

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

FINAL RESEARCH PROJECT REPORT (RPP- III)

(For Guidelines Refer ANNEXURE – XI(G))

1.	Institute Project Code	:	IXX13797
2.	Project Title	:	Enhancing Productivity and Profitability of Major Hill Crops through Efficient Resource Utilization
3.	Project Duration	:	4 years (Initially 3 years)
	Date of Start	:	01-04-2017
	Likely Date of Completion	:	31-03-2020 <i>but extended upto 31-03-2021</i>

Experiment No. 1: Effect of tillage, mulching and sowing methods on productivity of rainfed fingermillet-wheat cropping system (Item No. 2017/K/154, 2017/R/96, 2018/K/160, 2018/R/94, 2019/K/140, 2019/R/98)

Table 1: Seed yield and straw yield of fingermillet under different treatments under tillage, mulching and sowing methods

Treatment	Grain yield (kg/ha)				Straw yield (kg/ha)			
	2017	2018	2019	Mean	2017	2018	2019	Mean
<i>Tillage</i>								
Zero Tillage (ZT)	2137	2042	2665	2281	3000	2698	3177	2958
Conventional Tillage (CT)	2245	2082	2769	2365	3161	2736	3385	3094
Mean	2191	2062	2717	2323	3081	2717	3281	3026
CD (P=0.05)	NS	202	NS	-	NS	287	NS	-
<i>Mulching</i>								
No mulch	2089	1929	2549	2189	2969	2557	3090	2872
Mulch	2293	2195	2885	2458	3192	2877	3473	3181
Mean	2191	2062	2717	2323	3081	2717	3281	3026
CD (P=0.05)	173	202	236		NS	287	290	
<i>Sowing method</i>								
Direct sowing in lines	1985	1853	2353	2064	2832	2492	2874	2733
Transplanting	2397	2272	3081	2583	3329	2942	3689	3320
Mean	2191	2062	2717	2323	3081	2717	3281	3026
CD (P=0.05)	173	202	236	-	229	287	290	-
<i>Farmers' practice</i>	1610	1684	2293	1862	3468	2447	4113	3343

Table 2: Yield and economics of fingermillet under different treatment combinations (Kharif 2017)

Treatment	Seed yield (kg/ha)	Straw yield (kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
ZT-NM-LS	1841	2662	31856	45621	13765	1.43
ZT-NM-TP	2221	3104	30209	54609	24400	1.81
ZT-M-LS	2022	2845	31593	49806	18213	1.58

ZT-M-TP	2464	3389	34826	60373	25547	1.73
CT-NM-LS	1947	2813	40176	48246	8070	1.20
CT-NM-TP	2346	3297	38555	57757	19202	1.50
CT-M-LS	2129	3007	39913	52473	12560	1.32
CT-M-TP	2558	3526	43129	62712	19583	1.45
Farmer practice	1610	3468	45031	44461	-570	0.99

Table 3: Yield & economics of finger millet under different treatment combinations (Kharif 2018)

Treatment	Seed yield (kg/ha)	Straw yield (kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
ZT-NM-LS	1712	2334	34409	59524	25115	1.73
ZT-NM-TP	2092	2741	32880	72243	39363	2.20
ZT-M-LS	1951	2590	34765	67520	32755	1.94
ZT-M-TP	2413	3128	38364	83208	44844	2.17
CT-NM-LS	1765	2400	43082	61332	18250	1.43
CT-NM-TP	2147	2752	41557	73883	32326	1.78
CT-M-LS	1983	2644	43393	68675	25282	1.58
CT-M-TP	2435	3146	46969	83904	36935	1.79
Farmer practice	1684	2447	48127	59193	11066	1.23

Table 4: Yield & economics of finger millet under different treatment combinations (Kharif 2019)

Treatment	Seed yield (kg/ha)	Straw yield (kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
ZT-NM-LS	2136	2584	37280	78924	41644	2.12
ZT-NM-TP	2856	3380	36511	105174	68663	2.88
ZT-M-LS	2445	2937	37690	90245	52554	2.39
ZT-M-TP	3224	3808	42287	118683	76396	2.81
CT-NM-LS	2263	2818	46525	83975	37449	1.81
CT-NM-TP	2941	3578	45659	108753	63094	2.38
CT-M-LS	2566	3157	46920	95024	48104	2.02
CT-M-TP	3304	3989	51424	122036	70612	2.37
Farmer practice	2293	4113	52275	90752	38476	1.73

Table 5: Three years mean yield & economics of finger millet under different treatment combinations (Mean of Kharif 2017, 2018 & 2019)

Treatment	Seed yield (kg/ha)	Straw yield (kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
ZT-NM-LS	1896	2527	34515	61356	26841	1.76
ZT-NM-TP	2390	3075	33200	77342	44142	2.30
ZT-M-LS	2139	2791	34683	69190	34507	1.97
ZT-M-TP	2700	3442	38492	87421	48929	2.24
CT-NM-LS	1992	2677	43261	64518	21256	1.48
CT-NM-TP	2478	3209	41924	80131	38207	1.89
CT-M-LS	2226	2936	43409	72057	28649	1.64
CT-M-TP	2766	3554	47174	89551	42377	1.87

Farmer practice	1862	3343	48478	64802	16324	1.32
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Table 6: Seed yield and straw yield of wheat under different treatments under tillage, mulching and sowing methods

Treatment	Grain yield (kg/ha)				Straw yield (kg/ha)			
	2017-18	2018-19	2019-20	Mean	2017-18	2018-19	2019-20	Mean
Tillage								
Zero Tillage (ZT)	1659	2551	3389	2533	1924	2703	5493	3373
Conventional Tillage (CT)	1569	2474	3264	2436	1853	2680	5307	3280
Mean	1614	2512	3327	2484	1889	2692	5400	3327
CD (P=0.05)	NS	NS	NS		NS	227	NS	
Mulching								
No mulch	1451	2420	3141	2337	1717	2631	5124	3157
Mulch	1778	2604	3512	2631	2060	2752	5676	3496
Mean	1614	2512	3327	2484	1889	2692	5400	3327
CD (P=0.05)	152	NS	299		182	227	386	
Sowing method								
Direct sowing in lines	1548	2405	3181	2378	1830	2609	5188	3209
Seed Drill Sowing	1681	2619	3473	2591	1947	2774	5612	3444
Mean	1614	2512	3327	2484	1889	2692	5400	3327
CD (P=0.05)	NS	204	NS		NS	227	386	
Farmers' practice	1320	2096	2957	2124	1663	2404	5142	3070

Table 7 : Yield & economics of wheat under different treatment combinations (Rabi 2017-18)

Treatment	Seed yield (kg/ha)	Straw yield (kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
ZT-NM-LS	1435	1709	18572	32586	14014	1.76
ZT-NM-SD	1552	1826	19254	35145	15891	1.83
ZT-M-LS	1737	2000	26090	39135	13045	1.50
ZT-M-SD	1912	2162	26316	42909	16594	1.63
CT-NM-LS	1364	1642	25939	31047	5108	1.20
CT-NM-SD	1452	1693	26053	32811	6758	1.26
CT-M-LS	1654	1970	32911	37569	4658	1.14
CT-M-SD	1806	2108	33107	40827	7721	1.23
Farmer practice	1320	1663	24669	30387	5738	1.23

Table 8: Yield & economics of wheat under different treatment combinations (Rabi 2018-19)

Treatment	Seed yield (kg/ha)	Straw yield (kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
ZT-NM-LS	2336	2543	23316	55062	31746	2.36
ZT-NM-SD	2510	2693	23554	58980	35427	2.50
ZT-M-LS	2553	2695	30584	59784	29200	1.95
ZT-M-SD	2803	2883	30924	65262	34338	2.11
CT-NM-LS	2323	2582	30596	55012	24416	1.80
CT-NM-SD	2512	2707	30854	59077	28224	1.91
CT-M-LS	2407	2616	37682	56713	19031	1.51
CT-M-SD	2652	2814	38016	62165	24148	1.64
Farmer practice	2096	2404	29268	49990	20722	1.71

Table 9: Yield & economics of wheat under different treatment combinations (Rabi 2019-20)

Treatment	Seed yield (kg/ha)	Straw yield (kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
ZT-NM-LS	3039	4967	25579	83334	57755	3.26
ZT-NM-SD	3314	5379	25971	90683	64712	3.49
ZT-M-LS	3408	5532	33618	93272	59655	2.77
ZT-M-SD	3795	6094	34170	103532	69362	3.03
CT-NM-LS	2994	4927	33180	82270	49089	2.48
CT-NM-SD	3218	5224	33500	88075	54574	2.63
CT-M-LS	3281	5325	41101	89780	48679	2.18
CT-M-SD	3564	5751	41504	97357	55853	2.35
Farmer practice	2957	2957	31955	82628	50672	2.59

Table 10: Mean yield & economics of wheat under different treatment combinations (Average of Rabi 2017-18, 2018-19 & 2019-20)

Treatment	Seed yield (kg/ha)	Straw yield (kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
ZT-NM-LS	2270	3073	22489	56994	34505	2.46
ZT-NM-SD	2459	3299	22926	61603	38677	2.61
ZT-M-LS	2566	3409	30097	64064	33967	2.07
ZT-M-SD	2837	3713	30470	70568	40098	2.26
CT-NM-LS	2227	3050	29905	56110	26204	1.83
CT-NM-SD	2394	3208	30136	59988	29852	1.93
CT-M-LS	2447	3304	37231	61354	24123	1.61
CT-M-SD	2674	3558	37542	66783	29241	1.74
Farmer practice	2124	2341	28631	54335	25711	1.84

Experiment No. 2: Effect of tillage and phosphorus management on wheat- soybean cropping system (Item No. 2017/K/155, 2017/R/98, 2018/K/161, 2018/R/95)**Table 11: Effect of tillage and phosphate solubilizing on soybean crop**

Treatment	Soybean yield (kg/ha)								
	2017			2018			Mean		
	CT	ZT	Mean	CT	ZT	Mean	CT	ZT	Mean
S ₁ (Control, NK only)	1583	1417	1500	1624	1785	1705	1604	1601	1603
S ₂ (NK + PSB)	1687	1667	1677	1809	1965	1887	1748	1816	1782
S ₃ : RDF (100% NPK) (from Rabi 2017-18)	-	-	-	2242	2452	2347	2242	2452	2347
S ₄ (NK + 75% P + PSB)	1913	1750	1832	2119	2325	2222	2016	2038	2027
S ₅ (NK + 100% P + PSB)	2170	2047	2109	2597	2752	2675	2384	2400	2392
S ₆ (NK + 125% P + PSB)	2347	2187	2267	2700	2862	2781	2524	2525	2524
S ₇ (NK + 150% P + PSB)	2417	2273	2345	2942	3125	3034	2680	2699	2690
Mean	2019	1890	1955	2290	2467	2379	2155	2179	2167

Table 12: Effect of tillage and phosphate solubilizing on wheat crop

Treatment	Soybean yield (kg/ha)								
	2017			2018			Mean		
	CT	ZT	Mean	CT	ZT	Mean	CT	ZT	Mean
S ₁ (Control, NK only)	2809	2952	2881	3060	3260	3160	2935	3106	3021
S ₂ (NK + PSB)	3012	3225	3119	3330	3540	3435	3171	3383	3277
S ₃ : RDF (100% NPK) (<i>from Rabi 2017-18</i>)	3552	3652	3602	3850	3950	3900	3701	3801	3751
S ₄ (NK + 75% P + PSB)	3452	3517	3485	3950	4250	4100	3701	3884	3793
S ₅ (NK + 100% P + PSB)	3807	3965	3886	4130	4400	4265	3969	4183	4076
S ₆ (NK + 125% P + PSB)	4000	4252	4126	4330	4690	4510	4165	4471	4318
S ₇ (NK + 150% P + PSB)	4106	4297	4202	4790	4980	4885	4448	4639	4544
Mean	3534	3694	3614	3920	4153	4036	3727	3924	3825

Experiment No. 3: Evaluation of herbicides for weed control in maize (Item No. 2018/K/162, 2019/K/141)**Table 13: Evaluation of herbicides for weed control in maize (Vivek Maize Hybrid 53) (Kharif 2018)**

S. N.	Treatment	Grain yield (q/ha)
T ₁	Weedy check	91
T ₂	Weed free	121
T ₃	Atrazine as PrE (1.5 kg a.i./ha) + 2,4-D Amine 0.4 kg a.i./ha at 25 DAS as PoE	113
T ₄	Atrazine @ 1.5 kg/ha PrE + Tembotrione 120 g a.i./ha PoE at 25 DAS	115
T ₅	Atrazine @ 1.5 kg/ha PrE + Tembotrione 120 g a.i./ha PoE at 25 DAS + One earthing	118
T ₆	Tembotrione 120 g a.i./ha PoE at 25 DAS	114
T ₇	Tembotrione 120 g a.i./ha PoE at 25 DAS + One earthing	117
T ₈	Tembotrione 120 g a.i./ha PoE at 25 DAS + Two earthings at knee high and tasseling	119
	CD	17

Table 14: Effect of different herbicides on weed competition index in maize (Kharif 2019)

S.N.	Treatment	Weed competition index
T ₂	Weedy check	49
T ₃	Atrazine + 2,4-D Amine	16
T ₄	Atrazine + Tembotrione	8
T ₅	Atrazine + Tembotrione + 1 Earthing	6
T ₆	Tembotrione	11
T ₇	Tembotrione + 1 Earthing	7
T ₈	Tembotrione + 2 Earthings	3

Experiment No. 4: Response of increasing nitrogen levels to finger millet varieties under rainfed condition (Item No. 2018/K/165, 2019/K/144)**Table 15: Effect of nitrogen levels on grain yield of finger varieties**

Treatment	Grain yield (q/ha)		
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	Kharif 2018	Kharif 2019	Mean
Variety			
VL Mandua 352	22.27	24.12	23.20
VL Mandua 379	26.73	28.14	27.44
C.D. (0.05)	1.58	1.26	
Nitrogen levels			
N ₀ : No N	19.62	20.28	19.95
N ₁ : 50 % RDN	20.88	25.71	23.30
N ₂ : 100 % RDN	23.65	27.80	25.73
N ₃ : 150 % RDN	26.63	28.55	27.59
N ₄ : 200 % RDN	31.69	28.30	30.00
C.D. (0.05)	2.50	1.99	-

Experiment No. 5: Response of increasing nitrogen levels to grain amaranth varieties (for SVT)
(Item No. 2018/K/166)

Table 16: Effect of nitrogen levels on grain yield of amaranth varieties

Treatment	Grain yield (q/ha)
Variety	
V ₁ : VL 110	10.39
V ₂ : VL 101	9.56
V ₃ : VL Chua 44	10.36
C.D. (0.05)	NS
C.D. (0.05)	1.58
Nitrogen levels	
N ₀ : 0 Kg N	6.40
N ₁ : 30 Kg N	8.78
N ₂ : 60 Kg N	12.06
N ₃ : 90 Kg N	13.17
C.D. (0.05)	0.93

Experiment No. 6 Management of heat stress during grain filling stage of wheat through MOP spray (Item No. 2018/R/96)

Table 17: Wheat yield of different varieties under different dates of sowings and MOP spray (Rabi 2018-19)

Date of Sowing	Variety	Heat Stress Management	Grain yield (q/ha)
09-11-2018 (D ₁)	VL 953	MOP Spray	59.3
		Control	52.7
	VL 892	MOP Spray	49.5
		Control	47.8
15-12-2018 (D ₂)	VL 953	MOP Spray	52.4
		Control	51.3
	VL 892	MOP Spray	41.7
		Control	40.1
Date of Sowing			
09-11-2018 (D ₁)			52.3
15-12-2018 (D ₂)			46.4
CD			5.8
Variety			

VL 953			53.9
VL 892			44.8
CD			8.6
Heat Stress Management			
MOP Spray			50.7
Control			48.0
CD			NS

Experiment No. 7: Comparative performances heat stress damage ameliorating substances in wheat (Item No. 2018/R/97)

Table 18 : Effect of heat stress damage ameliorating substances on wheat yield (Rabi 2018-19)

Heat Stress Management	Grain yield (q/ha)
MOP (0.2%)	39.2
KNO ₃ (2%)	39.8
Salicylic acid (75 ppm)	39.4
Control	40.5
CD	NS

Experiment No. 8: Effect of Kharif season crops sown under different sowing methods on the productivity, profitability and sustainability of rainfed rabi crops (Item No. 2020/K/145)

Table 19: Fingermillet Equivalent Yield (FMEY) of Kharif season crops sown different sowing methods (Kharif 2020)

Treatment	Fingermillet Equivalent Grain Yield (FMEY) (kg/ha)	Fingermillet Equivalent Straw Yield (FMEY) (kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Kharif Crop						
Fingermillet	3035	4503	57960	121380	63420	2.11
Soybean	3052	3543	53219	117402	64183	2.22
Rice	881	1811	43230	37634	-5596	0.88
Mean	2323	3286	51470	92139	40669	1.74
CD (P=0.05)	136	202	-	5387	5387	0.10
Sowing Method						
Broadcasting	2198	3166	50725	87476	36751	1.67
Line sowing	2314	3303	46823	91944	45121	1.89
Line Sowing/ Transplanting + Mulch	2455	3388	56861	96996	40135	1.65
Mean	2323	3286	51470	92139	40669	1.74
CD (P=0.05)	136	NS	-	5387	5387	0.10
Rabi Crop						
Wheat	2305	3270	51426	91472	40046	1.73
Lentil	2341	3301	51513	92806	41292	1.75
Mean	2323	3286	51470	92139	40669	1.74
CD (P=0.05)	NS	NS	-	NS	NS	NS

Table 20 : Fingermillet Equivalent Yield (FMEY) of Kharif season crops sown different sowing methods under different treatment combinations (Kharif 2020)

Treatment	Grain Yield (kg/ha)	Straw yield (kg/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
Fingermillet + Broadcasting-Wheat	2810	4270	62722	62722	50149	1.80
Fingermillet + Broadcasting-Lentil	2878	4327	62888	62888	52497	1.83
Fingermillet + Line sowing -Wheat	3010	4500	51297	51297	69257	2.35
Fingermillet + Line sowing -Lentil	3076	4587	51458	51458	71676	2.39
Fingermillet + Line sowing/ Transplanting + Mulch -Wheat	3255	4729	59789	59789	69916	2.17
Fingermillet + Line sowing/ Transplanting + Mulch -Lentil	3179	4604	59605	59605	67025	2.12
Soybean + Broadcasting-Wheat	2445	4307	48562	48562	62454	2.29
Soybean + Broadcasting-Lentil	2497	4373	48711	48711	64559	2.32
Soybean + Line sowing -Wheat	2560	4486	49948	49948	66217	2.33
Soybean + Line sowing -Lentil	2575	4489	49990	49990	66753	2.34
Soybean + Line sowing/ Transplanting + Mulch -Wheat	2664	4513	60839	60839	59447	1.98
Soybean + Line sowing/ Transplanting + Mulch -Lentil	2811	4761	61263	61263	65672	2.07
Rice + Broadcasting-Wheat	1494	2834	40748	40748	-4332	0.89
Rice + Broadcasting-Lentil	1475	2784	40720	40720	-4822	0.88
Rice + Line sowing -Wheat	1519	2838	39084	39084	-2200	0.95
Rice + Line sowing -Lentil	1574	2930	39160	39160	-974	0.98
Rice + Line sowing/ Transplanting + Mulch -Wheat	1637	2921	49841	49841	-10493	0.79
Rice + Line sowing/ Transplanting + Mulch -Lentil	1626	2897	49826	49826	-10754	0.79
Mean	2394	3953	51470	51470	40669	1.74

Experiment No. 9: Response of soybean varieties to different phosphorus levels (Item No. 2020/K/146)

Table 21: Seed yield of soybean varieties under different phosphorus levels (Karif 2020)

Treatment	Seed yield (q/ha)
Variety	
VL Soya 47	20.9
VL Soya 89	21.5
CD (=0.05)	NS
P level (kg P₂O₅/ha)	
0 (Control)	18.2
55	20.8
80	22.5
105	23.3
CD (=0.05)	1.0

Experiment No. 10: Evaluation of buckwheat in different dates for its suitability for contingency planning (Item No. 2020/K/149)

Table 22: Effect different sowing dates on yield of buckwheat (Kharif 2020)

Date of sowing	Yield (kg/ha)	Date of sowing	Yield (kg/ha)	Date of sowing	Yield (kg/ha)	Date of sowing	Yield (kg/ha)
Mar 10	499.8	Apr 30	327.8	Jun 20	472.2	Aug 10	434.8
Mar 20	399	May 10	370.2	Jun 30	520.4	Aug 20	412.2
Mar 30	407.4	May 20	352.6	Jul 10	293	Aug 30	308.2
Apr 10	294.8	May 30	339.2	Jul 20	492.8	Sept 10	285.6
Apr 20	247	Jun 10	484.4	Jul 30	740.8	Sept 20	284.4
<i>LSD (0.05) = 138.4</i>							

Experiment No. 11: Effect of split application of varying nitrogen levels in finger millet-wheat cropping system under rainfed conditions (Item No. 2020/K/150)

Table 23: Effect of split application of varying nitrogen levels on finger millet yield under rainfed finger millet-wheat cropping system (Kharif 2020)

Treatments	Yield (kg/ ha)
<i>N levels</i>	
N ₁ : 50 % RDN	1752
N ₂ : 100 % RDN	2028
N ₃ : 150 % RDN	2307
N ₄ : 200 % RDN	2350
<i>LSD (=0.05)</i>	181
<i>Splitting</i>	
S ₁ : ½ at basal + ½ at 35-40 DAS	1998
S ₂ : 1/3 at basal + 1/3 at 30 DAS+1/3 at 60 DAS	2106
S ₃ : 1/4 at basal + 3/8 at 30 DAS + + 3/8 at 60 DAS	2224
<i>LSD (=0.05)</i>	157

Table 24: Interaction effect of split application of varying nitrogen levels on finger millet yield under rainfed finger millet-wheat cropping system (Kharif 2020)

<i>Splitting</i>	<i>N levels</i>			
	N ₁ : 50 % RDN	N ₂ : 100 % RDN	N ₃ : 150 % RDN	N ₄ : 200 % RDN
S ₁ : ½ at basal + ½ at 35-40 DAS	1689	1969	2080	2254
S ₂ : 1/3 at basal + 1/3 at 30 DAS+1/3 at 60 DAS	1919	2149	2324	2032
S ₃ : 1/4 at basal + 3/8 at 30 DAS + + 3/8 at 60 DAS	1648	1966	2516	2765
<i>LSD (=0.05)</i>	313			

Experiment No. 12: Evaluation of various planting methods for irrigated rice (Item No. 2020/K/151)

Table 25: Effect of different planting methods on grain yield of rice (Kharif 2020)

Treatments	Yield (kg/ ha)
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<i>Planting methods</i>	
M1: Line Sowing	6334
M2: SRI	6770
M3: Transplanting	7095
M4: Farmers Practice	6993
<i>LSD (=0.05)</i>	NS
<i>Varieties</i>	
V1: VL Dhan 65	6847
V2: VL Dhan 86	6744
<i>LSD (=0.05)</i>	NS

Experiment No. 13: Response of finger millet varieties to different dates of sowing under rainfed conditions to screen suitable variety for contingent crop planning (Item No. 2020/K/152)

Table 26: Effect of different dates of sowing on yield of fingermillet varieties (Kharif 2020)

Treatments	Yield (kg/ ha)
<i>Date of sowing</i>	
D ₁ : 25 th June	3288
D ₂ : 5 th July	2983
D ₃ : 15 th July	2587
D ₄ : 25 th July	631
<i>LSD (=0.05)</i>	172
<i>Varieties</i>	
V ₁ : VL 347	2209
V ₂ : VL 352	2577
V ₃ : VL 376	2386
V ₄ : VL 378	2721
V ₅ : VL 379	2153
V ₆ : VL 380	2187
<i>LSD (=0.05)</i>	211

Table 27: Interaction effect of different dates of sowing on yield of fingermillet varieties (Kharif 2020)

<i>Dates of Sowing</i>	<i>Varieties</i>					
	V ₁ : VL 347	V ₂ : VL 352	V ₃ : VL 376	V ₄ : VL 378	V ₅ : VL 379	V ₆ : VL 380
D ₁ : 25 th June	2303	3485	3668	3297	3706	3266
D ₂ : 5 th July	2731	3450	3189	4102	2044	2385
D ₃ : 15 th July	2682	2902	2212	2550	2525	2652
D ₄ : 25 th July	1120	472	474	935	337	448
<i>LSD (=0.05)</i>	421					

Experiment No. 14: Response of Different nutrient sources in seed yield of Buckwheat (Item No. 2020/K/153)

Table 28: Effect of different nutrient sources in seed yield of buckwheat (Kharif 2020)

Treatments	Yield (kg/ha)
T ₁ : N:P:K (30:20:10) through Urea + SSP + MoP	1400

T ₂ : N:P:K (30:20:10) through Calcium Nitrate + SSP + MoP	1366
T ₃ : N:P:K (30:20:10) through Urea + DAP + MoP	1072
T ₄ : N:P:K (30:20:10) through Calcium Nitrate + DAP + MoP	1025
T ₅ : N:P:K (30:20:10) through Urea + NPK	1176
T ₆ : N:P:K (30:20:10) through Calcium Nitrate + NPK	1281
T ₇ : 20 kg P/ha through FYM	1251
T ₈ : 10 kg P/ha through FYM	1215
LSD (=0.05)	232

Sub Project B. Identification of micro watershed (natural spring) using Remote sensing & GIS technique and its runoff estimation for potential water harvesting (Er. Utkarsh Kumar-PI)

Experiment No. 1: To identify the micro watershed (natural spring) using watershed delineation technique (*Item No. 2019/K/145, 2019/R/103, 2020/K/154*)

Table 29: Location of trenches in the springshed catchment

Trench No.	Latitude	Longitude	Elevation (m)
1	29.63219	79.6321667	1191
2	29.63211	79.6319167	1191
3	29.63208	79.6318333	1193
4	29.63214	79.6321667	1184
5	29.63214	79.6320556	1182
6	29.63206	79.6320278	1183
7	29.63103	79.6313056	1180
8	29.63106	79.63125	1179
9	29.63111	79.6311944	1179
10	29.63111	79.6310556	1180
11	29.63111	79.6310278	1180
12	29.63078	79.6318056	1174
13	29.63064	79.6316667	1173
14	29.63053	79.6316667	1173
15	29.63042	79.6314444	1174