0.0
9	19.4	33.4	24.0	70.0	0.0
10	21.0	32.6	18.0	66.0	0.0
11	14.8	32.2	9.0	37.0	0.0
12	11.2	29.1	5.0	44.0	0.0
13	12.5	30.1	8.0	39.0	0.0
14	13.8	32.8	7.0	35.0	0.0
15	19.4	35.3	9.0	29.0	0.0

## DHARWAD

Standard week	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min.	Max.	Min.	Max.	
1 - 7 Jan	13.6	30.3	23.0	51.6	0.0
8 - 14 Jan	12.0	29.7	20.6	49.3	0.0
15 - 21 Jan	14.5	28.2	41.4	71.6	0.4
22 - 28 Jan	16.0	30.7	36.0	63.3	0.0
29 Jan - 4 Feb	14.8	33.7	19.7	43.6	0.0
5 - 11 Feb	17.0	32.6	34.3	74.6	0.0
12 - 18 Feb	17.0	32.0	35.3	59.9	0.0
19 - 25 Feb	20.3	35.0	32.3	57.4	0.0
26 Feb - 4 Mar	20.2	34.5	27.4	57.6	0.2
5 - 11 Mar	20.4	35.7	24.1	51.4	0.0
12 - 18 Mar	19.3	34.9	23.8	53.0	0.0
19 - 25 Mar	21.4	38.0	20.3	42.4	0.0
26 Mar - 1 Apr	21.1	36.7	44.1	75.9	2.4
2 - 8 Apr	21.3	36.7	45.4	73.4	8.6
9 - 15 Apr	21.7	38.1	33.7	67.1	0.0
16 - 22 Apr	22.1	38.8	42.0	71.0	4.8
23 - 29 Apr	21.2	38.6	32.3	56.7	6.8

30 Apr - 6 May	22.1	38.7	35.7	75.6	0.2
7 - 13 May	21.4	38.2	35.1	65.4	34.0
14 - 20 May	21.8	35.0	58.7	81.3	48.8
21 - 27 May	23.0	33.3	56.7	80.6	0.0
28 May - 3 Jun	22.2	34.2	50.7	75.7	7.0
4 - 10 Jun	21.6	30.2	75.0	87.6	34.2
11 - 17 Jun	21.3	28.4	63.9	85.7	5.8
18 - 24 Jun	20.8	28.9	75.7	86.9	6.6
25 Jun - 1 Jul	21.4	26.4	81.9	88.3	23.4
2 - 8 Jul	21.5	26.4	84.1	91.3	36.4
9 - 15 Jul	21.1	25.9	83.6	90.3	61.0
16 - 22 Jul	20.6	26.7	80.9	91.1	27.2
23 - 29 Jul	20.8	26.6	85.1	93.1	21.6
30 Jul - 5 Aug	20.4	24.7	83.7	92.1	37.4
6 - 12 Aug	20.9	26.1	85.0	92.4	26.0
13 - 19 Aug	20.7	26.6	78.4	88.7	15.8
20 - 26 Aug	20.3	27.1	75.4	88.7	9.2
27 Aug - 2 Sep	20.4	27.3	78.7	91.3	28.8
3 - 9 Sep	19.7	27.4	73.4	84.7	0.4
10 - 16 Sep	19.9	27.2	81.7	88.1	14.8
17 - 23 Sep	20.0	25.6	85.1	90.4	11.8
24 - 30 Sep	20.5	27.7	81.0	88.9	44.0
1 - 7 Oct	19.5	27.2	70.6	88.6	6.2
8 - 14 Oct	20.2	28.9	75.3	88.9	38.6
15 - 21 Oct	16.3	30.8	39.0	59.3	0.0
22 - 28 Oct	18.5	31.1	39.1	63.3	0.0
29 Oct - 4 Nov	18.4	31.5	43.0	65.3	0.4
5 - 11 Nov	12.6	30.3	27.7	43.0	0.0
12 - 18 Nov	17.2	31.0	45.0	68.9	5.4
19 - 25 Nov	13.2	30.1	35.1	55.6	0.0
26 Nov - 2 Dec	13.1	31.4	29.9	45.7	0.0
3 Dec - 9 Dec	16.2	29.4	44.0	64.7	0.0
10 - 16 Dec	15.1	29.0	43.6	61.6	0.0
17 - 23 Dec	13.4	30.6	35.0	54.3	0.0
24 - 31 Dec	11.8	30.5	25.9	52.6	0.0

## DHOLI

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
01.10.16	25.5	32.2	70.0	94.0	0.0	5.4
2	25.6	34.0	62.0	88.0	0.0	7.6
3	23.2	35.0	72.0	88.0	0.0	6.8
4	26.5	35.6	65.0	92.0	0.0	7.0
5	25.4	35.5	61.0	89.0	0.0	7.2
6	26.1	35.0	70.0	90.0	0.0	7.8
7	25.2	34.1	69.0	92.0	1.0	7.9
8	24.5	33.0	89.0	92.0	3.2	6.6
9	23.2	34.8	86.0	93.0	21.8	2.2
10	23.6	27.2	68.0	92.0	3.2	0.0
11	24.1	31.5	80.0	87.0	0.0	5.9
12	23.2	32.2	55.0	95.0	5.4	4.1
13	22.5	32.5	54.0	87.0	0.0	7.7
14	22.5	32.5	60.0	95.0	0.0	7.6
15	21.5	32.0	59.0	85.0	0.0	4.1
16	21.2	32.5	58.0	90.0	0.0	7.8
17	27.2	33.5	51.0	85.0	0.0	9.1
18	27.1	34.0	46.0	91.0	0.0	9.0
19	21.1	33.5	50.0	86.0	0.0	8.5



20	21.9	32.8	44.0	86.0	0.0	8.2
21	21.2	32.0	46.0	86.0	0.0	8.4
22	21.1	32.8	46.0	84.0	0.0	8.8
23	22.4	32.5	41.0	91.0	0.0	6.7
24	24.0	32.0	55.0	89.0	0.0	6.5
25	20.5	32.0	46.0	93.0	0.0	5.6
26	20.6	32.0	52.0	86.0	0.0	8.0
27	20.0	32.6	51.0	81.0	0.0	7.7
28	20.5	32.4	52.0	81.0	0.0	9.0
29	20.2	32.0	44.0	88.0	0.0	7.6
30	20.1	31.5	53.0	81.0	0.0	7.1
31	20.2	31.5	40.0	86.0	0.0	7.0
01.11.16	19.7	32.0	44.0	80.0	0.0	8.3
2	19.6	32.0	41.0	85.0	0.0	9.1
3	19.5	32.0	43.0	85.0	0.0	8.7
4	19.3	32.5	35.0	85.0	0.0	9.3
5	19.3	32.5	40.0	90.0	0.0	9.3
6	19.1	31.0	33.0	86.0	0.0	8.4
7	19.2	30.5	34.0	89.0	0.0	6.7
8	18.5	30.0	38.0	87.0	0.0	6.5
9	17.2	30.0	42.0	80.0	0.0	4.7
10	17.1	30.5	43.0	88.0	0.0	6.0
11	17.1	30.0	40.0	86.0	0.0	6.5
12	17.0	31.1	42.0	77.0	0.0	8.0
13	17.0	30.6	42.0	84.0	0.0	7.0
14	16.8	30.0	49.0	83.0	0.0	7.2
15	16.7	29.0	29.0	93.0	0.0	7.0
16	15.1	29.0	30.0	78.0	0.0	7.4
17	14.1	29.0	32.0	81.0	0.0	7.8
18	14.1	28.0	33.0	88.0	0.0	8.0
19	14.5	27.5	46.0	88.0	0.0	6.7
20	13.1	25.6	50.0	79.0	0.0	6.8
21	13.0	28.0	40.0	83.0	0.0	5.8
22	13.8	28.0	54.0	87.0	0.0	5.7
23	13.4	26.5	47.0	84.0	0.0	5.6
24	13.4	27.0	54.0	89.0	0.0	3.2
25	13.6	26.8	59.0	93.0	0.0	3.0
26	13.8	26.2	61.0	96.0	0.0	1.6
27	13.4	26.0	57.0	97.0	0.0	0.0
28	12.7	26.0	55.0	87.0	0.0	2.0
29	14.5	26.0	61.0	91.0	0.0	2.4
30	12.5	27.0	52.0	94.0	0.0	0.0
01.12.16	14.4	28.5	62.0	87.0	0.0	4.5
2	15.5	28.0	56.0	88.0	0.0	2.1
3	14.2	27.2	61.0	89.0	0.0	0.0
4	14.0	27.0	60.0	80.0	0.0	0.0
5	12.0	22.5	42.0	91.0	0.0	0.7
6	12.8	21.0	60.0	68.0	0.0	0.0
7	10.4	23.5	74.0	95.0	0.0	3.3
8	9.6	20.2	76.0	95.0	0.0	2.8
9	11.6	18.0	63.0	88.0	0.0	0.0
10	10.5	18.5	60.0	93.0	0.0	2.0
11	9.5	18.0	88.0	90.0	0.0	3.2
12	10.5	16.8	70.0	93.0	0.0	0.0
13	9.5	17.8	64.0	88.0	0.0	0.0
14	8.5	18.8	65.0	92.0	0.0	0.7
15	10.8	21.0	57.0	93.0	0.0	3.1
16	8.5	21.5	61.0	89.0	0.0	3.3
17	10.5	21.8	65.0	92.0	0.0	3.6

18	10.5	21.0	60.0	90.0	0.0	3.6
19	11.0	25.5	54.0	91.0	0.0	5.6
20	10.8	25.2	57.0	90.0	0.0	7.0
21	9.0	24.0	58.0	88.0	0.0	4.0
22	10.0	23.8	54.0	90.0	0.0	0.0
23	11.5	23.2	57.0	95.0	0.0	0.0
24	13.5	25.8	63.0	93.0	0.0	4.9
25	12.6	26.0	76.0	93.0	0.0	3.3
26	12.2	25.2	73.0	95.0	0.0	0.0
27	16.0	23.5	73.0	95.0	0.0	0.0
28	13.0	24.0	72.0	86.0	0.0	0.0
29	8.5	19.2	76.0	93.0	0.0	0.0
30	8.5	20.2	91.0	95.0	0.0	0.2
31	11.5	15.2	75.0	95.0	0.0	0.0
01.01.17	12.2	19.5	75.0	93.0	0.0	1.1
2	9.5	21.0	65.0	90.0	0.0	0.7
3	11.0	23.5	59.0	93.0	0.0	1.3
4	13.2	22.5	62.0	95.0	0.0	3.6
5	13.0	20.5	76.0	93.0	0.0	0.4
6	9.0	17.5	78.0	95.0	0.0	0.0
7	8.5	17.0	74.0	92.0	0.0	0.0
8	9.0	18.5	49.0	93.0	0.0	1.7
9	9.0	22.5	63.0	92.0	0.0	4.2
10	11.5	24.0	65.0	93.0	0.0	2.0
11	10.0	23.5	53.0	90.0	0.0	1.8
12	3.6	22.0	33.0	94.0	0.0	7.8
13	1.5	21.8	42.0	94.0	0.0	8.8
14	2.5	19.2	42.0	97.0	0.0	8.3
15	3.8	19.5	62.0	91.0	0.0	8.2
16	5.0	21.5	55.0	91.0	0.0	7.3
17	6.8	23.0	59.0	91.0	0.0	6.8
18	7.5	24.0	53.0	94.0	0.0	6.7
19	6.0	24.0	95.0	97.0	0.0	6.4
20	7.8	25.2	45.0	95.0	0.0	9.0
21	6.5	25.0	55.0	94.0	0.0	9.3
22	7.5	23.8	64.0	92.0	0.0	8.8
23	10.0	24.5	66.0	90.0	0.0	7.3
24	9.5	24.5	66.0	92.0	0.0	6.3
25	10.0	25.8	63.0	97.0	0.0	6.7
26	9.5	26.5	62.0	92.0	0.0	6.5
27	14.2	27.0	78.0	91.0	0.0	6.7
28	13.5	23.0	66.0	91.0	0.0	2.3
29	10.0	22.5	60.0	90.0	0.0	6.5
30	10.8	23.0	65.0	97.0	0.0	7.6
31	7.5	19.5	77.0	92.0	0.0	2.9
01.02.17	11.0	18.8	81.0	90.0	0.0	1.4
2	9.0	17.0	85.0	95.0	0.0	0.0
3	10.0	17.5	70.0	95.0	0.0	0.5
4	9.5	22.5	62.0	93.0	0.0	4.8
5	9.0	25.5	62.0	95.0	0.0	5.5
6	10.0	28.2	62.0	95.0	0.0	7.0
7	13.5	28.0	43.0	93.0	0.0	7.6
8	10.0	25.5	61.0	88.0	0.0	9.3
9	10.0	24.5	57.0	95.0	0.0	9.3
10	11.5	25.5	51.0	95.0	0.0	8.5
11	7.5	25.5	58.0	94.0	0.0	9.0
12	9.8	25.0	58.0	88.0	0.0	10.0
13	10.5	26.0	53.0	88.0	0.0	8.2
14	11.5	27.2	54.0	86.0	0.0	8.3

15	10.5	27.5	56.0	90.0	0.0	8.0
16	10.5	27.0	59.0	88.0	0.0	7.0
17	10.0	26.2	62.0	95.0	0.0	7.4
18	11.5	27.2	60.0	93.0	0.0	7.3
19	12.5	28.6	57.0	91.0	0.0	6.6
20	15.2	29.0	72.0	94.0	0.0	4.5
21	15.0	28.5	56.0	94.0	0.0	1.1
22	15.5	32.0	42.0	86.0	0.0	8.6
23	11.5	30.0	54.0	80.0	0.0	9.5
24	10.0	27.5	42.0	81.0	0.0	9.9
25	9.0	26.0	49.0	83.0	0.0	10.0
26	10.0	26.5	55.0	81.0	0.0	9.3
27	10.5	27.0	49.0	85.0	0.0	9.2
28	10.5	28.2	51.0	83.0	0.0	9.1
01.03.17	12.5	29.0	54.0	91.0	0.0	9.3
2	13.5	30.0	50.0	87.0	0.0	9.0
3	16.5	31.5	43.0	82.0	0.0	9.0
4	14.5	32.0	46.0	80.0	0.0	7.3
5	14.5	31.5	34.0	87.0	0.0	8.8
6	12.5	30.5	44.0	80.0	0.0	9.7
7	10.0	29.2	41.0	75.0	0.0	10.2
8	11.6	29.5	51.0	86.0	0.0	9.8
9	15.5	30.0	57.0	80.0	0.0	9.6
10	15.0	30.2	69.0	90.0	0.0	5.5
11	16.1	28.5	70.0	96.0	9.6	5.6
12	15.8	24.5	46.0	94.0	1.0	6.0
13	10.0	26.2	42.0	81.0	0.0	7.7
14	9.0	26.0	44.0	81.0	0.0	10.2
15	10.0	28.0	36.0	79.0	0.0	10.2
16	11.0	28.0	32.0	81.0	0.0	9.3
17	13.0	30.0	52.0	86.0	0.0	10.2
18	154.0	31.0	45.0	87.0	0.0	6.8
19	14.0	30.0	71.0	89.0	0.0	9.8
20	13.5	25.6	50.0	91.0	0.0	0.2
21	14.0	29.2	59.0	87.0	0.0	7.0
22	17.1	28.0	59.0	88.0	0.0	8.7
23	19.0	29.5	62.0	89.0	0.0	6.8
24	19.5	31.0	58.0	91.0	0.0	6.6
25	19.6	32.2	54.0	80.0	0.0	6.7
26	20.0	32.0	67.0	86.0	0.0	7.8
27	20.2	30.3	63.0	89.0	0.0	3.5
28	22.5	32.5	60.0	85.0	0.0	3.7
29	22.5	32.2	89.0	88.0	0.0	5.1
30	21.5	30.5	63.0	89.0	0.0	0.0
31	22.0	33.0	70.0	89.0	0.0	5.8

#### FAIZABAD

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
01.11.16	14.5	30.5	36.0	96.0	0.0	4.9
2	14.0	31.0	35.0	98.0	0.0	3.0
3	14.0	31.5	35.0	96.0	0.0	4.6
4	14.5	30.5	34.0	93.0	0.0	3.0
5	14.0	31.5	36.0	96.0	0.0	3.8
6	14.0	29.5	44.0	98.0	0.0	1.0
7	12.0	28.5	43.0	93.0	0.0	1.4
8	11.5	29.5	41.0	95.0	0.0	1.3
9	11.5	29.0	43.0	93.0	0.0	1.0

10	13.0	30.4	34.0	95.0	0.0	1.4
11	13.0	29.5	35.0	96.0	0.0	1.0
12	12.5	30.0	43.0	93.0	0.0	2.4
13	12.0	30.0	36.0	96.0	0.0	1.4
14	13.5	31.0	43.0	96.0	0.0	1.0
15	17.7	33.0	40.0	93.0	0.0	2.4
16	11.5	28.2	34.0	95.0	0.0	1.8
17	11.0	27.5	37.0	98.0	0.0	1.9
18	10.5	26.5	48.0	93.0	0.0	1.5
19	11.0	26.5	48.0	95.0	0.0	2.2
20	11.0	26.8	48.0	91.0	0.0	3.0
21	11.0	27.0	45.0	93.0	0.0	2.2
22	11.5	28.5	37.0	91.0	0.0	2.9
23	11.0	28.5	42.0	93.0	0.0	1.4
24	11.5	27.0	47.0	93.0	0.0	2.8
25	11.0	27.5	30.0	91.0	0.0	2.6
26	10.5	26.5	49.0	90.0	0.0	3.4
27	10.5	26.5	54.0	97.0	0.0	0.0
28	11.5	25.5	57.0	95.0	0.0	1.0
29	12.5	25.0	71.0	98.0	0.0	0.0
30	13.0	26.0	70.0	97.0	0.0	0.8
01.12.16	13.5	25.5	73.0	100.0	0.0	1.0
2	14.0	24.0	71.0	98.0	0.0	1.9
3	12.0	21.0	82.0	98.0	0.0	1.6
4	13.5	18.5	86.0	96.0	0.0	1.2
5	12.5	19.0	74.0	100.0	0.0	1.6
6	11.0	17.5	80.0	98.0	0.0	0.0
7	12.0	21.0	85.0	95.0	0.0	0.0
8	10.5	15.0	89.0	97.0	0.0	1.8
9	11.0	20.5	64.0	90.0	0.0	0.0
10	9.5	14.5	91.0	100.0	0.0	1.0
11	10.5	19.0	72.0	97.0	0.0	0.0
12	9.5	14.5	95.0	100.0	0.0	1.0
13	9.5	20.5	74.0	97.0	0.0	1.0
14	8.5	24.0	67.0	100.0	0.0	1.1
15	7.5	23.5	62.0	100.0	0.0	2.0
16	8.5	21.5	62.0	100.0	0.0	1.6
17	7.0	23.5	52.0	100.0	0.0	1.4
18	7.0	25.0	47.0	92.0	0.0	2.0
19	8.0	24.5	39.0	95.0	0.0	2.5
20	8.0	23.0	60.0	92.0	0.0	3.2
21	8.0	22.0	53.0	95.0	0.0	2.8
22	7.0	22.0	66.0	100.0	0.0	1.6
23	8.0	24.0	54.0	95.0	0.0	2.6
24	8.5	25.5	46.0	97.0	0.0	3.0
25	9.0	25.0	62.0	91.0	0.0	3.8
26	10.5	18.0	88.0	98.0	0.0	3.6
27	10.0	21.5	62.0	97.0	0.0	0.0
28	9.5	21.5	77.0	100.0	0.0	2.0
29	10.5	16.0	79.0	90.0	0.0	0.0
30	7.5	16.5	77.0	97.0	0.0	0.0
31	9.0	15.2	85.0	100.0	0.0	0.0
01.01.17	8.0	15.2	89.0	97.0	0.0	0.0
2	13.5	18.0	84.0	97.0	0.0	0.0
3	9.0	21.0	70.0	100.0	0.0	1.0
4	10.5	20.0	72.0	97.0	0.0	2.0
5	9.0	20.5	71.0	100.0	0.0	1.8
6	10.0	15.0	80.0	100.0	0.0	1.2
7	11.5	17.5	80.0	98.0	0.0	0.0

8	10.0	30.0	59.0	95.0	0.0	0.0
9	7.5	24.0	49.0	95.0	0.0	1.8
10	8.0	22.5	43.0	93.0	0.0	3.0
11	4.0	19.0	30.0	86.0	0.0	2.8
12	2.0	18.0	35.0	79.0	0.0	2.0
13	1.5	17.5	43.0	84.0	0.0	2.8
14	1.7	20.5	46.0	92.0	0.0	3.4
15	4.0	23.2	38.0	88.0	0.0	2.0
16	4.5	24.0	41.0	86.0	0.0	3.4
17	7.5	23.0	43.0	97.0	0.0	3.0
18	7.5	21.0	49.0	100.0	0.0	2.4
19	6.0	20.5	56.0	97.0	0.0	2.0
20	6.5	23.7	33.0	90.0	0.0	1.4
21	5.5	23.0	38.0	97.0	0.0	3.6
22	6.0	22.7	50.0	95.0	0.0	2.0
23	10.0	25.5	45.0	86.0	0.0	2.2
24	8.5	26.0	42.0	95.0	0.0	3.6
25	8.0	26.0	47.0	97.0	0.0	2.0
26	8.5	25.8	55.0	97.0	0.0	2.4
27	14.0	28.2	92.0	100.0	6.8	2.4
28	9.0	21.0	68.0	95.0	10.0	0.0
29	10.0	19.5	66.0	97.0	0.0	2.0
30	7.0	21.0	65.0	100.0	0.0	1.2
31	8.0	22.5	64.0	100.0	0.0	2.0
01.02.17	7.0	23.0	65.0	100.0	0.0	4.0
2	10.0	20.8	68.0	98.0	0.0	2.6
3	7.0	24.0	53.0	100.0	0.0	2.8
4	8.5	25.0	53.0	95.0	0.0	4.7
5	9.5	26.0	52.0	92.0	0.0	4.8
6	11.0	26.5	53.0	95.0	0.0	7.3
7	10.7	23.0	38.0	88.0	0.0	6.5
8	7.5	24.0	45.0	91.0	0.0	5.0
9	7.0	25.0	45.0	97.0	0.0	4.2
10	8.0	23.0	38.0	94.0	0.0	4.5
11	5.5	24.0	46.0	97.0	0.0	4.2
12	9.0	24.0	46.0	90.0	0.0	5.6
13	10.0	26.0	49.0	95.0	0.0	3.6
14	10.0	25.0	45.0	95.0	0.0	6.6
15	8.0	25.5	47.0	93.0	0.0	5.0
16	9.5	26.0	56.0	97.0	0.0	5.8
17	11.0	27.5	41.0	95.0	0.0	6.2
18	12.0	29.0	40.0	96.0	0.0	6.0
19	13.5	28.3	52.0	95.0	0.0	7.0
20	13.0	30.0	46.0	95.0	0.0	6.2
21	14.5	31.5	35.0	93.0	0.0	7.0
22	10.0	27.0	32.0	95.0	0.0	7.6
23	8.0	25.8	30.0	93.0	0.0	4.0
24	9.0	25.5	36.0	95.0	0.0	2.4
25	10.0	26.0	29.0	70.0	0.0	3.4
26	9.5	26.7	36.0	86.0	0.0	4.5
27	9.0	27.0	30.0	93.0	0.0	4.4
28	9.0	27.2	29.0	74.0	0.0	5.8

#### HASSAN

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min.	Max.	Min.	Max.	
01.01.16	13.8	30.7	21.7	21.7	0.0

2	12.9	28.4	33.4	33.4	0.0
3	11.8	29.3	22.1	22.1	0.0
4	12.3	29.7	24.8	24.8	0.0
5	14.2	29.5	25.9	25.9	0.0
6	13.3	28.8	29.1	29.1	0.0
7	14.6	29.6	32.2	32.2	0.0
8	16.5	29.2	41.7	41.7	0.0
9	12.7	28.3	46.7	46.7	0.0
10	14.8	29.1	26.7	26.7	0.0
11	13.2	30.2	27.4	27.4	0.0
12	13.5	29.3	27.1	27.1	0.0
13	14.5	30.3	31.5	31.5	0.0
14	13.0	30.2	30.3	30.3	0.0
15	14.8	30.5	29.9	29.9	0.0
16	13.7	29.2	41.7	41.7	0.0
17	13.2	29.7	41.1	41.1	0.0
18	15.0	29.8	38.2	38.2	0.0
19	20.6	30.9	41.9	41.9	0.0
20	19.5	28.9	54.5	54.5	0.3
21	17.9	29.6	51.1	51.1	0.3
22	19.5	31.3	41.3	41.3	0.0
23	18.5	30.4	40.5	40.5	0.0
24	18.3	29.5	52.3	52.3	0.0
25	17.9	31.5	46.1	46.1	0.0
26	16.9	33.6	36.7	36.7	0.0
27	15.3	32.4	36.7	36.7	0.0
28	17.9	33.5	30.9	30.9	0.0
29	16.0	32.4	32.1	32.1	0.0
30	16.2	32.9	31.3	31.3	0.0
31	15.3	31.7	29.2	29.2	0.0
01.02.16	13.6	32.5	19.0	62.8	0.0
2	12.5	32.5	15.1	68.8	0.0
3	13.6	33.3	15.4	61.8	0.0
4	13.9	32.6	19.2	71.0	0.0
5	13.6	34.2	22.1	67.8	0.0
6	13.7	31.5	21.8	79.2	0.0
7	18.9	32.1	28.6	82.8	0.0
8	18.2	32.5	41.0	80.2	0.0
9	20.1	33.1	36.5	82.0	0.0
10	20.5	32.5	39.7	84.6	0.0
11	20.6	33.0	32.7	93.4	0.1
12	20.9	32.8	41.5	84.3	0.0
13	19.2	33.7	36.2	84.8	0.0
14	18.0	32.2	36.8	83.0	0.0
15	15.4	32.3	30.6	81.0	0.0
16	16.1	32.5	21.2	81.8	0.0
17	17.0	32.7	28.0	76.8	0.0
18	19.9	32.7	25.9	78.6	0.0
19	16.3	30.9	36.0	76.7	0.0
20	17.7	32.6	32.1	76.8	0.0
21	18.8	33.8	30.6	84.9	0.0
22	18.3	35.1	27.5	85.5	0.0
23	17.5	36.0	22.1	86.6	0.0
24	22.0	36.3	18.5	82.2	0.0
25	21.1	35.3	37.8	84.1	0.2
26	20.0	34.9	34.1	83.9	0.0
27	18.6	33.8	35.4	88.0	0.0
28	17.7	33.6	29.0	84.6	0.0
29	19.4	32.8	31.8	75.5	0.0

01.03.16	17.7	33.5	30.1	80.3	0.0
2	19.1	33.0	29.1	74.5	0.0
3	17.8	32.5	30.9	73.9	0.0
4	18.4	33.7	27.7	71.2	0.0
5	16.9	33.9	20.8	60.3	0.0
6	19.3	33.8	23.7	86.8	0.0
7	19.4	35.8	22.3	87.3	0.0
8	21.0	35.2	21.9	87.3	0.0
9	21.1	36.2	20.4	87.3	0.0
10	21.2	37.1	24.1	84.9	0.0
11	20.5	36.6	22.4	85.3	0.0
12	20.6	36.8	20.8	82.7	0.0
13	21.7	37.2	26.8	81.7	0.0
14	22.8	36.8	33.7	72.4	0.4
15	20.6	36.4	26.6	75.5	0.0
16	18.2	35.5	31.3	75.2	0.0
17	20.7	35.7	31.3	74.0	0.0
18	21.3	36.9	30.1	79.3	0.3
19	22.6	36.6	28.8	82.9	0.0
20	21.6	37.1	28.1	83.2	0.0
21	22.5	37.0	28.4	85.8	0.0
22	22.5	37.9	22.0	83.7	0.0
23	22.4	37.9	21.0	82.3	0.0
24	23.3	37.1	24.8	83.7	0.0
25	22.0	36.3	27.0	82.8	0.0
26	21.0	36.8	22.6	86.2	0.0
27	19.0	36.1	20.6	86.0	0.0
28	19.1	37.2	12.3	78.5	0.0
29	19.6	36.6	15.6	84.8	0.0
30	19.7	36.6	22.2	83.8	0.0
31	21.9	36.0	27.4	83.2	0.1
01.04.16	21.2	36.2	30.9	83.0	8.5
2	23.0	35.5	34.4	84.7	1.6
3	22.1	36.1	25.6	83.3	0.0
4	22.5	36.0	30.1	87.2	0.1
5	22.8	36.5	26.2	83.1	0.0
6	22.4	36.7	27.3	81.4	0.1
7	23.2	35.6	31.4	81.7	0.4
8	24.0	36.9	26.9	81.4	0.0
9	23.8	37.6	33.2	80.9	2.9
10	22.3	35.0	43.1	82.7	0.3
11	22.2	35.8	38.0	84.0	4.0
12	23.7	36.8	34.0	84.3	0.0
13	24.8	38.6	27.0	80.9	0.0
14	24.0	37.4	28.5	82.4	0.0
15	23.4	38.8	19.6	92.3	0.6
16	19.9	38.3	26.7	100.0	21.6
17	23.9	36.7	36.7	83.1	2.5
18	22.1	37.5	31.4	84.0	0.2
19	23.3	37.5	28.4	83.6	0.0
20	22.6	37.9	28.9	74.9	0.0
21	22.6	38.0	30.6	80.7	0.1
22	22.7	36.9	38.1	77.6	0.0
23	23.0	37.1	30.9	80.2	0.0
24	21.3	38.2	17.7	84.1	0.0
25	20.6	38.5	20.8	82.4	0.0
26	21.3	37.8	18.7	98.2	0.0
27	22.1	37.9	22.8	99.0	0.0
28	22.6	39.0	17.3	84.5	0.0

29	22.4	38.2	24.5	80.6	0.0
30	22.5	38.1	21.2	74.4	0.0
01.05.16	22.2	37.7	23.0	80.4	0.0
2	23.3	38.9	26.5	79.1	0.0
3	22.6	37.9	27.4	83.4	0.0
4	22.6	36.6	34.7	83.9	3.7
5	22.1	35.6	40.2	86.1	8.3
6	22.2	36.0	42.7	83.3	4.3
7	22.7	33.9	47.1	86.2	5.0
8	23.4	37.5	27.2	84.6	0.1
9	21.4	35.4	35.0	80.5	0.0
10	23.7	36.7	26.9	76.8	0.0
11	21.7	36.2	28.5	80.6	6.5
12	21.9	34.3	44.4	83.8	17.2
13	22.2	33.7	47.2	85.9	19.6
14	23.8	34.9	43.9	84.5	2.4
15	22.2	34.9	47.2	80.0	4.5
16	23.6	33.7	52.1	86.9	3.7
17	23.1	32.4	59.8	83.7	0.0
18	22.0	32.2	55.9	82.3	7.2
19	23.8	29.0	69.6	82.8	0.0
20	23.4	30.5	67.1	81.4	0.0
21	22.9	30.8	62.5	81.7	0.0
22	22.8	32.0	54.1	81.6	0.0
23	22.9	33.8	48.9	81.2	0.0
24	22.4	34.1	48.6	82.6	0.0
25	22.8	34.6	46.4	83.6	0.0
26	22.0	32.8	50.3	82.3	0.0
27	23.2	33.5	50.5	81.7	0.0
28	22.3	33.9	49.0	85.1	10.6
29	22.8	33.0	56.8	83.5	1.9
30	22.5	30.6	60.8	84.4	0.7
31	22.0	32.6	52.7	84.4	11.5
01.06.16	21.1	28.7	65.6	98.0	0.0
2	21.5	28.7	65.7	97.9	0.0
3	22.1	31.2	58.0	97.6	9.9
4	21.6	31.5	44.1	97.9	0.0
5	21.2	29.9	61.6	98.3	0.0
6	21.3	30.6	54.1	96.9	0.0
7	20.8	31.6	51.1	99.0	0.0
8	21.4	30.6	57.6	99.4	9.6
9	21.1	27.0	73.7	100.0	8.8
10	20.8	27.6	72.0	100.0	1.8
11	20.5	28.2	65.1	100.0	2.0
12	20.0	28.5	63.9	100.0	0.5
13	20.3	26.8	68.0	99.3	0.0
14	20.2	28.4	55.0	98.5	0.0
15	20.4	28.5	62.0	96.9	0.0
16	20.0	29.2	56.2	99.2	0.0
17	19.5	29.0	59.0	97.6	0.0
18	20.3	29.6	54.4	95.5	0.0
19	20.0	28.1	61.3	98.9	0.0
20	19.5	28.9	62.2	98.3	0.0
21	20.7	26.6	69.1	95.7	0.0
22	19.9	27.7	57.3	96.2	0.3
23	19.7	24.1	78.8	99.2	1.3
24	19.2	27.4	59.1	97.2	0.3
25	19.5	25.9	67.2	98.2	0.8
26	19.1	27.4	62.7	97.9	0.0



27	20.6	24.6	85.3	99.8	6.8
28	20.6	24.3	86.8	99.6	3.8
29	20.3	23.4	90.3	100.0	12.6
30	21.0	24.2	86.0	99.6	2.8
01.07.16	20.9	25.4	78.5	99.7	6.8
2	21.2	25.5	81.6	98.7	3.3
3	20.3	25.6	80.7	100.0	3.5
4	20.8	24.7	88.1	100.0	5.5
5	20.5	24.4	85.7	100.0	0.8
6	20.3	25.5	81.2	100.0	3.8
7	19.6	26.1	77.5	100.0	0.8
8	20.8	25.4	79.9	100.0	4.0
9	20.3	24.9	80.6	99.2	1.8
10	20.1	25.4	77.6	99.9	2.3
11	19.9	24.6	79.3	100.0	2.3
12	20.3	25.4	74.3	100.0	4.0
13	19.9	25.4	77.7	100.0	2.8
14	19.3	27.9	68.5	100.0	0.0
15	20.0	29.5	60.5	100.0	0.0
16	20.0	28.9	60.1	97.0	0.0
17	20.4	27.9	63.3	98.3	0.0
18	19.6	27.6	64.9	99.5	0.0
19	19.4	28.4	55.9	96.6	0.0
20	20.0	26.9	67.5	97.1	2.8
21	19.1	27.2	66.9	98.6	0.5
22	19.6	24.6	75.0	97.0	0.8
23	18.6	26.4	71.3	100.0	13.1
24	18.9	26.3	77.0	100.0	5.1
25	19.6	28.3	65.4	100.0	0.3
26	20.0	29.3	61.5	100.0	0.0
27	20.3	29.9	56.3	100.0	0.8
28	19.8	28.3	66.0	100.0	37.0
29	19.8	26.2	72.0	100.0	3.5
30	19.7	25.5	75.7	100.0	3.0
31	19.3	26.7	67.5	99.5	0.0
01.08.16	19.5	25.4	75.3	97.1	0.3
2	19.0	25.9	66.6	98.1	0.8
3	19.7	24.7	77.1	99.7	3.5
4	19.7	25.4	73.1	97.6	0.0
5	19.5	26.3	70.6	100.0	0.8
6	20.2	25.9	73.7	99.8	1.5
7	20.0	26.3	70.7	100.0	0.8
8	19.4	29.1	58.7	100.0	0.0
9	20.0	27.1	66.0	99.8	0.3
10	19.9	28.2	62.4	99.3	0.0
11	19.6	27.8	64.8	99.9	0.0
12	19.4	28.5	64.3	100.0	0.0
13	20.2	28.0	62.1	99.8	0.0
14	20.0	27.7	59.3	98.8	0.0
15	19.7	27.9	60.3	98.6	0.0
16	20.2	25.9	70.5	97.1	0.5
17	20.2	26.8	67.2	96.9	0.0
18	20.3	26.8	68.3	97.9	5.3
19	20.0	29.2	57.7	100.0	0.3
20	18.8	29.7	51.9	100.0	0.0
21	19.2	29.9	56.0	99.0	0.3
22	20.1	28.9	60.2	97.5	0.0
23	19.8	28.7	57.1	98.8	0.0
24	20.5	28.9	56.8	95.6	0.0

25	20.1	28.5	62.6	98.3	0.3
26	20.1	30.2	54.9	98.8	0.0
27	20.1	29.4	56.9	96.3	0.0
28	20.0	27.0	66.3	96.8	0.0
29	20.6	29.2	57.9	94.2	0.0
30	20.5	28.7	61.7	97.3	12.7
31	20.2	25.8	78.3	97.5	0.3
01.09.16	20.1	26.7	66.8	99.6	0.3
2	19.7	25.2	76.7	99.1	0.0
3	19.8	28.2	62.7	98.1	0.0
4	19.7	27.1	65.1	99.3	1.0
5	18.4	27.6	63.3	98.7	19.8
6	18.8	25.5	73.1	99.3	1.0
7	18.2	27.8	55.6	99.4	0.3
8	17.1	27.5	54.9	100.0	0.0
9	17.6	29.0	51.7	100.0	0.0
10	18.0	29.6	53.9	100.0	1.8
11	18.5	28.9	52.0	99.2	0.3
12	19.3	27.8	52.4	100.0	54.6
13	18.9	28.7	60.7	100.0	4.8
14	18.9	27.8	63.9	99.9	5.3
15	19.8	28.6	62.9	98.3	2.3
16	20.0	26.6	68.6	99.9	0.3
17	19.3	27.5	61.3	98.5	0.0
18	18.0	28.0	57.2	100.0	0.0
19	18.7	28.4	50.2	99.4	0.0
20	18.2	27.9	55.5	98.7	0.0
21	20.2	28.5	55.1	94.2	0.0
22	19.9	27.1	65.5	97.7	0.5
23	19.8	25.3	69.6	95.2	0.5
24	20.2	25.6	69.0	98.2	0.3
25	20.3	26.8	67.9	97.3	5.8
26	20.5	28.9	63.7	100.0	3.8
27	19.0	29.0	64.5	100.0	2.3
28	20.5	29.0	62.9	99.4	1.8
29	20.8	28.3	64.2	99.4	0.0
30	19.2	29.1	54.3	98.1	0.0
01.10.16	18.5	29.5	46.8	98.6	0.0
2	18.2	29.6	51.2	100.0	0.0
3	18.4	30.6	48.2	100.0	0.0
4	18.3	29.6	47.6	99.7	0.0
5	17.4	30.2	47.1	100.0	0.0
6	17.2	29.3	48.5	100.0	0.3
7	15.3	30.1	43.6	100.0	0.0
8	18.4	28.1	57.2	99.5	0.0
9	18.1	28.1	60.4	98.5	0.0
10	19.3	28.8	56.3	96.9	0.0
11	20.0	29.2	56.5	94.1	0.0
12	21.2	27.7	63.9	98.6	2.3
13	20.2	26.0	60.5	99.1	3.3
14	18.2	29.6	46.1	100.0	0.0
15	17.0	31.2	32.9	89.4	0.0
16	15.9	31.2	31.1	93.0	0.0
17	16.1	30.7	33.2	88.6	0.0
18	15.7	31.1	32.1	97.3	0.0
19	16.9	31.1	33.7	92.4	0.0
20	16.8	31.2	31.9	98.5	0.0
21	17.0	30.6	30.8	98.9	0.0
22	17.0	30.7	33.1	100.0	0.3

23	16.1	30.1	33.7	100.0	0.0
24	17.4	29.8	39.4	100.0	0.0
25	18.4	30.3	36.3	100.0	0.0
26	18.3	30.3	32.7	100.0	0.0
27	16.5	30.6	32.1	81.9	0.0
28	17.4	31.3	28.3	93.4	0.0
29	17.9	31.4	31.2	100.0	0.0
30	18.4	30.8	44.5	97.5	0.0
31	20.6	30.3	43.0	93.8	0.0
01.11.16	20.8	30.1	50.8	99.4	2.0
2	19.4	28.8	45.9	98.4	0.5
3	18.6	30.6	38.5	99.5	0.3
4	18.3	31.4	39.1	99.5	0.0
5	16.4	30.6	30.5	99.0	0.0
6	14.7	30.8	31.2	93.7	0.0
7	14.5	30.6	31.1	86.9	0.0
8	14.7	30.4	25.0	89.5	0.0
9	13.3	29.1	23.7	91.9	0.0
10	13.1	30.5	26.9	81.6	0.0
11	14.2	30.0	34.5	88.0	0.0
12	15.9	30.2	38.2	87.6	0.0
13	18.0	30.3	44.0	87.4	0.0
14	20.7	31.1	43.9	93.6	0.0
15	20.6	29.8	44.0	91.1	0.0
16	18.5	30.7	40.7	90.9	0.0
17	19.9	29.3	44.6	94.5	0.0
18	20.6	29.4	38.7	92.1	0.0
19	17.2	31.5	21.8	95.3	0.0
20	15.5	30.1	28.7	93.9	0.0
21	15.8	29.2	20.1	90.7	0.0
22	14.0	30.2	25.8	93.2	0.0
23	13.7	30.7	23.2	85.4	0.0
24	14.8	29.6	26.1	79.6	0.0
25	13.2	30.4	16.4	88.5	0.0
26	13.2	29.7	26.0	81.9	0.0
27	12.6	32.2	15.5	79.3	0.0
28	13.3	33.1	14.0	78.7	0.0
29	12.7	30.7	19.5	74.9	0.0
30	13.1	29.8	24.4	80.2	0.0
01.12.16	14.6	29.6	21.2	80.9	0.0
2	20.7	27.0	40.1	97.6	1.8
3	19.4	24.5	75.0	99.1	0.3
4	18.8	26.9	51.8	100.0	0.0
5	13.1	28.8	32.3	86.6	0.0
6	15.6	28.1	40.6	100.0	0.0
7	15.2	27.7	27.4	98.9	0.0
8	15.9	28.8	41.5	90.5	0.0
9	15.5	29.6	28.0	97.5	0.0
10	13.3	28.7	26.3	94.7	0.0
11	10.2	29.7	16.4	78.9	0.0
12	13.8	29.8	31.0	76.9	0.0
13	18.5	22.8	66.4	100.0	20.3
14	19.2	22.6	84.8	100.0	4.3
15	18.9	26.0	56.3	99.0	0.0
16	16.0	26.3	64.2	98.5	0.0
17	17.5	27.4	53.1	100.0	0.0
18	15.0	28.2	40.1	100.0	0.0
19	14.6	29.0	33.6	97.1	0.0
20	13.8	29.0	33.2	97.3	0.0

21	14.9	29.1	37.1	100.0	0.0
22	14.4	30.5	22.0	97.8	0.0
23	12.9	30.8	18.9	77.8	0.0
24	11.5	29.6	20.0	80.1	0.0
25	11.8	30.6	19.8	92.3	0.0
26	13.3	30.6	20.9	99.9	0.0
27	13.9	30.4	15.0	76.2	0.0
28	12.6	30.2	24.7	89.2	0.0
29	14.2	28.6	24.8	97.5	0.0
30	13.1	28.4	27.4	95.6	0.0
31	12.9	27.9	25.2	100.0	0.0

## HISAR

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
01.10.16	25.0	35.4	51.0	87.0	0.0	6.0
2	25.2	35.4	48.0	83.0	0.0	5.7
3	24.5	36.0	83.0	91.0	0.0	6.0
4	25.2	34.7	60.0	95.0	12.0	0.0
5	24.1	35.0	56.0	95.0	0.0	4.6
6	23.9	34.0	53.0	92.0	0.0	6.8
7	23.5	34.6	43.0	93.0	0.0	8.7
8	22.9	35.4	41.0	92.0	0.0	8.7
9	22.0	36.0	43.0	85.0	0.0	8.5
10	22.0	35.6	43.0	76.0	0.0	8.4
11	18.5	33.4	39.0	88.0	0.0	8.3
12	18.0	35.0	28.0	74.0	0.0	8.6
13	16.0	35.6	21.0	70.0	0.0	9.7
14	16.5	35.4	32.0	90.0	0.0	9.5
15	15.5	35.6	34.0	83.0	0.0	9.5
16	16.5	34.9	33.0	83.0	0.0	9.4
17	16.7	34.9	31.0	80.0	0.0	8.5
18	16.0	34.8	35.0	84.0	0.0	9.0
19	15.5	34.8	33.0	69.0	0.0	9.9
20	15.9	35.4	36.0	63.0	0.0	9.9
21	17.5	35.4	36.0	89.0	0.0	9.3
22	17.9	35.3	41.0	73.0	0.0	9.1
23	15.9	34.0	40.0	82.0	0.0	9.0
24	16.0	33.0	37.0	82.0	0.0	6.4
25	17.7	33.9	45.0	81.0	0.0	8.6
26	16.0	33.2	38.0	88.0	0.0	9.0
27	14.0	34.0	42.0	98.0	0.0	8.4
28	12.9	32.7	43.0	89.0	0.0	6.1
29	13.0	33.0	43.0	85.0	0.0	8.5
30	13.3	33.0	42.0	78.0	0.0	7.8
31	13.5	32.4	47.0	98.0	0.0	3.1
01.11.16	13.9	31.0	14.2	12.4	0.0	5.0
2	13.1	28.4	20.1	11.8	0.0	0.0
3	12.0	27.6	14.7	11.4	0.0	0.0
4	13.5	30.4	16.4	12.1	0.0	0.2
5	12.0	28.0	13.1	11.2	0.0	0.0
6	11.5	30.0	15.3	10.5	0.0	0.0
7	11.0	30.6	14.8	10.2	0.0	1.9
8	9.5	28.4	14.6	9.8	0.0	1.0
9	9.0	29.6	12.9	9.0	0.0	6.2
10	10.2	31.9	13.7	10.5	0.0	8.4
11	11.5	32.0	14.2	10.2	0.0	7.5

12	15.9	32.0	14.1	11.8	0.0	8.5
13	13.5	31.4	14.8	11.7	0.0	6.9
14	11.5	28.6	13.3	10.9	0.0	4.7
15	9.9	27.0	13.0	10.0	0.0	5.2
16	9.0	27.0	13.0	8.7	0.0	4.4
17	8.0	27.5	13.3	9.0	0.0	6.8
18	9.0	27.2	13.5	8.9	0.0	7.8
19	8.9	27.4	12.4	8.1	0.0	8.1
20	11.8	28.8	13.5	10.4	0.0	8.7
21	10.8	30.4	13.6	10.4	0.0	8.7
22	9.5	30.8	15.7	9.5	0.0	9.0
23	10.2	30.8	14.5	9.8	0.0	8.8
24	9.6	27.9	14.0	9.7	0.0	6.1
25	8.7	27.4	16.2	8.6	0.0	6.6
26	9.6	29.2	12.1	8.5	0.0	8.7
27	9.9	29.4	12.1	9.5	0.0	8.4
28	9.0	29.4	10.3	9.0	0.0	8.7
29	6.9	28.6	16.1	8.3	0.0	9.2
30	9.5	29.4	12.9	9.6	0.0	8.7
01.12.16	9.5	28.0	72.0	100.0	0.0	6.7
2	9.5	24.4	54.0	100.0	0.0	4.0
3	6.5	25.4	55.0	92.0	0.0	5.3
4	7.0	26.2	42.0	92.0	0.0	8.8
5	6.5	26.9	44.0	89.0	0.0	8.6
6	8.0	26.4	47.0	92.0	0.0	8.6
7	6.7	27.1	55.0	100.0	0.0	7.5
8	9.0	26.0	61.0	100.0	0.0	6.3
9	8.0	25.2	52.0	100.0	0.0	5.9
10	12.0	28.6	57.0	89.0	0.0	6.5
11	10.7	25.0	59.0	100.0	0.0	5.7
12	10.0	26.2	52.0	100.0	0.0	7.0
13	10.0	24.4	56.0	100.0	0.0	2.9
14	9.9	23.6	57.0	100.0	0.0	5.1
15	6.5	21.4	48.0	97.0	0.0	5.4
16	5.1	23.9	46.0	97.0	0.0	7.8
17	5.6	23.9	47.0	97.0	0.0	8.3
18	4.5	23.0	48.0	94.0	0.0	6.7
19	4.0	22.4	63.0	100.0	0.0	6.5
20	6.7	22.5	43.0	100.0	0.0	6.3
21	5.5	24.0	45.0	97.0	0.0	7.0
22	5.5	25.0	54.0	97.0	0.0	8.5
23	5.0	25.4	56.0	100.0	0.0	8.2
24	6.0	26.4	70.0	100.0	0.0	7.5
25	9.0	22.4	87.0	100.0	0.0	4.7
26	8.0	17.2	74.0	100.0	0.0	0.0
27	4.5	19.9	54.0	100.0	0.0	4.3
28	6.0	22.6	48.0	100.0	0.0	7.2
29	7.5	24.9	73.0	90.0	0.0	7.9
30	10.5	23.4	77.0	100.0	0.0	4.4
31	10.0	18.4	76.0	100.0	0.0	0.0
01.01.17	10.0	20.0	76.0	100.0	0.0	1.2
2	9.0	20.0	77.0	100.0	0.0	1.0
3	9.3	20.9	78.0	100.0	0.0	5.0
4	8.0	21.9	68.0	100.0	0.0	3.4
5	9.7	23.5	80.0	100.0	0.0	6.1
6	11.0	18.9	98.0	100.0	0.0	3.6
7	12.0	15.7	80.0	100.0	5.8	0.0
8	11.0	18.0	76.0	97.0	0.0	1.1
9	5.0	16.8	67.0	100.0	0.0	0.9

10	2.5	17.9	52.0	100.0	0.0	6.3
11	1.0	17.4	67.0	100.0	0.0	8.8
12	1.1	16.3	52.0	100.0	0.0	7.9
13	0.1	17.5	53.0	96.0	0.0	8.5
14	1.5	19.0	51.0	97.0	0.0	8.5
15	4.0	16.4	56.0	85.0	0.0	0.9
16	8.9	20.4	77.0	94.0	0.8	5.2
17	1.8	13.0	74.0	94.0	0.0	3.1
18	1.2	14.9	70.0	100.0	0.0	3.6
19	5.5	17.0	70.0	100.0	0.0	5.6
20	2.3	17.4	57.0	100.0	0.0	7.0
21	3.5	19.0	61.0	100.0	0.0	4.9
22	10.2	18.4	81.0	100.0	3.6	1.7
23	6.5	20.2	66.0	100.0	0.0	5.6
24	8.3	22.6	71.0	100.0	0.0	7.5
25	13.0	21.4	75.0	91.0	0.0	4.2
26	14.7	23.4	100.0	100.0	9.5	0.9
27	12.5	16.2	80.0	100.0	21.5	0.0
28	7.5	17.6	93.0	100.0	0.0	1.5
29	7.0	13.8	74.0	100.0	0.0	0.0
30	7.0	20.0	70.0	100.0	0.0	6.2
31	7.9	21.5	66.0	100.0	0.0	7.9
01.02.17	6.4	21.1	57.0	100.0	0.0	7.0
2	6.3	21.9	56.0	100.0	0.0	6.4
3	6.6	21.9	53.0	100.0	0.0	5.0
4	13.4	24.0	70.0	89.0	0.0	7.0
5	14.9	21.6	74.0	90.0	0.0	0.0
6	8.1	24.0	46.0	92.0	0.0	5.6
7	4.6	19.9	47.0	83.0	0.0	9.1
8	7.5	19.8	49.0	100.0	0.0	7.6
9	5.0	22.2	55.0	100.0	0.0	8.4
10	5.5	21.4	49.0	97.0	0.0	8.1
11	3.5	22.4	52.0	89.0	0.0	9.7
12	3.7	23.0	43.0	94.0	0.0	9.4
13	4.0	22.4	45.0	86.0	0.0	8.9
14	5.5	23.4	46.0	91.0	0.0	8.3
15	8.0	25.0	40.0	90.0	0.0	7.6
16	9.0	25.6	54.0	90.0	0.0	8.6
17	10.7	25.9	51.0	91.0	0.0	5.7
18	11.0	26.4	35.0	91.0	0.0	6.2
19	12.5	28.9	33.0	96.0	0.0	6.8
20	14.6	30.0	48.0	89.0	0.0	7.0
21	11.5	28.9	49.0	93.0	0.0	7.4
22	7.3	25.2	35.0	97.0	0.0	8.6
23	4.7	25.0	31.0	83.0	0.0	9.5
24	6.5	24.9	34.0	86.0	0.0	10.0
25	6.3	24.8	29.0	87.0	0.0	9.8
26	6.5	26.9	29.0	89.0	0.0	9.8
27	6.5	26.4	31.0	89.0	0.0	9.5
28	9.3	28.5	43.0	90.0	0.0	9.5
01.03.17	13.0	27.0	43.0	93.0	0.0	6.8
2	10.3	27.6	45.0	95.0	0.0	9.3
3	7.4	26.9	34.0	97.0	0.0	9.0
4	5.0	25.0	36.0	89.0	0.0	6.1
5	7.0	25.0	34.0	87.0	0.0	10.2
6	6.5	26.0	30.0	89.0	0.0	9.6
7	8.4	27.6	41.0	91.0	0.0	8.4
8	14.9	25.4	63.0	89.0	1.3	4.4
9	12.5	24.6	52.0	89.0	1.6	6.1

10	11.0	25.9	53.0	89.0	1.6	7.0
11	7.9	24.6	45.0	88.0	3.0	7.5
12	7.5	23.6	43.0	95.0	0.0	7.7
13	4.9	21.9	44.0	88.0	0.0	9.8
14	5.5	23.4	37.0	86.0	0.0	9.5
15	6.3	24.9	32.0	90.0	0.0	7.8
16	9.3	27.9	43.0	97.0	0.0	9.0
17	8.5	26.9	41.0	91.0	0.0	5.2
18	9.5	26.9	39.0	84.0	0.0	9.1
19	12.5	28.9	40.0	89.0	0.0	8.9
20	11.0	28.2	32.0	95.0	0.0	9.0
21	12.1	30.0	30.0	89.0	0.0	9.2
22	13.8	33.3	31.0	94.0	0.0	9.7
23	15.5	35.8	36.0	92.0	0.0	9.4
24	17.6	35.1	33.0	83.0	0.0	8.3
25	13.0	32.8	34.0	88.0	0.0	9.9
26	14.5	32.6	34.0	86.0	0.0	9.9
27	16.3	34.0	32.0	68.0	0.0	10.1
28	16.0	36.9	30.0	96.0	0.0	9.6
29	17.1	37.8	36.0	91.0	0.0	9.3
30	17.5	36.4	28.0	90.0	0.0	9.7
31	18.5	37.4	27.0	89.0	0.0	9.7
01.04.17	16.9	39.0	25.0	75.0	0.0	9.2
2	17.0	38.4	27.0	84.0	0.0	9.1
3	17.5	37.6	28.0	67.0	0.0	10.1
4	18.5	38.2	36.0	63.0	0.0	9.8
5	20.0	34.0	44.0	65.0	0.0	3.9
6	22.0	33.9	22.0	67.0	0.0	7.0
7	16.3	34.0	16.0	54.0	0.0	0.0
8	11.0	34.0	19.0	73.0	0.0	8.3
9	10.7	33.4	17.0	62.0	0.0	10.5
10	11.0	32.8	18.0	64.0	0.0	10.6
11	12.9	34.4	18.0	63.0	0.0	10.2
12	14.5	37.8	16.0	62.0	0.0	10.1
13	14.7	39.9	14.0	47.0	0.0	10.5
14	16.4	40.4	14.0	57.0	0.0	9.7
15	17.8	41.6	13.0	61.0	0.0	10.2
16	17.2	41.6	12.0	50.0	0.0	10.5
17	21.5	42.4	14.0	47.0	0.0	9.9
18	19.7	42.5	15.0	56.0	0.0	9.8
19	21.4	43.4	18.0	48.0	0.0	9.8
20	23.0	43.4	20.0	37.0	0.0	10.2
21	28.9	44.0	25.0	35.0	0.0	9.7
22	28.0	43.2	29.0	44.0	1.0	9.1
23	20.7	39.9	28.0	43.0	0.0	6.0
24	21.5	38.6	22.0	61.0	0.0	7.2
25	17.3	37.0	24.0	68.0	0.0	9.9
26	19.0	37.9	21.0	61.0	0.0	9.1
27	21.5	38.4	23.0	46.0	0.0	9.4
28	22.5	38.9	24.0	43.0	0.0	9.2
29	22.5	39.0	24.0	54.0	0.0	4.5
30	24.5	38.9	25.0	54.0	0.0	7.2

#### JALANDHAR

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
14.10.16	17.0	32.0	61.0	84.0	0.0	5.3

15	17.0	32.0	61.0	75.0	0.0	5.3
16	-	-	-	-	-	-
17	17.0	32.0	59.0	75.0	0.0	5.3
18	17.0	30.0	59.0	85.0	0.0	5.3
19	16.0	30.0	59.0	75.0	0.0	5.3
20	17.0	30.0	61.0	75.0	0.0	5.3
21	18.0	31.0	61.0	75.0	0.0	5.3
22	17.0	31.0	61.0	83.0	0.0	5.3
23	-	-	-	-	-	-
24	16.0	31.0	59.0	83.0	0.0	5.3
25	16.0	30.0	59.0	84.0	0.0	5.3
26	15.0	30.0	59.0	75.0	0.0	5.3
27	15.0	30.0	59.0	83.0	0.0	5.3
28	14.0	31.0	59.0	83.0	0.0	5.3
29	-	-	-	-	-	-
30	15.0	30.0	59.0	83.0	0.0	5.3
31	-	-	-	-	-	-
01.11.16	14.0	28.0	57.0	73.0	0.0	4.0
2	14.0	28.0	57.0	73.0	0.0	5.0
3	13.0	28.0	57.0	74.0	0.0	5.0
4	13.0	28.0	57.0	81.0	0.0	4.3
5	13.0	28.0	64.0	81.0	0.0	4.0
6	-	-	-	-	-	-
7	12.0	27.0	63.0	81.0	0.0	5.3
8	12.0	27.0	56.0	80.0	0.0	5.3
9	12.0	27.0	56.0	73.0	0.0	5.0
10	-	-	-	-	-	-
11	-	-	-	-	-	-
12	-	-	-	-	-	-
13	-	-	-	-	-	-
14	-	-	-	-	-	-
15	10.0	25.0	54.0	72.0	0.0	5.0
16	10.0	25.0	54.0	81.0	0.0	5.0
17	10.0	25.0	53.0	79.0	0.0	5.3
18	10.0	24.0	59.0	78.0	0.0	5.3
19	10.0	24.0	54.0	79.0	0.0	5.3
20	-	-	-	-	-	-
21	10.0	25.0	56.0	80.0	0.0	5.0
22	11.0	27.0	56.0	81.0	0.0	5.3
23	11.0	27.0	54.0	81.0	0.0	1.3
24	10.0	25.0	54.0	79.0	0.0	4.0
25	10.0	25.0	54.0	80.0	0.0	5.3
26	11.0	25.0	54.0	72.0	0.0	5.3
27	-	-	-	-	-	-
28	8.0	25.0	54.0	69.0	0.0	6.0
29	8.0	25.0	54.0	78.0	0.0	4.3
30	9.0	25.0	59.0	78.0	0.0	4.0
01.12.16	9.0	24.0	52.0	80.0	0.0	-
2	7.0	23.0	59.0	78.0	0.0	-
3	7.0	24.0	53.0	78.0	0.0	5.3
4	-	-	-	-	-	-
5	8.0	24.0	50.0	88.0	0.0	5.3
6	8.0	22.0	50.0	88.0	0.0	5.0
7	8.0	27.0	50.0	88.0	0.0	5.3
8	8.0	22.0	62.0	76.0	0.0	-
9	8.0	18.0	53.0	87.0	0.0	-
10	-	-	-	-	-	-
11	-	-	-	-	-	-
12	8.0	10.0	53.0	87.0	0.0	-



13	-	-	-	-	0.0	3.3
14	8.0	21.0	53.0	87.0	0.0	-
15	6.0	18.0	62.0	87.0	0.0	3.3
16	6.0	18.0	54.0	87.0	0.0	4.3
17	4.0	19.0	56.0	87.0	0.0	5.3
18	-	-	-	-	-	-
19	6.0	20.0	57.0	88.0	0.0	5.3
20	4.0	21.0	57.0	87.0	0.0	5.3
21	3.0	21.0	50.0	87.0	0.0	5.0
22	3.0	22.0	58.0	87.0	0.0	5.3
23	5.0	22.0	50.0	87.0	0.0	5.3
24	5.0	22.0	50.0	87.0	0.0	530.0
25	-	-	-	-	-	-
26	5.0	22.0	54.0	86.0	0.0	5.0
27	5.0	19.0	57.0	87.0	0.0	5.3
28	5.0	21.0	56.0	87.0	0.0	5.3
29	5.0	20.0	56.0	87.0	0.0	5.3
30	5.0	19.0	56.0	87.0	0.0	5.3
31	6.0	20.0	56.0	87.0	0.0	5.0
01.01.17	-	-	-	-	-	-
2	6.0	22.0	6.0	87.0	0.0	5.3
3	8.0	22.0	8.0	89.0	0.0	5.3
4	7.0	19.0	7.0	88.0	0.0	-
5	10.0	18.0	10.0	89.0	0.0	-
6	11.0	19.0	11.0	88.0	0.0	-
7	10.0	14.0	10.0	88.0	0.0	-
8	-	-	-	-	-	-
9	3.0	18.0	3.0	86.0	0.0	-
10	1.0	17.0	1.0	86.0	0.0	-
11	3.0	17.0	3.0	86.0	0.0	-
12	1.0	16.0	1.0	86.0	0.0	-
13	1.0	16.0	1.0	86.0	0.0	-
14	-	-	-	-	-	-
15	-	-	-	-	-	-
16	3.0	18.0	3.0	87.0	8.8	-
17	4.0	14.0	4.0	86.0	0.0	-
18	5.0	12.0	5.0	86.0	0.0	-
19	5.0	12.0	5.0	85.0	0.0	6.3
20	3.0	16.0	3.0	85.0	0.0	6.3
21	3.0	16.0	3.0	86.0	0.0	5.0
22	-	-	-	-	-	-
23	7.0	20.0	7.0	86.0	0.0	6.3
24	8.0	18.0	8.0	87.0	0.0	-
25	9.0	18.0	9.0	87.0	0.0	-
26	-	-	-	-	-	-
27	10.0	15.0	10.0	88.0	37.9	-
28	10.0	18.0	10.0	87.0	0.0	5.3
29	-	-	-	-	-	-
30	9.0	18.0	9.0	88.0	0.0	5.0
31	7.0	19.0	9.0	87.0	0.0	5.3
01.02.17	-	-	-	-	-	-
2	-	-	-	-	-	-
3	-	-	-	-	-	-
4	-	-	-	-	-	-
5	-	-	-	-	-	-
6	7.0	20.0	53.0	88.0	0.0	4.0
7	7.0	18.0	54.0	87.0	0.0	4.3
8	8.0	19.0	54.0	87.0	0.0	5.3
9	6.0	19.0	54.0	87.0	0.0	5.3

10	-	-	-	-	-	-
11	-	-	-	-	-	-
12	-	-	-	-	-	-
13	5.0	19.0	50.0	87.0	0.0	3.0
14	4.0	22.0	50.0	88.0	0.0	3.0
15	5.0	22.0	53.0	78.0	0.0	4.3
16	12.0	24.0	53.0	80.0	0.0	4.3
17	12.0	24.0	53.0	80.0	0.0	4.3
18	13.0	24.0	54.0	72.0	0.0	3.3
19	-	-	-	-	-	-
20	13.0	25.0	53.0	81.0	0.0	5.3
21	10.0	24.0	53.0	78.0	0.0	6.3
22	7.0	24.0	50.0	78.0	0.0	7.0
23	7.0	22.0	60.0	78.0	0.0	6.0
24	-	-	-	-	-	-
25	7.0	23.0	50.0	78.0	0.0	6.3
26	7.0	25.0	55.0	78.0	0.0	7.0
27	7.0	26.0	60.0	78.0	0.0	3.0
28	7.0	26.0	60.0	78.0	0.0	3.0
01.03.17	9.0	23.0	53.0	79.0	0.0	6.3
2	10.0	23.0	53.0	72.0	0.0	6.3
3	9.0	24.0	53.0	70.0	0.0	6.3
4	8.0	24.0	53.0	69.0	0.0	6.3
5	-	-	-	-	-	-
6	6.0	24.0	54.0	63.0	0.0	530.0
7	12.0	25.0	52.0	69.0	0.0	4.3
08.03.2017	12.0	23.0	57.0	72.0	0.0	1.3

#### JORHAT

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
15.11.16	18.8	30.8	65.0	96.0	0.0	3.6
16	17.6	30.0	67.0	94.0	0.0	0.2
17	17.7	29.7	70.0	100.0	0.0	4.9
18	16.4	29.5	75.0	98.0	0.0	7.9
19	14.9	28.2	68.0	98.0	0.0	8.4
20	13.4	28.3	62.0	100.0	0.0	7.4
21	11.4	27.8	62.0	98.0	0.0	7.7
22	11.5	26.8	63.0	97.0	0.0	9.8
23	11.7	27.2	63.0	97.0	0.0	9.5
24	11.4	26.8	58.0	97.0	0.0	9.5
25	11.8	27.6	64.0	98.0	0.0	9.3
26	12.2	27.4	63.0	98.0	0.0	9.2
27	13.5	26.9	58.0	95.0	0.0	9.3
28	15.0	27.8	59.0	96.0	0.0	8.9
29	13.4	28.2	67.0	98.0	0.0	4.1
30	13.7	27.5	63.0	93.0	0.0	8.8
01.12.16	14.1	27.7	65.0	94.0	0.0	8.8
2	15.0	28.1	62.0	90.0	0.0	8.6
3	14.2	27.8	61.0	98.0	0.0	8.5
4	13.4	28.0	65.0	100.0	0.0	8.0
5	12.0	27.5	65.0	98.0	0.0	7.4
6	11.3	28.2	56.0	100.0	0.0	8.1
7	11.4	27.3	61.0	98.0	0.0	7.5
8	10.1	27.2	58.0	100.0	0.0	9.1
9	9.9	27.0	59.0	100.0	0.0	7.6
10	9.4	27.3	59.0	100.0	0.0	8.6

11	9.6	26.8	57.0	100.0	0.0	8.5
12	9.9	26.6	58.0	100.0	0.0	9.2
13	10.1	26.7	58.0	100.0	0.0	8.0
14	9.4	26.5	62.0	100.0	0.0	9.1
15	9.9	26.4	59.0	100.0	0.0	8.9
16	9.7	25.5	55.0	100.0	0.0	9.0
17	9.7	26.5	55.0	100.0	0.0	9.0
18	12.3	27.2	54.0	95.0	0.0	9.3
19	12.7	27.0	57.0	100.0	0.0	5.4
20	15.7	26.5	75.0	98.0	0.0	4.2
21	12.1	22.7	70.0	100.0	0.0	0.0
22	11.3	25.5	63.0	100.0	0.0	5.9
23	14.7	26.7	62.0	98.0	0.0	7.7
24	13.0	27.4	56.0	98.0	0.0	4.9
25	16.5	28.0	77.0	96.0	0.0	6.6
26	14.1	23.0	74.0	100.0	3.8	0.0
27	16.1	24.5	72.0	100.0	0.0	2.7
28	11.3	22.8	73.0	100.0	39.7	6.8
29	10.5	23.5	61.0	100.0	0.0	5.6
30	9.3	25.0	58.0	100.0	0.0	7.7
31	9.7	25.7	59.0	100.0	0.0	8.2
01.01.17	11.4	25.2	58.0	98.0	0.0	8.1
2	10.7	26.5	49.0	100.0	0.0	8.4
3	11.0	26.4	56.0	98.0	0.0	7.4
4	12.7	27.2	52.0	98.0	0.1	7.3
5	10.6	25.9	60.0	100.0	0.0	8.9
6	9.7	25.4	59.0	100.0	0.0	9.0
7	9.1	25.0	58.0	100.0	0.0	8.5
8	8.8	24.7	58.0	93.0	0.0	8.7
9	8.5	24.8	51.0	98.0	0.0	7.3
10	10.1	25.7	67.0	97.0	0.0	2.5
11	11.3	23.2	61.0	98.0	0.0	7.7
12	8.3	23.3	64.0	100.0	0.0	7.8
13	9.6	23.8	61.0	97.0	0.0	6.8
14	8.4	22.7	62.0	100.0	0.0	5.2
15	7.6	23.0	63.0	100.0	0.0	7.9
16	8.3	23.5	54.0	100.0	0.0	8.0
17	8.5	23.7	55.0	100.0	0.0	7.8
18	7.6	24.2	58.0	100.0	0.0	8.2
19	7.7	25.0	54.0	97.0	0.0	8.9
20	8.7	25.6	58.0	98.0	0.0	8.0
21	8.1	25.2	55.0	97.0	0.0	8.2
22	8.4	25.5	46.0	95.0	0.0	9.1
23	8.7	26.6	48.0	95.0	0.0	9.3
24	8.5	26.5	51.0	97.0	0.0	9.4
25	8.4	26.7	47.0	97.0	0.0	9.3
26	8.3	27.7	50.0	95.0	0.0	9.6
27	10.0	27.8	54.0	97.0	0.0	3.9
28	11.5	26.9	62.0	95.0	0.0	2.7
29	11.6	23.3	65.0	100.0	0.0	6.0
30	9.8	24.6	61.0	100.0	0.0	6.4
31	11.3	25.9	58.0	95.0	0.0	6.4
01.02.17	12.9	26.5	68.0	100.0	2.0	6.9
2	11.0	24.7	55.0	97.0	0.0	7.9
3	11.7	26.0	52.0	95.0	0.0	8.4
4	11.4	27.3	51.0	95.0	0.0	9.1
5	10.8	27.9	53.0	93.0	0.0	7.1
6	11.6	28.5	46.0	93.0	0.0	8.4
7	13.8	28.7	59.0	93.0	0.0	0.0

8	12.4	25.1	61.0	95.0	0.0	4.0
9	12.4	27.0	61.0	95.0	0.0	2.5
10	15.1	26.7	49.0	89.0	0.0	4.8
11	12.4	28.0	55.0	95.0	0.0	3.3
12	10.2	25.4	51.0	95.0	0.0	5.3
13	10.7	26.4	46.0	95.0	0.0	6.2
14	11.2	27.9	43.0	96.0	0.0	6.4
15	11.5	28.2	44.0	93.0	0.0	7.6
16	10.7	28.5	44.0	93.0	0.0	8.5
17	11.5	29.4	40.0	93.0	0.0	8.3
18	11.6	29.8	42.0	93.0	0.0	7.5
19	12.2	29.6	40.0	93.0	0.0	7.4
20	16.1	30.1	77.0	92.0	0.0	0.0
21	16.2	21.7	92.0	100.0	26.4	0.0
22	16.4	20.8	82.0	100.0	8.2	4.3
23	16.4	24.5	67.0	100.0	2.8	5.3
24	14.2	26.3	54.0	94.0	0.0	7.8
25	13.7	26.4	49.0	93.0	0.0	6.5
26	14.2	26.4	52.0	89.0	0.0	6.4
27	15.4	26.2	56.0	94.0	0.0	2.7
28	16.5	25.8	59.0	94.0	0.0	5.0

#### KALYANI

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
01.11.16	25.0	33.0	73.0	95.0	0.0	7.2
2	23.0	33.0	62.0	93.0	0.0	9.8
3	24.4	33.0	70.0	95.0	0.0	5.8
4	23.2	27.6	92.0	98.0	0.0	0.0
5	21.0	23.2	100.0	100.0	0.0	0.0
6	19.5	28.2	74.0	100.0	0.0	9.3
7	19.0	30.0	62.0	94.0	0.0	9.1
8	17.5	31.2	53.0	64.0	0.0	9.1
9	16.0	30.0	49.0	94.0	0.0	7.9
10	16.8	30.0	62.0	92.0	0.0	5.5
11	19.0	30.0	65.0	94.0	0.0	2.3
12	18.5	31.5	53.0	94.0	0.0	8.0
13	19.0	30.8	52.0	94.0	0.0	9.2
14	19.0	30.4	52.0	94.0	0.0	8.0
15	17.8	29.4	51.0	92.0	0.0	8.6
16	15.5	29.5	4.0	93.0	0.0	9.5
17	13.5	30.0	45.0	89.0	0.0	9.5
18	14.4	29.4	47.0	89.0	0.0	9.6
19	14.3	30.0	45.0	91.0	0.0	8.9
20	14.4	29.0	52.0	89.0	0.0	7.5
21	15.0	29.0	53.0	91.0	0.0	6.9
22	15.5	28.9	54.0	89.0	0.0	6.8
23	15.5	30.0	57.0	91.0	0.0	4.6
24	15.6	29.0	52.0	96.0	0.0	4.8
25	15.5	29.0	54.0	93.0	0.0	7.6
26	15.5	29.0	61.0	93.0	0.0	2.7
27	16.5	28.7	59.0	94.0	0.0	1.3
28	16.0	29.4	60.0	94.0	0.0	4.3
29	16.6	30.0	55.0	94.0	0.0	6.6
30	17.0	30.1	57.0	92.0	0.0	6.5
01.12.16	17.4	29.3	64.0	92.0	0.0	5.2
2	17.0	29.0	52.0	92.0	0.0	6.2

3	17.0	28.6	55.0	92.0	0.0	7.9
4	16.0	28.0	56.0	91.0	0.0	5.7
5	15.0	27.4	60.0	96.0	0.0	7.1
6	15.0	28.5	58.0	96.0	0.0	7.7
7	14.4	28.4	51.0	93.0	0.0	8.4
8	14.4	28.0	53.0	93.0	0.0	8.5
9	13.0	25.4	66.0	95.0	0.0	8.4
10	11.8	26.3	55.0	95.0	0.0	7.5
11	11.0	25.4	57.0	95.0	0.0	6.5
12	11.4	26.3	55.0	93.0	0.0	7.9
13	11.4	25.0	51.0	95.0	0.0	7.9
14	10.5	23.6	59.0	95.0	0.0	5.2
15	10.5	25.0	51.0	92.0	0.0	8.1
16	9.0	25.5	54.0	94.0	0.0	8.0
17	12.2	26.5	53.0	93.0	0.0	7.6
18	12.0	26.0	58.0	91.0	0.0	3.6
19	12.0	27.0	59.0	95.0	0.0	6.1
20	12.5	26.0	55.0	90.0	0.0	5.0
21	11.4	25.4	53.0	93.0	0.0	5.2
22	11.4	24.8	59.0	93.0	0.0	0.0
23	15.5	25.8	68.0	89.0	0.0	0.0
24	13.5	27.8	60.0	95.0	0.0	1.1
25	14.4	28.0	67.0	93.0	0.0	0.0
26	14.2	28.5	63.0	98.0	0.0	0.0
27	15.0	26.0	64.0	96.0	0.0	3.2
28	13.9	21.0	80.0	96.0	0.0	1.6
29	12.2	24.4	75.0	100.0	0.0	3.3
30	12.0	26.2	58.0	95.0	0.0	7.3
31	12.2	27.4	62.0	93.0	0.0	4.8
01.01.17	14.4	26.0	68.0	100.0	0.0	0.7
2	12.8	26.8	59.0	93.0	0.0	4.4
3	14.4	26.6	61.0	91.0	0.0	6.1
4	13.0	26.0	54.0	95.0	0.0	6.8
5	12.0	25.5	52.0	95.0	0.0	7.3
6	10.5	23.8	58.0	95.0	0.0	6.7
7	9.8	25.0	48.0	95.0	0.0	6.5
8	9.0	26.8	51.0	94.0	0.0	7.6
9	11.0	27.0	42.0	88.0	0.0	6.9
10	13.0	22.2	55.0	93.0	0.0	0.0
11	12.0	25.0	51.0	91.0	0.0	6.6
12	12.9	22.8	46.0	86.0	0.0	5.0
13	8.5	23.0	41.0	94.0	0.0	6.9
14	7.2	22.1	39.0	91.0	0.0	8.6
15	6.4	24.5	46.0	91.0	0.0	7.8
16	7.0	24.8	43.0	91.0	0.0	7.8
17	8.3	27.0	39.0	86.0	0.0	7.0
18	10.5	27.0	43.0	88.0	0.0	7.2
19	11.2	27.2	43.0	90.0	0.0	7.3
20	9.0	27.3	45.0	92.0	0.0	7.6
21	9.2	26.2	44.0	92.0	0.0	9.0
22	8.5	27.6	43.0	89.0	0.0	9.1
23	9.0	27.0	44.0	89.0	0.0	7.4
24	11.0	27.8	48.0	90.0	0.0	8.0
25	11.2	28.0	45.0	88.0	0.0	7.6
26	12.0	30.0	50.0	91.0	0.0	6.8
27	16.5	27.2	60.0	90.0	0.0	1.0
28	14.5	26.0	63.0	93.0	0.0	6.2
29	10.5	26.0	50.0	90.0	0.0	9.4
30	11.5	27.0	51.0	88.0	0.0	8.5

31	12.0	27.8	52.0	90.0	0.0	7.6
01.02.17	13.3	27.8	56.0	93.0	0.0	5.8
2	13.5	26.0	57.0	93.0	0.0	3.9
3	10.7	26.0	51.0	95.0	0.0	7.7
4	11.0	27.7	54.0	93.0	0.0	7.1
5	13.0	29.8	46.0	88.0	0.0	8.0
6	12.5	31.4	39.0	90.0	0.0	8.5
7	14.5	29.4	42.0	89.0	0.0	8.4
8	12.5	28.6	38.0	93.0	0.0	9.7
9	11.5	29.7	40.0	93.0	0.0	9.5
10	14.5	30.0	42.0	89.0	0.0	8.0
11	15.5	28.6	43.0	85.0	0.0	6.4
12	14.5	29.6	49.0	91.0	0.0	4.9
13	15.4	30.6	47.0	91.0	0.0	3.0
14	17.3	31.2	45.0	92.0	0.0	5.3
15	16.5	30.2	35.0	87.0	0.0	7.1
16	14.0	30.2	41.0	89.0	0.0	7.5
17	15.5	30.1	46.0	89.0	0.0	4.3
18	17.0	31.5	48.0	90.0	0.0	0.8
19	17.3	30.6	57.0	90.0	0.0	0.0
20	20.5	31.4	61.0	94.0	0.0	0.6
21	21.6	34.5	44.0	98.0	0.0	7.4
22	23.4	34.4	51.0	88.0	0.0	7.2
23	20.9	31.2	31.0	82.0	0.0	6.6
24	14.0	30.9	31.0	84.0	0.0	9.3
25	12.4	30.0	35.0	84.0	0.0	10.0
26	12.4	31.2	39.0	88.0	0.0	9.4
27	14.0	32.9	41.0	91.0	0.0	9.1
28	15.0	33.0	61.0	89.0	0.0	9.5
01.03.17	14.5	33.6	44.0	94.0	0.0	9.5
2	18.2	34.5	42.0	90.0	0.0	9.0
3	21.0	35.7	36.0	89.0	0.0	8.1
4	20.4	32.0	66.0	98.0	0.0	7.0
5	21.0	32.3	60.0	93.0	0.0	5.8
6	21.6	32.4	57.0	96.0	0.0	7.3
7	16.8	33.0	38.0	94.0	0.0	8.8
8	16.6	28.4	76.0	89.0	0.0	0.6
9	18.0	30.0	64.0	100.0	T	3.3
10	20.0	32.5	64.0	96.0	0.2	2.7
11	21.0	31.4	67.0	98.0	3.0	3.9
12	20.0	29.6	41.0	94.0	T	8.9
13	14.5	30.0	32.0	84.0	0.0	9.9
14	13.5	31.2	36.0	82.0	0.0	9.8
15	15.0	32.0	29.0	85.0	0.0	9.8
16	14.0	32.9	32.0	82.0	0.0	9.8
17	16.6	35.0	28.0	88.0	0.0	9.0
18	23.5	34.8	41.0	92.0	0.0	8.9
19	21.6	34.0	34.0	91.0	0.0	6.9
20	22.6	27.8	59.0	91.0	5.7	7.5
21	17.0	32.6	47.0	90.0	0.0	9.1
22	20.0	33.6	47.0	100.0	0.0	7.6
23	22.5	35.0	37.0	91.0	0.0	7.9
24	24.0	36.4	51.0	93.0	0.0	7.5
25	25.3	37.2	39.0	92.0	0.0	8.7
26	26.0	34.0	63.0	93.0	0.0	4.8
27	25.9	36.0	48.0	93.0	0.0	7.2
28	26.0	35.0	54.0	93.0	T	6.9

**KANPUR**

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
14.10.16	17.2	34.6	32.0	86.0	0.0	8.2
15	17.4	33.8	31.0	84.0	0.0	7.3
16	17.4	33.8	43.0	93.0	0.0	9.1
17	16.7	33.6	37.0	89.0	0.0	8.4
18	15.6	33.0	36.0	85.0	0.0	9.0
19	15.8	32.6	46.0	87.0	0.0	8.2
20	16.8	33.2	47.0	79.0	0.0	9.0
21	16.8	34.6	33.0	68.0	0.0	8.6
22	18.0	34.6	34.0	64.0	0.0	9.2
23	19.4	33.4	39.0	67.0	0.0	9.3
24	17.4	33.8	34.0	77.0	0.0	8.5
25	16.4	33.8	38.0	85.0	0.0	7.9
26	16.5	33.2	31.0	75.0	0.0	8.5
27	15.0	33.4	36.0	90.0	0.0	9.0
28	13.8	32.4	34.0	81.0	0.0	8.5
29	14.6	32.4	37.0	88.0	0.0	8.5
30	14.0	31.4	44.0	96.0	0.0	6.0
31	14.0	31.4	37.0	98.0	0.0	5.6
01.11.16	13.6	31.0	37.0	89.0	0.0	7.9
2	13.6	31.4	37.0	79.0	0.0	8.1
3	14.1	31.6	36.0	83.0	0.0	8.7
4	14.0	31.2	39.0	90.0	0.0	8.2
5	13.8	30.4	44.0	91.0	0.0	8.6
6	14.2	30.4	38.0	84.0	0.0	6.2
7	13.1	32.0	37.0	80.0	0.0	0.0
8	15.6	30.2	39.0	72.0	0.0	4.1
9	13.4	29.6	47.0	71.0	0.0	0.3
10	12.0	30.0	43.0	93.0	0.0	5.6
11	10.6	29.2	44.0	93.0	0.0	3.5
12	12.2	29.6	48.0	93.0	0.0	4.6
13	12.4	29.8	42.0	94.0	0.0	5.5
14	11.6	23.6	41.0	89.0	0.0	7.6
15	11.8	29.8	43.0	89.0	0.0	8.0
16	12.0	28.4	41.0	91.0	0.0	7.5
17	12.0	28.6	38.0	75.0	0.0	7.0
18	12.4	27.5	44.0	71.0	0.0	8.0
19	10.6	28.4	43.0	84.0	0.0	7.5
20	10.4	28.4	43.0	93.0	0.0	5.8
21	10.2	28.4	47.0	89.0	0.0	6.0
22	10.8	30.0	38.0	73.0	0.0	4.1
23	16.2	29.4	42.0	65.0	0.0	6.1
24	18.2	28.0	31.0	89.0	0.0	5.6
25	13.5	29.0	42.0	74.0	0.0	4.5
26	14.6	26.4	51.0	65.0	0.0	5.0
27	11.5	29.4	41.0	89.0	0.0	4.9
28	14.8	28.8	39.0	67.0	0.0	2.8
29	9.0	26.4	59.0	93.0	0.0	89.0
30	13.0	24.8	75.0	98.0	0.0	5.0
01.12.16	14.2	23.2	81.0	100.0	0.0	0.0
2	14.6	20.4	89.0	100.0	0.0	0.0
3	13.6	19.2	90.0	100.0	0.0	0.0
4	12.2	21.4	73.0	100.0	0.0	0.0
5	8.6	24.6	50.0	100.0	0.0	0.0
6	10.7	16.4	89.0	100.0	0.0	2.2
7	11.8	19.4	70.0	98.0	0.0	0.0
8	9.2	17.6	78.0	100.0	0.0	0.0
9	9.4	19.4	66.0	100.0	0.0	1.2

10	9.4	18.8	77.0	10.0	0.0	3.9
11	10.4	26.4	51.0	100.0	0.0	0.0
12	11.0	25.6	59.0	100.0	0.0	5.5
13	10.0	27.5	39.0	97.0	0.0	2.6
14	9.4	27.2	44.0	97.0	0.0	6.7
15	8.1	26.0	38.0	88.0	0.0	5.6
16	6.6	24.2	42.0	92.0	0.0	7.3
17	6.2	24.8	41.0	87.0	0.0	7.4
18	7.5	25.0	40.0	95.0	0.0	5.4
19	6.1	24.3	49.0	95.0	0.0	6.5
20	10.5	25.5	43.0	81.0	0.0	5.5
21	11.3	25.2	42.0	79.0	0.0	7.2
22	7.0	23.6	53.0	90.0	0.0	7.3
23	7.6	23.4	62.0	100.0	0.0	4.1
24	6.4	23.4	64.0	77.0	0.0	0.0
25	7.2	25.8	53.0	100.0	0.0	0.0
26	12.5	23.4	65.0	100.0	0.0	0.0
27	10.0	23.2	53.0	85.0	0.0	0.0
28	7.4	22.6	61.0	92.0	0.0	0.0
29	10.7	15.6	85.0	100.0	0.0	0.0
30	9.4	19.0	66.0	95.0	0.0	0.0
31	8.6	18.6	71.0	100.0	0.0	0.0
01.01.17	11.4	18.6	75.0	95.0	0.0	0.0
2	11.8	18.4	78.0	95.0	0.4	0.0
3	11.4	19.4	79.0	95.0	0.0	0.0
4	10.8	21.4	66.0	100.0	0.0	0.0
5	7.8	21.5	72.0	100.0	0.0	3.4
6	8.4	22.2	67.0	100.0	0.0	0.0
7	11.4	18.8	75.0	93.0	0.0	6.0
8	11.6	18.2	92.0	98.0	0.0	0.0
9	9.0	21.0	61.0	95.0	0.0	0.0
10	8.8	20.2	44.0	82.0	0.0	0.5
11	5.4	18.4	40.0	68.0	0.0	7.0
12	2.0	17.8	41.0	93.0	0.0	9.0
13	1.4	17.6	41.0	90.0	0.0	7.5
14	3.7	20.2	46.0	91.0	0.0	7.0
15	4.0	22.0	43.0	91.0	0.0	6.5
16	5.0	24.0	46.0	91.0	0.0	6.7
17	8.0	18.0	69.0	95.0	0.0	4.2
18	5.7	18.2	63.0	100.0	0.0	5.0
19	2.0	22.0	53.0	97.0	0.0	4.2
20	8.0	22.4	46.0	87.0	0.0	5.7
21	8.7	21.4	45.0	78.0	0.0	8.1
22	6.7	24.6	45.0	91.0	0.0	4.7
23	9.0	25.6	51.0	88.0		6.3
24	11.5	25.6	54.0	93.0	0.0	7.3
25	9.7	26.4	54.0	97.0	0.0	7.0
26	8.3	26.6	54.0	95.0	0.0	7.1
27	11.4	19.4	77.0	98.0	24.6	6.0
28	10.2	21.0	68.0	98.0	3.2	3.7
29	11.2	19.6	72.0	97.0	0.0	7.3
30	8.2	21.4	68.0	100.0	0.0	4.6
31	8.2	30.0	69.0	95.0	0.0	2.6
01.02.17	9.4	23.2	65.0	100.0	0.0	6.3
2	8.8	23.4	47.0	95.0	0.0	6.1
3	7.8	23.6	53.0	94.0	0.0	8.4
4	9.0	24.0	59.0	95.0	0.0	8.1
5	8.8	26.2	54.0	95.0	0.0	6.1
6	13.2	25.2	66.0	93.0	0.0	6.9



7	10.7	22.4	51.0	84.0	0.0	6.8
8	9.3	24.0	48.0	88.0	0.0	9.9
9	8.6	24.4	50.0	95.0	0.0	9.9
10	9.8	22.6	52.0	86.0	0.0	7.4
11	7.4	23.4	51.0	85.0	0.0	9.8
12	8.6	25.2	48.0	93.0	0.0	8.2
13	10.0	24.8	53.0	97.0	0.0	6.4
14	8.8	24.4	51.0	90.0	0.0	7.0
15	8.8	24.8	49.0	86.0	0.0	9.1
16	10.8	25.8	58.0	89.0	0.0	8.6
17	11.2	27.6	43.0	83.0	0.0	6.2
18	13.2	28.0	57.0	100.0	0.0	7.0
19	13.6	29.0	51.0	96.0	0.0	6.5
20	13.5	31.6	47.0	88.0	0.0	8.0
21	15.6	28.6	46.0	79.0	0.0	8.1
22	10.7	27.0	40.0	86.0	0.0	7.8
23	9.6	26.0	38.0	79.0	0.0	8.2
24	10.4	25.5	39.0	68.0	0.0	8.1
25	12.6	26.4	40.0	62.0	0.0	7.9
26	12.2	27.2	40.0	68.0	0.0	7.5
27	11.2	28.4	34.0	76.0	0.0	7.4
28	11.3	30.4	41.0	75.0	0.0	7.1

#### KOTA

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
01.09.16	23.0	32.5	81.0	98.0	35.6	5.8
2	25.0	31.4	83.0	92.0	5.8	6.6
3	24.0	31.0	66.0	93.0	11.0	1.2
4	23.8	31.6	60.0	90.0	0.0	9.2
5	24.2	31.6	59.0	85.0	0.0	8.6
6	23.8	31.0	59.0	87.0	0.0	9.4
7	24.2	31.2	58.0	84.0	0.0	9.1
8	24.2	31.6	60.0	87.0	0.0	9.7
9	24.0	32.0	56.0	85.0	0.0	7.4
10	24.2	32.4	60.0	84.0	0.0	9.5
11	23.0	32.2	53.0	85.0	0.0	9.9
12	24.0	32.5	54.0	85.0	0.0	10.2
13	23.2	32.4	43.0	88.0	0.0	9.9
14	24.5	33.5	67.0	93.0	0.0	9.8
15	24.5	32.5	62.0	81.0	0.0	5.3
16	24.8	34.0	58.0	92.0	0.0	8.7
17	24.0	34.5	46.0	97.0	0.0	6.5
18	24.5	35.2	53.0	80.0	0.0	9.9
19	24.5	34.8	46.0	93.0	0.0	9.4
20	25.5	35.5	54.0	84.0	0.0	9.5
21	25.5	35.2	59.0	84.0	0.0	9.8
22	25.5	35.4	63.0	84.0	0.0	9.5
23	24.5	33.0	54.0	89.0	0.0	2.3
24	25.5	34.4	50.0	79.0	0.0	8.6
25	23.0	34.6	57.0	85.0	0.0	8.4
26	23.5	33.8	62.0	95.0	0.0	9.3
27	24.0	34.6	46.0	87.0	0.0	9.3
28	25.0	35.0	42.0	81.0	0.0	9.2
29	22.8	35.6	45.0	74.0	0.0	9.7
30	24.0	35.0	49.0	85.0	0.0	9.7
01.10.16	26.7	34.4	82.0	77.0	0.0	7.1

2	24.6	32.7	60.0	86.0	11.2	3.0
3	25.4	34.2	51.0	85.0	0.0	9.7
4	26.5	34.4	49.0	80.0	0.0	9.7
5	25.5	35.6	87.0	83.0	0.0	8.6
6	24.5	33.8	74.0	93.0	10.6	4.6
7	23.5	30.0	62.0	93.0	0.0	1.2
8	24.0	32.2	46.0	96.0	0.0	5.0
9	23.0	34.4	43.0	88.0	0.0	8.3
10	23.2	35.6	48.0	82.0	1.4	8.5
11	21.5	34.4	42.0	91.0	0.0	9.4
12	21.5	35.2	36.0	75.0	0.0	9.5
13	21.6	33.8	27.0	83.0	0.0	9.7
14	18.7	34.8	24.0	87.0	0.0	9.8
15	20.0	34.5	32.0	81.0	0.0	9.5
16	16.5	34.5	29.0	96.0	0.0	9.5
17	17.7	34.8	26.0	80.0	0.0	9.5
18	17.0	34.6	24.0	71.0	0.0	9.4
19	16.5	34.6	26.0	88.0	0.0	10.0
20	17.0	35.0	21.0	81.0	0.0	9.9
21	17.4	35.3	28.0	85.0	0.0	9.8
22	18.0	34.6	51.0	83.0	0.0	9.9
23	17.0	34.4	33.0	66.0	0.0	9.7
24	18.6	34.8	50.0	86.0	0.0	9.8
25	20.7	33.8	48.0	69.0	0.0	8.8
26	17.4	33.4	54.0	74.0	0.0	9.6
27	17.0	34.2	24.0	82.0	0.0	9.8
28	13.2	33.8	18.0	84.0	0.0	9.8
29	13.0	33.6	20.0	89.0	0.0	8.5
30	12.4	33.8	16.0	84.0	0.0	8.0
31	13.0	33.4	25.0	89.0	0.0	8.9
01.11.16	13.0	32.4	29.0	91.0	0.0	8.3
2	13.0	31.4	26.0	91.0	0.0	8.0
3	12.5	30.6	26.0	89.0	0.0	7.6
4	13.2	30.6	27.0	88.0	0.0	8.3
5	12.8	30.2	26.0	89.0	0.0	6.6
6	12.2	31.4	17.0	95.0	0.0	7.6
7	13.6	32.8	14.0	67.0	0.0	8.8
8	11.2	32.0	16.0	79.0	0.0	9.4
9	10.8	31.0	20.0	81.0	0.0	8.1
10	11.8	32.2	20.0	77.0	0.0	9.3
11	11.6	32.2	21.0	88.0	0.0	9.7
12	11.2	31.0	25.0	90.0	0.0	9.4
13	12.0	31.4	34.0	88.0	0.0	9.2
14	13.4	30.2	30.0	78.0	0.0	8.8
15	11.0	29.6	27.0	85.0	0.0	8.4
16	11.0	29.6	28.0	88.0	0.0	8.4
17	10.5	28.5	31.0	93.0	0.0	8.2
18	10.0	28.6	27.0	93.0	0.0	8.2
19	10.0	29.0	22.0	88.0	0.0	8.7
20	10.2	30.8	24.0	95.0	0.0	9.1
21	10.5	31.2	26.0	100.0	0.0	8.7
22	10.5	31.0	27.0	90.0	0.0	8.8
23	10.5	30.0	27.0	87.0	0.0	8.9
24	10.0	30.4	33.0	100.0	0.0	9.6
25	10.0	29.2	29.0	92.0	0.0	9.0
26	10.5	29.4	23.0	80.0	0.0	9.1
27	10.0	30.0	29.0	90.0	0.0	9.7
28	10.5	30.0	22.0	90.0	0.0	9.4
29	9.5	30.5	23.0	88.0	0.0	9.5

30	10.5	31.0	34.0	88.0	0.0	9.3
01.12.16	10.2	30.2	26.0	90.0	0.0	8.8
2	11.0	29.4	43.0	93.0	0.0	8.2
3	10.0	27.4	42.0	95.0	0.0	7.2
4	7.5	25.2	32.0	87.0	0.0	7.5
5	8.0	26.2	32.0	92.0	0.0	8.5
6	8.0	27.2	32.0	92.0	0.0	8.6
7	8.3	28.4	31.0	86.0	0.0	8.7
8	8.0	28.0	35.0	92.0	0.0	9.0
9	8.5	28.0	30.0	94.0	0.0	8.4
10	10.8	29.2	35.0	83.0	0.0	8.6
11	10.8	29.2	45.0	95.0	0.0	8.1
12	8.0	28.0	56.0	97.0	0.0	8.7
13	11.4	28.0	33.0	90.0	0.0	8.0
14	10.2	28.2	27.0	92.0	0.0	7.9
15	9.8	27.6	36.0	95.0	0.0	8.2
16	9.2	26.4	37.0	92.0	0.0	8.2
17	8.5	25.5	34.0	92.0	0.0	8.5
18	9.2	25.4	39.0	92.0	0.0	8.9
19	7.7	25.6	44.0	94.0	0.0	8.4
20	7.4	24.6	26.0	89.0	0.0	8.3
21	6.2	25.6	33.0	94.0	0.0	8.9
22	6.0	26.8	29.0	94.0	0.0	9.1
23	6.8	27.0	29.0	91.0	0.0	8.7
24	8.4	27.5	41.0	92.0	0.0	9.1
25	9.8	28.0	20.0	81.0	0.0	8.4
26	7.2	25.4	55.0	89.0	0.0	9.2
27	7.2	22.0	42.0	94.0	0.0	6.0
28	6.5	24.8	41.0	94.0	0.0	7.7
29	7.5	25.5	39.0	92.0	0.0	8.0
30	9.5	27.0	53.0	92.0	0.0	8.1
31	8.6	25.6	59.0	94.0	0.0	7.6

#### MODIPURAM

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min.	Max.	Min.	Max.	
24.10.16	15.5	35.0	68.0	42.0	0.0
25	17.0	33.0	59.0	39.0	0.0
26	15.5	33.0	77.0	42.0	0.0
27	13.5	33.0	80.0	40.0	0.0
28	14.0	32.0	73.0	38.0	0.0
29	15.0	30.5	85.0	37.0	0.0
30	15.0	28.0	73.0	65.0	0.0
31	14.0	28.0	90.0	57.0	0.0
01.11.16	14.0	30.0	90.0	39.0	0.0
2	14.0	30.0	95.0	39.0	0.0
3	14.0	31.0	73.0	42.0	0.0
4	14.0	27.0	85.0	50.0	0.0
5	15.0	28.0	89.0	33.0	0.0
6	14.0	27.5	94.0	39.0	0.0
7	13.0	28.5	79.0	19.0	0.0
8	13.5	28.0	89.0	35.0	0.0
9	12.0	27.0	83.0	33.0	0.0
10	11.5	29.0	89.0	29.0	0.0
11	12.0	19.0	80.0	29.0	0.0
12	12.0	30.0	76.0	36.0	0.0
13	12.0	29.0	89.0	42.0	0.0

14	13.0	27.0	79.0	36.0	0.0
15	11.5	27.0	85.0	83.0	0.0
16	11.0	27.5	83.0	26.0	0.0
17	11.0	27.0	77.0	28.0	0.0
18	11.0	25.5	77.0	44.0	0.0
19	10.0	26.0	88.0	33.0	0.0
20	11.0	28.0	78.0	35.0	0.0
21	11.0	28.0	88.0	36.0	0.0
22	11.0	28.5	78.0	29.0	0.0
23	11.5	28.0	83.0	33.0	0.0
24	11.0	26.5	78.0	33.0	0.0
25	11.0	28.5	71.0	19.0	0.0
26	12.0	27.5	59.0	31.0	0.0
27	11.0	28.0	72.0	24.0	0.0
28	11.0	27.0	67.0	28.0	0.0
29	11.5	24.0	94.0	61.0	0.0
30	12.0	26.0	94.0	56.0	0.0
01.12.16	12.0	26.5	94.0	56.0	0.0
2	11.5	24.5	94.0	55.0	0.0
3	8.5	25.5	93.0	36.0	0.0
4	8.5	24.0	93.0	47.0	0.0
5	9.0	25.0	87.0	39.0	0.0
6	11.5	15.5	94.0	89.0	0.0
7	13.0	17.5	88.0	77.0	0.0
8	9.5	19.5	93.0	78.0	0.0
9	8.5	22.5	86.0	46.0	0.0
10	12.0	15.0	88.0	78.0	0.0
11	12.0	24.0	94.0	61.0	0.0
12	12.0	26.0	94.0	24.0	0.0
13	9.5	23.5	93.0	44.0	0.0
14	10.0	21.0	87.0	50.0	0.0
15	8.0	22.0	87.0	41.0	0.0
16	6.0	22.0	86.0	40.0	0.0
17	6.0	23.5	93.0	41.0	0.0
18	7.0	23.0	86.0	39.0	0.0
19	6.5	23.0	86.0	25.0	0.0
20	8.5	24.0	93.0	36.0	0.0
21	6.0	23.5	86.0	36.0	0.0
22	4.7	22.0	81.0	53.0	0.0
23	6.5	25.5	93.0	44.0	0.0
24	8.5	23.5	93.0	52.0	0.0
25	7.0	21.5	87.0	65.0	0.0
26	10.0	21.5	87.0	43.0	0.0
27	8.0	22.0	87.0	40.0	0.0
28	7.0	22.5	86.0	50.0	0.0
29	10.0	15.5	88.0	78.0	0.0
30	9.5	18.0	93.0	62.0	0.0
31	7.0	20.0	86.0	67.0	0.0
01.01.17	8.5	13.5	86.0	52.0	0.0
2	8.7	25.0	87.0	46.0	0.0
3	8.5	23.5	86.0	51.0	0.0
4	8.0	24.0	86.0	39.0	0.0
5	8.5	24.5	86.0	47.0	0.0
6	8.0	19.0	88.0	73.0	0.0
7	7.5	14.0	94.0	88.0	30mm
8	8.0	20.0	93.0	63.0	1mm
9	9.0	19.5	93.0	44.0	0.0
10	5.5	17.0	85.0	26.0	0.0
11	3.0	16.5	83.0	34.0	0.0

12	4.0	18.0	85.0	45.0	0.0
13	4.0	18.5	84.0	72.0	0.0
14	2.5	18.5	91.0	54.0	0.0
15	9.0	21.5	86.0	42.0	0.0
16	11.0	19.5	75.0	48.0	0.0
17	9.0	14.0	93.0	71.0	0.0
18	4.5	18.0	85.0	74.0	0.0
19	6.0	21.5	85.0	45.0	0.0
20	5.0	20.0	92.0	32.0	0.0
21	7.0	20.0	86.0	44.0	0.0
22	9.5	23.0	87.0	47.0	0.0
23	9.0	23.0	87.0	43.0	0.0
24	9.0	24.0	87.0	41.0	0.0
25	8.0	18.0	78.0	49.0	0.0
26	9.0	18.0	89.0	80.0	1.75mm
27	13.0	16.5	94.0	71.0	38.5mm
28	10.0	18.5	93.0	72.0	0.0
29	13.0	20.0	88.0	64.0	0.0
30	9.0	205.0	93.0	61.0	0.0
31	9.0	20.5	93.0	73.0	0.0
01.02.17	9.0	21.0	93.0	65.0	0.0
2	8.5	22.5	93.0	65.0	0.0
3	8.0	23.0	86.0	50.0	0.0
4	11.0	22.0	87.0	64.0	0.0
5	15.0	20.5	89.0	73.0	2.25mm
6	11.5	22.5	93.0	58.0	0.0
7	8.0	21.0	86.0	49.0	0.0
8	8.5	21.5	87.0	49.0	0.0
9	8.0	22.0	87.0	58.0	0.0
10	8.5	22.0	87.0	50.0	0.0
11	8.5	22.5	86.0	49.0	0.0
12	8.0	25.0	87.0	49.0	0.0
13	8.0	24.0	93.0	39.0	0.0
14	8.5	24.5	87.0	39.0	0.0
15	9.0	25.0	87.0	39.0	0.0
16	11.0	25.0	88.0	51.0	0.0
17	12.0	25.5	84.0	51.0	0.0
18	11.0	29.0	82.0	42.0	0.0
19	12.5	28.5	89.0	40.0	0.0
20	13.5	31.0	57.0	28.0	0.0
21	15.0	26.0	89.0	22.0	0.0
22	14.0	26.0	87.0	17.0	0.0
23	10.0	25.0	71.0	22.0	0.0
24	9.0	24.5	69.0	22.0	0.0
25	10.0	27.0	57.0	28.0	0.0
26	10.0	27.0	77.0	36.0	0.0
27	8.5	28.0	77.0	24.0	0.0
28	11.0	29.5	69.0	33.0	0.0
01.03.17	11.0	29.5	56.0	35.0	0.0
2	10.0	27.5	80.0	45.0	0.0
3	11.5	26.0	73.0	19.0	0.0

#### OOTY

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
01.05.16	NA	NA	NA	NA	0.0	NA
2	21.0	25.2	33.0	36.0	0.0	9.5

3	21.0	25.6	39.0	37.0	0.0	8.0
4	21.0	25.4	42.0	62.0	0.0	8.0
5	19.6	25.0	57.0	49.0	10.0	8.2
6	15.0	24.0	62.0	53.0	8.0	4.0
7	14.0	23.0	78.0	91.0	NA	4.0
8	NA	NA	NA	NA	28.0	NA
9	13.0	23.6	63.0	56.0	6.8	6.0
10	11.2	22.2	50.0	50.0	3.0	6.0
11	13.2	22.2	56.0	63.0	0.0	5.0
12	14.2	22.0	59.0	53.0	0.0	4.0
13	14.0	23.0	53.0	53.0	0.0	4.5
14	13.0	23.0	59.0	53.0	NA	3.8
15	NA	NA	NA	NA	NA	NA
16	NA	NA	NA	NA	18.0	NA
17	11.6	23.6	92.0	76.0	0.0	2.0
18	12.0	20.6	61.0	79.0	0.0	1.0
19	13.0	22.0	62.0	63.0	0.0	4.8
20	15.0	24.0	63.0	67.0	0.0	6.5
21	13.0	20.0	61.0	53.0	NA	5.0
22	NA	NA	NA	NA	0.0	NA
23	14.0	26.0	44.0	63.0	0.0	11.0
24	14.0	26.0	56.0	57.0	0.0	7.0
25	13.0	26.0	39.0	63.0	0.0	11.0
26	14.0	25.0	48.0	53.0	1.5	7.5
27	14.0	21.0	63.0	67.0	2.0	6.5
28	14.0	24.0	71.0	69.0	NA	5.5
29	NA	NA	NA	NA	7.4	NA
30	13.6	24.2	67.0	53.0	4.0	4.5
31	14.0	22.5	66.0	66.0	0.0	4.0
01.06.16	13.5	21.4	71.0	63.0	8.0	1.0
2	13.0	20.6	78.0	81.0	18.0	2.5
3	14.0	20.6	71.0	82.0	1.0	1.0
4	12.0	21.2	71.0	79.0	1.0	2.0
5	NA	NA	NA	NA	NA	NA
6	15.0	22.4	77.0	78.0	25.0	4.0
7	12.2	21.2	74.0	90.0	0.0	0.0
8	12.0	21.6	94.0	94.0	6.6	0.0
9	12.0	20.2	80.0	78.0	12.8	0.0
10	13.0	19.0	96.0	86.0	5.5	0.0
11	NA	NA	NA	NA	NA	NA
12	NA	NA	NA	NA	NA	NA
13	14.0	20.4	79.0	74.0	1.2	0.0
14	14.0	20.4	63.0	75.0	0.0	1.0
15	13.0	19.6	90.0	88.0	0.0	2.0
16	12.0	20.0	78.0	72.0	0.0	1.0
17	12.0	19.8	61.0	58.0	0.0	1.0
18	14.0	20.2	88.0	80.0	3.6	1.0
19	NA	NA	NA	NA	NA	NA
20	12.0	20.0	81.0	78.0	1.0	1.5
21	12.5	20.0	71.0	83.0	0.0	2.2
22	NA	NA	NA	NA	NA	NA
23	12.0	21.4	82.0	90.0	6.2	2.2
24	13.4	17.6	82.0	92.0	1.4	0.0
25	14.2	19.6	79.0	76.0	0.0	3.5
26	NA	NA	NA	NA	NA	NA
27	14.0	18.2	92.0	94.0	7.0	0.0
28	11.2	16.2	90.0	88.0	15.0	0.0
29	11.5	16.2	88.0	96.0	42.0	0.0
30	13.0	15.6	94.0	96.0	18.6	0.0

01.07.16	12.0	16.2	83.0	90.0	1.0	3.0
2	13.0	18.2	63.0	77.0	0.0	0.0
3	NA	NA	NA	NA	NA	NA
4	14.0	18.0	81.0	85.0	0.0	0.0
5	12.5	18.2	85.0	84.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0
7	12.0	17.4	90.0	90.0	27.0	0.0
8	12.0	17.2	86.0	88.0	1.2	0.0
9	NA	NA	NA	NA	NA	NA
10	NA	NA	NA	NA	NA	NA
11	13.0	17.8	86.0	86.0	13.4	0.0
12	12.0	19.0	82.0	88.0	0.0	1.2
13	13.0	17.5	88.0	88.0	0.0	1.0
14	14.0	17.5	74.0	72.0	0.0	2.0
15	14.0	22.0	67.0	66.0	0.0	1.0
16	11.0	20.4	98.0	76.0	5.2	0.0
17	NA	NA	NA	NA	NA	NA
18	17.0	19.5	81.0	86.0	45.4	0.0
19	13.0	19.4	83.0	73.0	2.0	2.0
20	13.0	18.2	87.0	85.0	0.0	1.0
21	13.0	19.2	92.0	96.0	0.0	2.0
22	13.0	17.2	86.0	80.0	0.0	1.0
23	15.0	17.4	76.0	83.0	2.0	2.0
24	NA	NA	NA	NA	NA	NA
25	12.0	20.0	67.0	73.0	0.0	6.0
26	13.2	21.2	69.0	85.0	4.2	1.0
27	12.0	20.6	76.0	73.0	12.6	2.0
28	13.0	20.5	67.0	72.0	13.2	3.0
29	12.0	20.6	94.0	76.0	5.2	3.0
30	14.0	17.8	86.0	82.0	0.0	0.0
31	NA	NA	NA	NA	NA	NA
01.08.16	12.0	20.6	75.0	90.0	0.0	0.0
2	12.0	16.2	77.0	84.0	2.8	1.8
3	13.0	17.2	73.0	69.0	0.0	5.2
4	11.0	17.6	75.0	72.0	0.0	5.0
5	13.0	18.0	86.0	71.0	0.0	4.0
6	14.0	18.0	65.0	66.0	0.0	10.0
7	NA	NA	NA	NA	NA	NA
8	14.0	19.6	61.0	67.0	0.0	6.0
9	15.0	20.2	70.0	71.0	0.0	5.0
10	15.0	20.4	69.0	75.0	0.0	7.0
11	15.0	22.4	59.0	62.0	0.0	11.0
12	15.0	22.6	69.0	67.0	0.0	8.0
13	NA	NA	NA	NA	NA	NA
14	NA	NA	NA	NA	NA	NA
15	NA	NA	NA	NA	NA	NA
16	14.0	21.4	76.0	73.0	0.0	2.0
17	14.0	20.0	71.0	73.0	0.0	1.0
18	13.0	19.5	74.0	73.0	1.0	0.0
19	12.0	20.2	65.0	72.0	0.0	3.0
20	14.8	19.0	66.0	67.0	0.0	3.5
21	NA	NA	NA	NA	NA	NA
22	15.0	22.8	69.0	66.0	0.0	6.5
23	14.0	22.2	57.0	62.0	0.0	6.8
24	15.0	22.0	80.0	75.0	0.0	4.2
25	15.0	21.4	73.0	78.0	0.0	5.5
26	15.0	22.0	63.0	72.0	0.0	5.0
27	15.2	22.0	80.0	74.0	0.0	6.0
28	NA	NA	NA	NA	NA	NA

29	15.0	21.0	65.0	59.0	0.0	5.8
30	15.0	204.0	84.0	90.0	5.0	5.0
31	15.0	20.0	85.0	86.0	1.5	3.0
01.09.16	13.0	20.0	81.0	81.0	0.0	2.0
2	13.0	20.0	78.0	83.0	0.0	2.0
3	14.0	18.2	61.0	76.0	0.0	6.0
4	NA	NA	NA	NA	NA	NA
5	NA	NA	NA	NA	NA	NA
6	14.0	21.0	57.0	43.0	0.0	5.0
7	15.0	20.0	43.0	57.0	0.0	10.5
8	10.0	20.0	35.0	60.0	0.0	11.5
9	12.0	21.2	65.0	87.0	0.0	6.0
10	NA	NA	NA	NA	NA	NA
11	NA	NA	NA	NA	NA	NA
12	13.0	20.6	60.0	59.0	0.0	9.0
13	15.0	20.4	78.0	65.0	0.0	8.6
14	13.0	20.0	66.0	67.0	0.0	4.0
15	14.0	21.0	63.0	71.0	9.0	6.0
16	14.0	20.0	67.0	73.0	0.0	7.0
17	15.0	20.2	54.0	56.0	0.0	9.0
18	NA	NA	NA	NA	NA	NA
19	15.0	22.6	51.0	60.0	0.0	9.0
20	14.0	21.5	71.0	65.0	0.0	5.7
21	15.0	20.5	71.0	62.0	0.0	6.2
22	15.0	20.6	78.0	73.0	2.6	6.0
23	16.0	20.0	70.0	71.0	0.0	5.2
24	16.0	20.0	66.0	69.0	0.0	7.0
25	NA	NA	NA	NA	NA	NA
26	13.0	21.0	77.0	87.0	0.0	4.6
27	14.0	20.0	78.0	85.0	0.0	0.7
28	14.8	21.6	81.0	89.0	0.5	0.5
29	13.0	21.0	82.0	67.0	8.2	3.0
30	11.0	20.2	61.0	63.0	0.0	4.0

#### PANTNAGAR

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
01.10.16	26.4	33.0	84.0	62.0	0.0	9.7
2	25.4	34.5	84.0	63.0	0.0	7.6
3	25.2	34.0	83.0	65.0	0.0	7.2
4	25.8	33.5	89.0	70.0	Trace	2.3
5	25.4	32.5	90.0	78.0	0.0	0.0
6	23.3	30.6	95.0	64.0	0.0	0.0
7	23.0	30.5	91.0	62.0	0.0	0.3
8	24.5	32.0	88.0	67.0	0.0	4.6
9	21.4	32.2	88.0	65.0	0.0	1.9
10	21.3	32.0	89.0	55.0	0.0	8.5
11	18.4	32.8	87.0	58.0	0.0	0.8
12	17.6	33.0	90.0	65.0	0.0	8.9
13	18.5	31.2	89.0	60.0	0.0	8.8
14	17.4	32.0	90.0	57.0	0.0	7.8
15	20.1	31.8	89.0	53.0	0.0	7.7
16	18.9	32.0	78.0	48.0	0.0	6.4
17	17.4	32.2	70.0	49.0	0.0	6.9
18	16.8	31.5	88.0	42.0	0.0	7.7
19	15.7	31.7	79.0	46.0	0.0	9.3
20	15.5	31.5	66.0	46.0	0.0	8.4



21	15.9	30.5	90.0	46.0	0.0	7.3
22	15.1	30.3	91.0	36.0	0.0	7.0
23	13.8	32.0	91.0	36.0	0.0	8.0
24	13.9	30.5	91.0	37.0	0.0	7.6
25	14.1	31.5	91.0	36.0	0.0	8.3
26	13.3	31.6	89.0	39.0	0.0	6.7
27	13.4	31.0	89.0	37.0	0.0	8.2
28	13.3	31.4	89.0	38.0	0.0	8.1
29	16.9	30.0	65.0	45.0	0.0	7.7
30	13.4	29.9	83.0	41.0	0.0	7.4
31	13.3	29.6	91.0	40.0	0.0	6.4
01.11.16	12.8	30.2	89.0	32.0	0.0	8.0
2	11.9	30.5	88.0	35.0	0.0	7.7
3	13.4	31.2	89.0	37.0	0.0	9.0
4	12.9	31.5	89.0	41.0	0.0	9.3
5	12.8	29.4	87.0	37.0	0.0	8.5
6	12.4	29.0	91.0	35.0	0.0	5.9
7	9.9	29.2	90.0	38.0	0.0	7.0
8	9.4	28.5	92.0	36.0	0.0	8.3
9	11.2	28.6	90.0	34.0	0.0	8.4
10	11.4	29.0	91.0	36.0	0.0	8.7
11	12.4	29.2	91.0	37.0	0.0	8.2
12	12.3	29.5	89.0	36.0	0.0	8.9
13	12.9	30.4	91.0	37.0	0.0	9.0
14	10.8	29.4	90.0	37.0	0.0	8.2
15	9.7	27.5	90.0	36.0	0.0	7.3
16	8.9	28.0	92.0	36.0	0.0	7.6
17	9.2	27.5	92.0	39.0	0.0	8.0
18	10.3	26.1	92.0	41.0	0.0	7.9
19	9.9	25.5	90.0	43.0	0.0	6.4
20	10.1	26.5	92.0	42.0	0.0	7.3
21	10.3	27.2	93.0	36.0	0.0	8.0
22	9.4	27.0	95.0	40.0	0.0	6.5
23	9.5	26.5	95.0	51.0	0.0	7.4
24	10.4	26.6	97.0	35.0	0.0	7.8
25	9.0	27.0	92.0	33.0	0.0	7.8
26	9.9	25.5	86.0	58.0	0.0	7.9
27	11.8	25.0	94.0	57.0	0.0	0.0
28	12.0	25.6	96.0	57.0	0.0	0.0
29	11.4	24.5	93.0	47.0	0.0	0.0
30	12.3	27.5	93.0	45.0	0.0	7.0
01.12.16	11.4	27.8	93.0	42.0	0.0	7.7
2	10.5	27.0	93.0	42.0	0.0	6.5
3	10.0	26.5	95.0	54.0	0.0	6.4
4	9.3	24.5	95.0	52.0	0.0	3.0
5	12.7	25.0	95.0	67.0	0.0	4.7
6	14.1	20.6	93.0	57.0	0.0	0.0
7	11.4	23.0	95.0	55.0	0.0	5.1
8	10.2	22.4	97.0	57.0	0.0	4.8
9	12.9	22.0	95.0	78.0	0.0	4.8
10	13.4	18.0	91.0	61.0	0.0	0.0
11	12.5	21.0	93.0	61.0	0.0	2.0
12	12.4	22.0	95.0	62.0	0.0	4.5
13	9.9	21.0	93.0	67.0	0.0	2.4
14	7.9	20.5	95.0	61.0	0.0	3.6
15	7.3	20.2	97.0	75.0	0.0	3.1
16	6.0	17.0	97.0	54.0	0.0	0.0
17	6.4	21.8	97.0	49.0	0.0	5.2
18	7.0	24.5	94.0	43.0	0.0	7.7

19	6.4	24.6	94.0	39.0	0.0	8.1
20	5.4	24.0	97.0	56.0	0.0	7.8
21	5.5	19.0	97.0	55.0	0.0	2.6
22	6.9	23.0	91.0	45.0	0.0	4.1
23	7.9	25.0	92.0	48.0	0.0	7.5
24	8.9	25.2	95.0	52.0	0.0	6.8
25	9.4	25.0	95.0	55.0	0.0	6.6
26	8.0	24.0	94.0	50.0	11.2	4.2
27	6.8	22.2	91.0	55.0	0.0	8.4
28	7.8	22.0	92.0	55.0	0.0	7.7
29	11.8	21.5	93.0	68.0	0.0	4.8
30	9.4	20.5	95.0	52.0	0.0	3.7
31	7.5	22.2	94.0	52.0	0.0	6.2
01.01.17	9.0	23.5	95.0	49.0	0.0	6.4
2	10.4	24.5	79.0	39.0	0.0	8.4
3	7.9	25.8	92.0	42.0	0.0	8.7
4	8.0	24.5	94.0	52.0	0.0	8.6
5	8.7	22.0	97.0	60.0	0.0	7.7
6	10.4	20.2	95.0	76.0	0.0	3.9
7	11.0	18.0	93.0	93.0	Trace	0.6
8	7.0	14.0	94.0	54.0	13.0	0.0
9	7.9	21.5	83.0	49.0	0.0	7.6
10	4.8	21.0	93.0	60.0	0.0	7.0
11	3.3	18.2	93.0	45.0	0.0	8.1
12	1.3	17.5	100.0	52.0	0.0	8.2
13	2.9	17.8	93.0	52.0	0.0	7.3
14	2.8	17.5	93.0	53.0	0.0	5.4
15	8.9	20.0	92.0	39.0	0.0	6.1
16	6.4	21.5	97.0	48.0	0.0	6.4
17	9.3	21.5	93.0	78.0	0.0	5.4
18	7.9	14.0	94.0	80.0	0.0	0.0
19	6.0	15.0	97.0	53.0	0.0	1.9
20	4.2	21.0	97.0	55.0	0.0	5.5
21	6.2	21.3	97.0	57.0	0.0	5.9
22	8.3	19.0	97.0	59.0	0.0	1.7
23	7.0	22.4	97.0	42.0	0.0	4.9
24	7.4	24.5	94.0	53.0	0.0	8.7
25	9.1	24.4	92.0	47.0	0.0	8.0
26	8.0	25.0	80.0	50.0	0.0	4.4
27	12.9	25.5	95.0	83.0	27.6	7.4
28	7.0	17.2	91.0	53.0	19.8	1.7
29	11.9	20.5	86.0	77.0	0.0	7.6
30	9.4	16.9	97.0	61.0	0.0	0.0
31	10.3	21.0	93.0	60.0	0.0	5.0
01.02.17	7.4	21.5	94.0	57.0	0.0	4.7
2	8.4	22.0	94.0	49.0	0.0	8.6
3	7.7	23.0	92.0	57.0	0.0	4.4
4	10.5	23.4	95.0	57.0	0.0	7.0
5	11.3	22.5	88.0	66.0	0.0	1.1
6	11.9	23.0	91.0	49.0	Trace	0.9
7	9.3	24.8	95.0	52.0	0.0	8.5
8	8.9	22.6	95.0	41.0	0.0	7.2
9	7.7	24.0	94.0	40.0	0.0	6.6
10	4.9	22.4	91.0	40.0	0.0	9.1
11	5.4	22.9	91.0	38.0	0.0	7.8
12	7.9	24.5	94.0	45.0	0.0	8.5
13	8.4	24.7	92.0	43.0	0.0	9.1
14	7.0	25.2	89.0	51.0	0.0	8.6
15	8.9	24.4	92.0	50.0	0.0	8.0

16	10.8	25.4	93.0	50.0	0.0	7.1
17	11.4	26.5	86.0	51.0	0.0	6.6
18	11.0	25.5	88.0	51.0	0.0	2.0
19	12.2	28.0	88.0	54.0	0.0	7.3
20	12.8	27.8	95.0	42.0	0.0	5.8
21	14.9	29.5	89.0	50.0	0.0	6.6
22	11.1	26.8	95.0	43.0	0.0	2.3
23	8.3	26.5	92.0	39.0	0.0	8.8
24	6.6	25.0	91.0	37.0	0.0	9.7
25	7.2	24.6	91.0	47.0	0.0	9.9
26	7.3	25.5	91.0	44.0	0.0	9.3
27	8.3	25.0	92.0	46.0	0.0	8.6
28	7.3	27.0	92.0	41.0	0.0	8.8

#### PASIGHAT

Date	Temperature (°C)	Relative Humidity (%)		Rainfall (mm)
	Max.	Min.	Max.	
24.10.16	31.0	59.0	70.0	-
25	28.5	63.0	69.0	-
26	30.5	63.0	68.0	-
27	28.5	68.0	70.0	-
28	27.0	63.0	70.0	-
29	-	-	-	-
30	-	-	-	-
31	29.5	-	-	-
01.11.16	29.0	59.0	72.0	-
2	30.0	63.0	70.0	-
3	29.8	63.0	74.0	-
4	-	-	-	-
5	29.0	63.0	86.0	-
6	-	-	-	-
7	24.8	78.0	78.0	-
8	26.8	79.0	79.0	-
9	27.5	70.0	79.0	-
10	29.8	56.0	66.0	-
11	28.5	56.0	69.0	-
12	-	-	-	-
13	-	-	-	-
14	-	-	-	-
15	29.0	63.0	74.0	-
16	29.5	63.0	67.0	-
17	28.5	63.0	65.0	-
18	28.0	63.0	69.0	-
19	28.0	63.0	69.0	-
20	-	-	-	-
21	27.5	63.0	69.0	-
22	26.5	63.0	75.0	-
23	28.0	63.0	67.0	-
24	26.0	63.0	75.0	-
25	-	-	-	-
26	-	-	-	-
27	-	-	-	-
28	28.5	63.0	67.0	-
29	27.5	63.0	69.0	-
30	27.5	63.0	69.0	-
01.12.16	-	-	-	-
2	-	-	-	-

3	26.8	60.0	69.0	-
4	-	-	-	-
5	25.8	60.0	75.0	-
6	25.8	60.0	69.0	-
7	25.3	60.0	68.0	-
8	26.0	60.0	78.0	-
9	26.0	56.0	78.0	-
10	-	-	-	-
11	-	-	-	-
12	26.0	56.0	73.0	-
13	-	-	-	-
14	26.0	56.0	75.0	-
15	26.0	56.0	75.0	-
16	26.0	55.0	69.0	-
17	26.5	55.0	69.0	-
18	-	-	-	-
19	26.5	55.0	69.0	-
20	-	-	-	-
21	26.5	55.0	69.0	-
22	26.0	55.0	69.0	-
23	26.5	55.0	69.0	-
24	-	-	-	-
25	-	-	-	-
26	18.5	88.0	88.0	7.6
27	19.0	83.0	84.0	3.0
28	-	-	-	-
29	25.5	55.0	78.0	-
30	25.3	55.0	68.0	-
31	25.3	55.0	68.0	-

#### PATNA

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
12.01.16	0.0	24.1	70.0	96.0	0.0	
2	16.1	27.0	61.0	96.0	0.0	
3	16.9	22.2	84.0	97.0	0.0	
4	17.2	22.6	68.0	85.0	0.0	
5	13.3	19.5	78.0	93.0	0.0	
6	10.2	21.3	70.0	97.0	0.0	
7	12.4	20.4	66.0	96.0	0.0	
8	12.7	20.3	68.0	94.0	0.0	
9	13.6	21.4	60.0	80.0	0.0	
10	9.7	13.8	91.0	96.0	0.0	
11	8.9	13.7	92.0	96.0	0.0	
12	12.4	16.3	83.0	97.0	0.0	
13	14.0	19.1	71.0	83.0	0.0	
14	9.1	17.2	84.0	96.0	0.0	
15	10.2	20.2	73.0	93.0	0.0	
16	9.7	19.0	73.0	95.0	0.0	
17	8.6	17.6	81.0	100.0	0.0	
18	9.0	26.1	72.0	90.0	0.0	
19	10.3	24.2	44.0	91.0	0.0	5.0
20	12.5	23.2	46.0	75.0	0.0	2.5
21	9.7	22.6	54.0	95.0	0.0	
22	9.5	20.8	63.0	92.0	0.0	
23	11.8	22.7	66.0	98.0	0.0	
24	11.7	25.4	57.0	93.0	0.0	2.1

25	12.7	25.3	64.0	93.0	0.0	
26	12.4	21.0	87.0	98.0	0.0	
27	14.6	16.7	86.0	96.0	1.0	
28	11.4	21.0	63.0	93.0	0.0	0.0
29	10.2	17.9	80.0	95.0	0.0	
30	11.2	17.6	85.0	100.0	0.0	
31	12.2	16.6	83.0	98.0	0.0	
01.01.17	13.2	21.2	78.0	91.0	0.0	
2	12.0	18.1	89.0	98.0	0.0	
3	12.0	20.5	75.0	95.0	0.0	
4	13.0	17.5	81.0	98.0	0.0	
5	10.2	18.2	75.0	93.0	0.0	50.0
6	8.5	18.2	76.0	100.0	0.0	
7	9.9	19.7	69.0	83.0	0.0	4.1
8	13.0	22.4	51.0	90.0	0.0	2.3
9	10.6	23.3	52.0	93.0	0.0	0.3
10	14.0	24.3	48.0	91.0	0.0	4.3
11	11.3	20.2	39.0	72.0	0.0	7.4
12	4.6	18.7	33.0	72.0	0.0	8.3
13	4.3	18.3	33.0	88.0	0.0	7.3
14	4.4	18.1	37.0	86.0	0.0	6.6
15	4.9	21.0	43.0	79.0	0.0	6.2
16	8.6	22.6	40.0	79.0	0.0	5.2
17	9.2	24.5	37.0	88.0	0.0	5.1
18	9.0	24.0	49.0	87.0	0.0	4.5
19	9.3	24.0	32.0	81.0	0.0	7.5
20	11.6	24.8	34.0	84.0	0.0	8.1
21	9.5	23.3	39.0	80.0	0.0	
22	7.8	23.0	51.0	89.0	0.0	6.2
23	12.0	25.3	45.0	87.0	0.0	6.5
24	12.7	25.3	50.0	87.0	0.0	6.3
25	10.6	26.3	47.0	95.0	0.0	6.1
26	10.7	26.3	47.0	91.0	0.0	4.6
27	15.2	22.8	54.0	86.0	0.0	0.1
28	14.1	22.0	50.0	87.0	0.0	7.0
29	13.3	21.7	53.0	91.0	0.0	6.5
30	12.0	17.9	74.0	81.0	0.0	0.0
31	9.5	21.5	69.0	93.0	0.0	2.4
01.02.17	11.7	19.7	69.0	93.0	0.0	0.0
2	8.5	20.9	65.0	95.0	0.0	1.2
3	9.9	22.7	51.0	97.0	0.0	5.3
4	9.7	25.0	53.0	97.0	0.0	5.3
5	9.8	28.0	36.0	91.0	0.0	7.3
6	10.8	28.2	38.0	81.0	0.0	7.0
7	14.9	25.3	40.0	83.0	0.0	8.3
8	10.8	24.7	37.0	76.0	0.0	9.2
9	8.9	25.3	38.0	84.0	0.0	8.1
10	13.9	25.3	31.0	79.0	0.0	7.3
11	8.5	25.3	29.0	79.0	0.0	8.1
12	11.3	25.7	41.0	64.0	0.0	3.2
13	12.7	27.7	45.0	84.0	0.0	6.1
14	13.6	27.4	41.0	89.0	0.0	5.1
15	11.2	26.0	46.0	87.0	0.0	5.2
16	11.9	25.6	48.0	80.0	0.0	6.2
17	12.1	27.3	43.0	91.0	0.0	5.3
18	13.6	28.6	55.0	92.0	0.0	5.1
19	14.6	27.9	55.0	92.0	0.0	4.6
20	16.5	29.0	51.0	91.0	0.0	5.3
21	15.8	32.1	37.0	82.0	0.0	8.3

22	16.6	26.7	42.0	80.0	0.0	8.4
23	13.9	27.5	24.0	56.0	0.0	9.1
24	12.6	24.0	31.0	57.0	0.0	9.3
25	12.8	25.3	33.0	62.0	0.0	9.1
26	12.6	27.9	30.0	70.0	0.0	8.6
27	11.6	28.3	21.0	71.0	0.0	9.1
28	11.5	28.7	30.0	73.0	0.0	8.3
01.03.17	12.9	31.0	29.0	70.0	0.0	8.3
2	14.5	32.4	27.0	85.0	0.0	8.1
3	18.2	31.5	31.0	59.0	0.0	7.2
4	16.9	31.6	29.0	68.0	0.0	7.4
5	16.6	31.6	24.0	67.0	0.0	8.2
6	15.1	29.3	22.0	60.0	0.0	9.4
7	12.7	29.4	22.0	56.0	0.0	9.0
8	12.8	30.6	34.0	84.0	0.0	8.4
9	17.8	28.6	45.0	70.0	0.0	2.3
10	16.6	29.3	51.0	80.0	0.0	4.4
11	17.4	24.6	58.0	89.0	0.0	8.1
12	17.2	26.4	27.0	96.0	0.0	6.2
13	12.9	25.1	25.0	61.0	0.0	9.2
14	10.2	27.6	22.0	72.0	0.0	9.3
15	13.1	28.0	27.0	65.0	0.0	9.2

## PUNE

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
13.07.16	22.0	26.6	81.0	90.0	3.6	4.4
14	22.3	28.2	71.0	93.0	1.3	10.1
15	22.1	28.3	86.0	93.0	0.6	5.5
16	21.8	26.3	60.0	84.0	0.5	5.1
17	23.3	27.3	77.0	84.0	0.0	7.2
18	22.2	28.8	78.0	92.0	0.8	6.7
19	21.6	26.2	79.0	87.0	0.8	6.4
20	21.8	26.6	92.0	92.0	0.4	9.1
21	21.8	27.3	76.0	88.0	2.4	7.9
22	22.5	27.7	82.0	87.0	0.0	7.1
23	21.8	25.3	65.0	88.0	2.3	4.9
24	21.5	28.5	58.0	88.0	0.0	5.2
25	22.8	30.3	60.0	85.0	0.0	6.5
26	22.8	30.7	68.0	85.0	0.0	7.0
27	22.7	30.3	69.0	82.0	0.6	7.0
28	22.2	27.3	66.0	85.0	0.2	6.6
29	21.5	28.6	62.0	91.0	1.3	6.6
30	22.0	28.3	90.0	85.0	2.0	7.7
31	22.2	27.1	90.0	87.0	2.5	7.0
01.08.16	21.3	27.7	93.0	88.0	6.0	9.1
2	21.3	25.3	78.0	87.0	15.0	9.9
3	21.3	26.0	93.0	97.0	39.6	9.2
4	22.1	24.5	81.0	90.0	74.6	7.3
5	22.5	27.5	95.0	93.0	2.9	9.9
6	22.1	24.5	80.0	93.0	45.8	7.4
7	22.6	26.5	81.0	90.0	1.7	9.4
8	21.7	26.0	78.0	85.0	8.6	4.7
9	21.7	26.3	72.0	88.0	4.4	4.7
10	21.4	28.1	92.0	98.0	8.2	8.1
11	21.6	25.8	80.0	88.0	7.7	5.7
12	21.5	27.2	83.0	95.0	2.2	6.5

13	22.5	28.2	68.0	87.0	0.0	7.3
14	22.3	28.5	74.0	88.0	0.1	8.9
15	22.0	28.3	67.0	82.0	0.0	8.1
16	22.0	28.5	66.0	79.0	0.0	11.3
17	22.2	28.5	63.0	75.0	0.0	11.3
18	22.1	29.1	68.0	87.0	0.0	9.4
19	21.4	28.9	66.0	80.0	0.1	8.4
20	21.9	29.3	59.0	78.0	0.0	9.4
21	22.1	29.3	64.0	779.0	0.0	8.7
22	21.5	28.9	83.0	87.0	0.4	77.3
23	21.8	29.1	73.0	93.0	1.8	5.1
24	21.3	27.7	81.0	977.0	6.9	4.8
25	22.4	27.5	74.0	84.0	3.4	4.1
26	21.9	27.3	79.0	85.0	0.0	6.1
27	22.0	27.7	83.0	90.0	0.4	6.4
28	22.5	26.9	90.0	88.0	0.0	4.6
29	22.4	27.5	69.0	88.0	0.3	5.5
30	22.3	28.5	72.0	90.0	0.0	5.9
31	22.4	29.0	74.0	85.0	0.0	7.4
01.09.16	22.2	29.5	74.0	82.0	0.0	5.9
2	21.4	27.4	67.0	95.0	0.4	4.1
3	21.1	27.4	81.0	88.0	0.0	5.7
4	21.0	28.0	61.0	83.0	1.4	5.6
5	19.7	28.9	57.0	83.0	0.0	7.4
6	20.1	29.3	56.0	85.0	0.0	7.5
7	19.7	29.6	57.0	86.0	0.0	7.4
8	19.8	29.6	64.0	83.0	0.1	7.6
9	20.2	29.3	55.0	83.0	0.0	6.1
10	20.1	30.0	57.0	85.0	0.0	6.3
11	20.6	29.1	70.0	82.0	0.0	4.4
12	21.4	28.2	54.0	88.0	0.0	5.7
13	21.1	29.9	60.0	80.0	0.0	5.7
14	22.5	30.3	71.0	82.0	0.0	5.7
15	21.2	28.6	92.0	91.0	4.5	4.7
16	22.5	24.5	87.0	93.0	2.8	4.1
17	21.9	26.3	90.0	97.0	10.1	2.1
18	22.5	26.5	86.0	97.0	16.9	2.1
19	21.8	27.5	72.0	93.0	3.3	6.6
20	21.7	27.8	82.0	92.0	0.3	8.2
21	21.0	25.6	81.0	88.0	2.6	5.8
22	22.1	27.6	80.0	92.0	4.1	4.0
23	21.9	29.0	91.0	95.0	2.2	3.0
24	22.4	29.3	80.0	95.0	2.9	3.1
25	21.5	28.8	76.0	90.0	0.0	3.2
26	21.5	28.8	73.0	90.0	0.0	5.6
27	20.9	29.5	67.0	90.0	0.0	5.6
28	20.1	30.6	61.0	91.0	0.0	4.4
29	21.0	30.5	66.0	93.0	5.0	5.2
30	19.8	28.7	63.0	84.0	0.0	4.9
01.10.16	21.2	28.6	91.0	83.0	0.0	5.9
2	20.4	25.7	93.0	93.0	31.6	5.3
3	20.8	25.6	87.0	95.0	1.2	3.6
4	21.0	25.6	78.0	87.0	0.9	3.8
5	20.9	26.3	73.0	91.0	0.0	4.9
6	18.8	28.3	66.0	81.0	0.7	5.3
7	19.4	17.8	63.0	85.0	0.0	4.7
8	20.3	30.2	56.0	90.0	0.0	4.6
9	19.8	30.9	56.0	90.0	0.0	3.8
10	21.3	31.3	55.0	90.0	11.9	2.9

**RAIPUR**

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Sun shine (hrs)
	Min.	Max.	Min.	Max.		
Nov 05-11	15.7	30.2	29.0	88.0	0.0	8.5
12-18	14.4	29.0	35.0	89.0	0.0	7.8
19-25	11.3	30.0	25.0	89.0	0.0	8.5
26-02	13.0	30.7	27.0	88.0	0.0	8.5
Dec 03-09	14.3	28.9	39.0	90.0	0.0	7.4
10-16	11.9	28.8	29.0	83.0	0.0	8.1
17-23	8.6	27.5	24.0	87.0	0.0	8.5
24-31	9.9	28.2	26.0	86.0	0.0	7.4
Jan 01-07	12.2	28.6	32.0	90.0	0.0	6.4
08-14	11.9	27.2	35.0	85.0	5.6	6.5
15-21	11.8	28.9	27.0	85.0	0.0	8.0
22-28	14.3	29.9	29.0	83.0	0.0	7.7
29-04	12.0	30.4	26.0	80.0	0.0	9.4
Feb 05-11	14.1	32.2	26.0	81.0	0.0	9.3
12-18	15.8	31.0	31.0	80.0	0.0	6.8
19-25	15.5	34.1	17.0	68.0	0.0	10.1
26-04	15.8	34.3	15.0	73.0	0.0	9.7
Mar 05-11	19.2	33.0	36.0	69.0	5.5	6.7
12-18	17.0	32.9	18.0	58.0	0.0	8.9
19-25	19.7	36.5	15.0	63.0	0.0	9.2
26-01	23.0	35.9	13.0	58.0	0.0	8.9
Apr 02-08	26.6	41.4	17.0	45.0	0.0	8.3
09-15	22.0	40.7	9.0	36.0	0.0	9.4
16-22	26.7	42.6	10.0	41.0	0.0	9.5
23-29	24.9	42.3	8.0	37.0	0.0	10.3
30-06	27.6	42.0	14.0	39.0	0.0	9.2

**SRINAGAR**

Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min.	Max.	Min.	Max.	
01.03.16	0.5	19.4	23.0	88.0	0.0
2	0.0	18.0	43.0	73.0	0.0
3	3.0	21.0	39.0	87.0	0.0
4	2.0	20.0	40.0	87.0	0.0
5	2.5	16.5	52.0	87.0	0.0
6	2.0	14.0	50.0	92.0	2.0
7	-0.5	17.5	48.0	86.0	2.0
8	0.5	19.0	42.0	94.0	0.0
9	1.0	20.0	40.0	82.0	0.0
10	2.5	20.0	35.0	74.0	0.0
11	8.0	9.5	92.0	81.0	2.4
12	3.4	10.0	88.0	94.0	23.9
13	5.5	9.0	84.0	92.0	8.8
14	4.5	13.0	66.0	87.0	7.0
15	2.1	13.5	67.0	94.0	14.8
16	1.4	14.5	58.0	87.0	0.0
17	2.5	4.0	91.0	97.0	11.6
18	2.0	7.5	87.0	94.0	20.8
19	-0.6	10.5	74.0	94.0	54.2
20	3.5	7.0	87.0	92.0	6.6



21	2.0	14.0	64.0	86.0	8.4
22	-0.5	16.5	45.0	89.0	0.0
23	0.6	15.5	48.0	74.0	0.0
24	3.5	12.0	77.0	84.0	0.0
25	5.0	10.0	93.0	87.0	1.4
26	5.9	16.5	71.0	90.0	27.6
27	5.0	18.0	63.0	87.0	1.8
28	2.5	18.5	53.0	80.0	1.0
29	5.4	21.5	42.0	68.0	0.0
30	5.5	24.5	35.0	78.0	0.0
31	5.5	16.0	74.0	72.0	0.0
01.04.16	3.5	17.0	55.0	88.0	0.0
2	8.8	13.5	82.0	86.0	6.6
3	8.0	16.5	80.0	93.0	5.6
4	8.0	12.0	93.0	95.0	1.0
5	7.5	16.0	84.0	90.0	4.6
6	7.5	13.5	89.0	95.0	0.0
7	6.5	15.0	89.0	94.0	15.5
8	3.0	18.5	73.0	87.0	11.4
9	7.0	14.5	78.0	84.0	6.2
10	6.0	16.5	71.0	93.0	2.6
11	7.4	11.5	89.0	97.0	8.0
12	5.0	19.5	53.0	88.0	5.4
13	7.0	23.0	47.0	93.0	0.0
14	5.0	24.0	69.0	90.0	0.0
15	5.0	21.0	75.0	84.0	0.0
16	6.0	24.5	56.0	78.0	0.0
17	11.9	13.5	79.0	96.0	1.8
18	9.0	20.0	74.0	89.0	30.4
19	7.1	15.5	80.0	89.0	0.0
20	6.4	20.0	58.0	93.0	3.0
21	7.0	21.5	68.0	89.0	0.0
22	7.4	18.0	79.0	88.0	7.4
23	4.0	18.0	89.0	93.0	0.2
24	2.0	20.0	66.0	81.0	7.1
25	3.3	22.0	63.0	89.0	0.0
26	4.5	23.0	42.0	75.0	0.0
27	6.8	19.0	58.0	84.0	0.0
28	3.0	22.0	53.0	88.0	0.0
29	3.5	25.5	35.0	71.0	0.0
30	4.5	27.0	42.0	70.0	0.0
01.05.16	6.0	28.9	40.0	66.0	0.0
2	6.0	28.5	42.0	77.0	0.0
3	9.0	23.5	61.0	71.0	0.0
4	11.5	16.6	90.0	90.0	1.0
5	10.5	19.0	71.0	89.0	7.2
6	7.0	21.5	59.0	83.0	3.2
7	7.5	27.0	45.0	90.0	0.0
8	9.0	28.5	36.0	80.0	0.0
9	10.0	26.5	56.0	83.0	0.0
10	10.0	26.0	45.0	81.0	0.0
11	11.0	27.0	48.0	81.0	0.0
12	11.5	24.0	63.0	78.0	11.5
13	8.0	22.5	64.0	86.0	0.0
14	8.0	22.0	71.0	80.0	0.0
15	11.0	25.0	54.0	90.0	8.0
16	10.5	25.5	50.0	92.0	0.0
17	9.0	27.0	46.0	64.0	0.0
18	9.5	30.0	43.0	74.0	0.0

19	9.5	31.5	33.0	72.0	4.0
20	11.0	32.5	40.0	71.0	0.0
21	11.0	32.5	36.0	71.0	0.0
22	11.5	32.5	50.0	78.0	0.0
23	12.5	25.0	56.0	65.0	0.0
24	12.0	24.0	80.0	90.0	8.3
25	11.0	24.0	55.0	86.0	18.5
26	10.0	26.0	57.0	82.0	0.0
27	10.5	29.0	41.0	82.0	0.0
28	12.0	29.5	42.0	77.0	0.0
29	10.0	28.0	40.0	73.0	0.0
30	9.0	25.5	71.0	73.0	0.0
31	7.5	26.0	47.0	82.0	2.1
01.06.16	9.7	30.0	34.0	81.0	0.0
2	14.9	30.5	44.0	66.0	0.0
3	15.2	30.0	44.0	74.0	0.0
4	12.5	30.0	44.0	64.0	0.0
5	11.5	28.5	47.0	66.0	0.0
6	11.5	31.0	36.0	69.0	0.0
7	12.5	31.5	30.0	73.0	0.0
8	10.5	28.0	55.0	73.0	3.4
9	12.5	30.5	39.0	86.0	0.0
10	15.2	29.5	37.0	73.0	0.0
11	13.2	27.5	57.0	78.0	0.0
12	14.0	27.0	45.0	74.0	0.0
13	12.0	30.0	39.0	73.0	0.0
14	14.0	30.0	36.0	67.0	0.0
15	17.4	32.5	48.0	69.0	
16	15.5	32.0	67.0	90.0	0.6
17	12.0	23.5	52.0	81.0	0.0
18	13.5	31.0	35.0	82.0	0.0
19	15.0	30.5	44.0	75.0	0.0
20	17.0	30.5	47.0	68.0	0.0
21	18.0	31.5	54.0	83.0	0.0
22	15.4	29.0	48.0	67.0	0.0
23	14.0	30.0	53.0	67.0	0.0
24	12.5	33.0	44.0	67.0	0.0
25	13.5	32.5	56.0	63.0	0.0
26	15.0	33.5	56.0	68.0	0.0
27	16.5	32.5	63.0	69.0	0.0
28	17.0	29.5	64.0	83.0	0.0
29	18.0	33.0	55.0	80.0	0.0
30	17.0	34.5	42.0	69.0	0.0
01.07.16	17.4	34.0	38.0	72.0	0.0
2	17.0	34.0	36.0	72.0	0.0
3	18.0	29.0	43.0	80.0	0.0
4	17.0	30.5	38.0	83.0	0.0
5	15.0	33.0	44.0	75.0	0.0
6	14.5	32.0	53.0	81.0	5.6
7	14.4	31.5	39.0	75.0	0.0
8	15.0	34.0	35.0	68.0	0.0
9	15.8	27.5	56.0	65.0	6.0
10	16.5	30.0	42.0	91.0	0.0
11	16.0	31.5	34.0	82.0	0.0
12	17.0	31.0	53.0	75.0	0.0
13	18.1	33.0	54.0	75.0	0.0
14	20.0	30.0	58.0	75.0	0.0
15	19.5	31.5	48.0	82.0	0.0
16	19.0	25.0	69.0	77.0	0.0

17	17.5	28.0	51.0	82.0	0.0
18	16.5	25.0	68.0	86.0	18.4
19	15.5	30.0	42.0	85.0	11.8
20	14.0	32.5	34.0	82.0	4.4
21	15.0	33.5	40.0	78.0	0.0
22	16.0	29.5	51.0	82.0	0.0
23	14.0	32.0	39.0	78.0	0.0
24	17.5	33.0	39.0	82.0	0.0
25	18.5	31.5	57.0	82.0	0.0
26	18.0	32.5	69.0	88.0	0.0
27	16.5	18.0	94.0	90.0	18.0
28	16.2	27.0	56.0	90.0	43.2
29	16.5	31.0	42.0	90.0	0.0
30	16.5	28.0	51.0	88.0	0.0
31	16.5	30.0	53.0	88.0	0.0
01.08.16	15.5	32.5	41.0	74.0	0.0
2	17.0	25.5	76.0	91.0	0.0
3	18.0	28.5	57.0	90.0	0.0
4	18.0	32.0	42.0	91.0	1.6
5	17.0	32.2	44.0	78.0	0.0
6	18.0	33.0	44.0	91.0	0.0
7	20.5	22.0	91.0	88.0	0.0
8	17.0	29.0	58.0	89.0	0.0
9	16.5	30.0	68.0	82.0	30.8
10	17.4	24.5	53.0	86.0	0.0
11	17.0	28.0	37.0	82.0	0.0
12	17.0	30.5	39.0	88.0	0.0
13	15.0	31.5	40.0	91.0	0.0
14	15.0	16.2	42.0	82.0	0.0
15	13.0	22.0	62.0	76.0	0.0
16	12.0	30.5	56.0	77.0	0.0
17	14.5	29.0	56.0	90.0	0.4
18	13.5	30.5	52.0	81.0	0.0
19	15.0	32.0	36.0	88.0	0.0
20	13.0	33.5	42.0	91.0	0.0
21	15.5	31.5	44.0	75.0	0.0
22	11.0	25.5	58.0	87.0	5.4
23	14.0	29.5	43.0	90.0	0.0
24	17.0	29.5	58.0	73.0	0.0
25	16.0	23.0	84.0	91.0	0.0
26	15.0	23.5	91.0	91.0	5.0
27	15.0	23.0	84.0	90.0	3.0
28	15.0	23.0	89.0	96.0	30.0
29	14.5	17.5	83.0	94.0	22.0
30	14.5	21.5	61.0	98.0	0.0
31	15.0	26.5	60.0	87.0	0.0