

NATIONAL FOOD SECURITY MISSION-OILSEEDS

Success of Cluster Front Line Demonstrations at Partner Farmers Fields

राष्ट्रीय खाद्य सुरक्षा मिशन-तिलहन
साथी किसानों के प्रक्षेत्रों पर समूह अग्रिम पंक्ति प्रदर्शनों की सफलताएं
(2016 to 2019)



सत्यमेव जयते

Department of Agriculture, Cooperation and Farmers Welfare
Ministry of Agriculture and Farmers Welfare
Government of India, New Delhi

कृषि, सहकारिता एवं किसान कल्याण विभाग
कृषि एवं किसान कल्याण मंत्रालय
भारत सरकार, नई दिल्ली



कृषि विज्ञान केंद्र, वित्तोड़गढ़
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Message

Oilseeds cultivation covers an area of about 26.00 million hectares. Of nine major oilseeds, Soybean (39%), Groundnut (26%) and Rapeseed-Mustard (24%) contribute over 88% of the country's total production of oilseeds. The country has attained self-sufficiency in production of most of the commodities, however, there is a huge gap in terms of oilseeds production as compared to annual requirements. The import of edible oils is being made to the tune of more than seventy thousand crore annually.

In the states of Rajasthan, Haryana and Delhi, a total of 43 KVKs are engaged in conductance of cluster front line demonstrations under the National Food Security Mission to showcase the production potential of oilseeds for harnessing the productivity and production. Results of demonstrations at farmers' fields are quite encouraging. During 2015-2019, average productivity of groundnut was recorded as 23.53q/ha, mustard as 17.81q/ha and soyabean and sesame expressed yield levels of 14.65q and 5.48q/ha, respectively. The results of demonstrations indicate a significant gap in yield levels realized by adopting recommended practices as against farmers' practices.

I appreciate the efforts of Director ATARI, Jodhpur and the scientists; and team of specialists at KVKs. The support of NFSM is appreciable for promotion of oilseeds programme.

I hope this publication will be useful for the scientists, policy makers, extension workers, students and farmers.

Dated: 21.09.2020

(A.K. Singh)

Deputy Director General (AE)

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Preface

The major objectives of NFSM-oilseeds are in order to increase production and productivity of oilseeds crops; to pilot innovations and improved efficiency within overall objective of scheme and its expected outcomes and to undertake mitigation/restoration activities in case of natural calamities in oilseeds sector. Major oilseed crops whose technologies demonstrated at farmers' fields are groundnut, soybean, sesame and mustard. Since October, 2015 to 2018-19, 20768 CFLDs have been laid out in 8708 ha area by ICAR-Agricultural Technology Application Research Institute Zone-II, Jodhpur through an active involvement of KVKs.

Total 62 KVKs including 43 KVKs from Rajasthan 18 KVKs from Haryana and one KVK from Delhi are actively involved in conductance of CFLDs in Kharif and Rabi season. In Rajasthan, an average yield of CFLDs on groundnut, soybean, sesame and mustard was recorded 24.76, 12.21, 4.82 and 19.30 q/ha, respectively, during 208-19. Yield of CFLDs minimized the yield gap of 4.17q in groundnut, 2.45q in soybean, 1.21q in sesame and 4.04 q/ha in mustard.

I compliment scientists of ICAR-Agricultural Technology Application Research Institute, Zone-II, Jodhpur for implementing, monitoring & coordinating this scheme with different stakeholders involved in the oilseeds production.

I am also thankful to Directors of Extension Education from various State Agriculture Universities and Senior Scientist & Head, Subject Matter Specialists of KVKs for implementing NFSM-Oilseeds in right spirit for enhancing oilseed production in Rajasthan, Haryana and Delhi states. I am sure that much effort will be done in future by KVKs of this zone to achieve self-sufficiency in oilseeds production in the country.

I hope this publication will be useful for policy planners, scientists, extension workers, students and farmers.


(S.K. Singh)

Abbreviation

1.	ATARI	Agricultural Technology Application Research Institute
2.	BCR	Benefit Cost Ratio
3.	CFLDs	Cluster Front Line Demonstrations
4.	DAC&FW	Department of Agriculture, Cooperation & Farmers Welfare
5.	DAS	Days After Sowing
6.	FYM	Farm Yard Manure
7.	GOI	Government of India
8.	Ha	Hectare
9.	ICAR	Indian Council of Agricultural Research
10.	IDM	Integrated Disease Management
11.	INM	Integrated Nutrient Management
12.	IPM	Integrated Pest Management
13.	IWM	Integrated Weed Management
14.	KVKs	Krishi Vigyan Kendras
15.	MIS	Micro Irrigation System
16.	NFSM	National Food Security Mission
17.	PSB	Phosphorus Solubilizing Bacteria
18.	Q.	Quintals
19.	Rs.	Rupees
20.	SMSs	Subject Matter Specialists

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6	Bikaner-I	Rajasthan	Groundnut	Kharif	23
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Year 2016-19					
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9	Jaipur-I	Rajasthan	Sesame	Kharif	32
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11	Mahendergarh	Haryana	Sesame	Kharif	39
12	Bharatpur	Rajasthan	Sesame	Kharif	42
13	Rewari	Haryana	Sesame	Kharif	46
14	Jaipur-I	Rajasthan	Sesame	Kharif	50
15	Mahendergarh	Haryana	Sesame	Kharif	54

S. No.	KVKs	State(s)	Crop(s)	Season(s)	
Year 2016-19					
16	Jhalawar	Rajasthan	Soybean	Kharif	57
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Executive Summary

1. Groundnut (*Arachis hypogea*)

Groundnut is a major oilseed crop of India. It is also an important agricultural export commodity. According to Directorate of Economics & Statistics, DAC&FW, New Delhi average area of groundnut from 2012-13 to 2016-17 was 4.99 million ha and production was 7.20 million tonnes with productivity of 14.44 q/ha. In India, during 2017-18 total area was 4.91 million ha and production was 9.18 million tonnes with productivity of 18.68 q/ha. During 2017-18, share of five major groundnut producing states, i.e Gujarat, Rajasthan, Andhra Pradesh, Tamil Nadu and Karnataka were 42.88%, 13.72%, 11.34%, 10.61% and 6.09%, respectively. While highest yield was recorded in Tamil Nadu (29.14q/ha) followed by Gujarat (23.43q/ha), Rajasthan (19.66q/ha), Andhra Pradesh (14.16q/ha) and Karnataka (9.08 q/ha) state. KVKs of Zone-II conducted total 2746 Cluster Front Line Demonstrations on Groundnut in 1100.00 ha area from Kharif-2016 to Kharif-2019 under Government of India sponsored scheme National Food Security Mission. The average productivity of groundnut was recorded 23.53 q/ha from Kharif-2016 to Kharif-2019. Full technology packages were demonstrated at farmers' fields. The state wise success stories on Groundnut CFLDs have been presented herein.



2. Rapeseed & Mustard (*Brassica campestris* and *Brassica Juncea*)

Rapeseed-Mustard is the main oilseed crop for the Rabi season in India. It is grown in more than 80% area covered under oilseeds crops during rabi season. According to Directorate of Economics & Statistics, DAC&FW, New Delhi, average area of Rapeseed & Mustard from 2012-13 to 2016-17 was 6.13 Million ha, produced 7.38 million tonnes with productivity of 12.03 q/ha. In India, during 2017-18 total area was 5.96 million ha produced 8.32 million tonnes with the productivity of 13.97 q/ha. During 2017-18 Rajasthan, Haryana, Madhya Pradesh, Uttar Pradesh, and West Bengal were the highest grown states i.e. more than 70% of total mustard acreage in the country and the share in total production of India were 40.87%, 13.31%, 11.73%, 11.36% and 8.68% respectively. The secondary data indicated that highest yield was recorded in Haryana (20.18q/ha) followed by Gujarat (18.10q/ha), Rajasthan (15.47q/ha), Punjab (14.79q/ha) and Uttar Pradesh (13.92q/ha).

ICAR-ATARI, Zone-II conducted total 10746 CFLDs on Rapeseed-Mustard in 4557.85 ha area from Rabi-2015-16 to Rabi-2018-19 under NFSM. The average productivity of Rapeseed-Mustard was recorded 17.81 q/ha from Rabi-2015-16 to Rabi-2018-19. Full technology packages were demonstrated at farmers' fields. The state wise success stories on Rapeseed-Mustard CFLDs have been presented.



3. Soybean (*Glycine max*)

Soybean has become an important oilseed crop in India. Approximately 10-million ha area are under its cultivation. There has been an unprecedented growth in soybean; area which was just 0.03 m ha in 1970 and has reached to 10.47 million ha in 2017-18. According to Directorate of Economics & Statistics, DAC&FW, New Delhi average area of Soybean from 2012-13 to 2016-17 was 11.25 million produced 11.73 million tonnes with productivity of 10.42 q/ha. During 2017-18 total area was 10.47 million ha and production of 10.98 million tonnes with productivity of 10.49 q/ha. The major soybean growing states are Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Andhra Pradesh, and Chhattisgarh. These states together contribute to about 98 % of the total soybean production in the country. Soybean contributes 40 and 25 % to the total oilseeds and edible oil production of the country. As per secondary data during 2017-18 highest yield was recorded in Telangana (16.25q/ha) followed by Rajasthan (12.07q/ha), Madhya Pradesh (10.62q/ha), Maharashtra (10.12q/ha) and Karnataka (8.30q/ha).

KVKs of Zone-II conducted total 2117 CFLDs on Soybean in 817.60 ha area from Kharif-2016 to Kharif-2019 under NFSM. The average productivity of Soybean was recorded 14.65 q/ha from Kharif-2016 to Kharif-2019. Full technology packages were demonstrated at farmers' fields. The state wise success stories on Soybean CFLDs have been presented.



4. Sesame (*Sesamum indicum*)

India is expected to have a bumper crop of sesame seeds of approximately 3.97 lakh tons during kharif 2019 as compared to 1.77 lakh tons during kharif 2018. Yield of sesame has also more than doubled, increasing from 134 kg/ha to 298 kg/ha in India. The area under cultivation has reached a marginal growth, increasing from 13.24 lakh ha to 13.71 lakh ha (Agri watch, 24th October 2019). It is widely preferred for its qualities of high drought tolerance and the highest oil content in the seeds. Sesame seeds contain the highest oil compared to any other oilseed to an extent of 50% and above. The unique qualities of sesame oil are stability and resistance to rancidity, with long shelf life due to the presence of the high level of natural antioxidants.

KVKs of Zone-II conducted total 3034 CFLDs on Sesame in 1271.20 ha area from Kharif-2016 to Kharif-2019 under NFSM. The average productivity of Sesame was recorded 5.48 q/ha from Kharif-2016 to Kharif-2019. Full technology packages were demonstrated at farmers' fields. The state wise success stories on Sesame CFLDs have been presented.



1

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1. Technology demonstrated

Variety: GG 20

Seed rate: 60-80 kg/ha

Nutrient management

- Application of 7-7.5 tons of FYM with Azotobactor & Phosphorus soluble bacteria 5 kg/ha.
- Application of 20 kg/ha N, 75 kg/ha P₂O₅ and 20 kg/ha Sulphur.
- Soil application of 25 kg ZnSO₄ and foliar spray of 0.5% ZnSO₄ at 45 and 60 DAS.

Weed management

- Spraying of pre emergence herbicide Pendimethalin 30% EC 3.30 liter/ha (1.0 liter a.i.).
- Spraying of post emergence herbicide Imazethapyr 10% SL @ 750 ml/ha.

Disease management

- Seed treatment with Thiram/Mancozeb (3g/kg seed) or Carbendazim (2g/kg seed) or Tebuconazole (Raxil 2% DS) @ 1.25g/kg or Trichoderma viride 10 gm/kg seed.
- *Root and Collar Rot:* Above mention seed treatment and soil application of Trichoderma viride 2.5 kg + 100 kg cow dung per ha.
- *Tikka disease:* Spray of Mancozeb 75% WP 1-1.5 kg/ha.
- *Iron deficiency or Piliya Disease:* Foliar spray of 1% FeSO₄ at 30, 40 and 50 DAS.

Insect management

- *Termites:* Seed treatment with Chlorpyrifos 20% EC 4-5 ml or Imidacloprid 70% WS 5 gm/kg seed and Chloropyrifos 20% EC 4 liter/ha with irrigation.
- *White grubs:* Soil application of Quinolphos 5% g or Carbofuron 3% G 25 kg/ha and Chloropyrifos 20% EC 4 liter/ha with irrigation.
- *Aphids:* Spraying of Malathion 50% EC 1 litre/ha or Methyl Demeton 25% EC 1 litre/ha.

2. Performance of technology

- Average yield of groundnut in CFLDs was 27.50 q/ha, whereas in farmer's practices the yield was observed 22.50 q/ha.
- Average yield of groundnut CFLDs was 22.22% higher than that of farmer's practices.
- Net income under CFLDs was Rs. 58517.00, while under farmer's practices, net income was observed Rs. 42268.00.
- Farmers got Rs. 16249.00 per hectare as an additional income through CFLDs.
- B:C ratio of CFLDs were recorded 1.68 as compared to farmer's practices (1.53).

Table 1 Performance of groundnut production technology in Sabarkantha during Kharif 2016

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	22.50	79018	121286	42268	1.53
CFLDs	27.50	85475	143992	58517	1.68
% Increase	22.22	-	-	38.44	-



Critical input management for partner farmers



Field day organized at farmer's field

3. Yield

- Average yield of CFLDs was observed as 27.50 q/ha, which was 14.32 q/ha higher than district yield (13.18 q/ha), 9.55 q/ha higher than state yield (17.95 q/ha) and 13.52 q/ha higher than national yield (13.98 q/ha).
- Average yield of CFLDs were 7.50 q/ha higher, as compared to potential yield (20.00 q/ha).

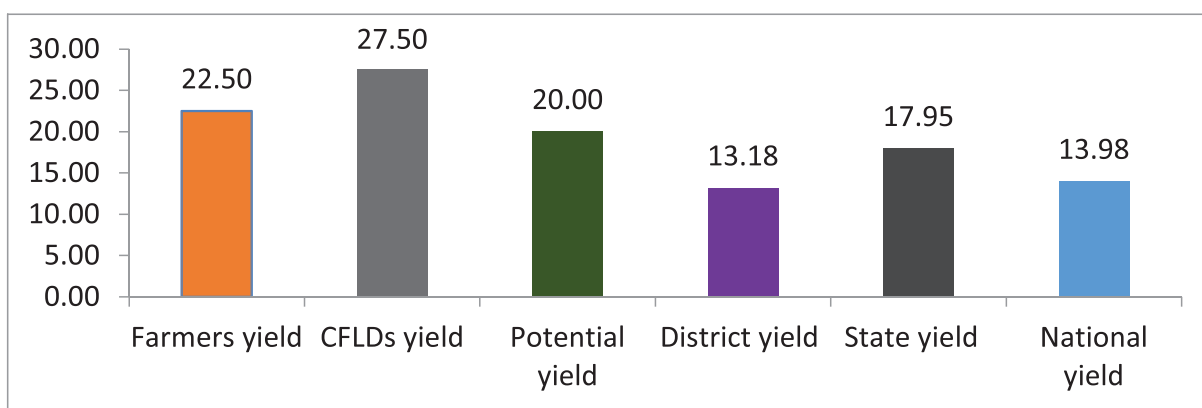


Fig. 1 Comparative average yield (q/ha) of groundnut in Sabarkantha district, Gujarat

4. Institutional involvement

- ICAR-ATARI, Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical sessions and field visits.
- Nodal officers of KVKs imparted training to farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy were given and extension activities were conducted.

5. Success point

- Improved variety of groundnut gave maximum yield.
- Timely sowing and recommended crop geometry managed the yield of groundnut.
- Balanced and need based use of fertilizers helped in increasing the yield.
- Weeds management through pre emergence herbicide Pendimethalin and post emergence herbicide Imazethapyr minimized the weeds population.
- Seed treatment and timely used of fungicides and insecticides helped in disease and insect management.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- By application of large seeded variety GG 20, saving of 25% seed due to sowing in recommended spacing
- Due to Micro Irrigation System (MIS), 30 % water saved.
- Saving of 10 kg N & 8 kg P₂O₅ through adoption of bio-fertilizers.
- Low incidence of stem rot and yield increased by 22.22 %.
- Area under kharif groundnut will be increased in coming year due to low cost of cultivation.
- Good germination due to seed treatment, good weed control by herbicide, resulted in labour saving, better growth and development of plant and higher yield.

KRISHI VIGYAN KENDRA, BIKANER-I (RAJASTHAN)

Sh. Lal Chand S/o Sh. Govardhan Nath

Address: Village: Benisar, PS: Bikaner
District: Bikaner (Rajasthan)



1. Technology demonstrated

Variety: HNG 69

Seed rate: 60-80 kg seed/ha for spreading and semi-spreading varieties.

Nutrient management

- 7-7.5 tons of FYM with Azotobactor & Phosphorus soluble bacteria 5 kg/ha.
- 20 kg/ha N, 75 kg/ha P₂O₅ and 20 kg/ha Sulphur.
- Soil application of 25 kg ZnSO₄ and foliar spray of 0.5% ZnSO₄ at 45 and 60 DAS.

Weed management

- Spraying of pre emergence herbicide Pendimethalin 30% EC 3.30 liter/ha (1.0 liter a.i.).
- Spraying of post emergence herbicide Imazethapyr 10% SL @ 750 ml/ha.

Disease management

- Seed treatment with Thiram/Mancozeb (3g/kg seed) or Carbendazim (2g/kg seed) or Tebuconazole (Raxil 2% DS) @ 1.25g/kg or Trichoderma viride 10 gm/kg seed.
- *Root and Collar Rot:* Above mention seed treatment and soil application of Trichoderma viride 2.5 kg + 100 kg cow dung per ha.
- *Tikka disease:* Spray of Mancozeb 75% WP 1-1.5 kg/ha.
- *Iron deficiency or Piliya Disease:* Foliar spray of 1% FeSO₄ at 30, 40 and 50 DAS.

Insect management

- *Termites:* Seed treatment with Chlorpyriphos 20% EC 4-5 ml or Imidachloprid 70% WS 5 gm/kg seed and Chloropyriphos 20% EC 4 liter/ha with irrigation.
- *White grubs:* Soil application of Quinolphos 5% g or Carbofuron 3% G 25 kg/ha and Chloropyriphos 20% EC 4 liter/ha with irrigation.

2. Performance of technology

- Average yield of groundnut was obtained as 36.70 q/ha, whereas in farmers' practices the yield was 31.40 q/ha.
- Average yield of groundnut under CFLDs was 16.88% higher than that of farmers' practices.
- Net income of CFLDs was Rs. 72005.00 compared to farmers' practices (Rs. 64470.00). Thus, farmers got an additional income of Rs. 7535.00 per hectare through CFLDs.
- B:C ratio of CFLDs were recorded as 3.70 compared to farmers' practices (3.00).

Table 2 Performance of groundnut production technology in Bikaner during Kharif 2016

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	31.4	32870.00	97340.00	64470.00	3.00
CFLDs	36.7	27500.00	90240.00	72005.00	3.70
% Increase	16.88	-	-	11.69	-



Field day organized at farmer's field

3. Yield

- The average yield in CFLDs was 36.70 q/ha, which was 3.54 q/ha higher than average district yield (33.16 q/ha), 16.57 q/ha higher than state average yield (20.13 q/ha) and 22.72 q/ha higher than national average yield (13.98 q/ha).
- The average yield of CFLDs was 3.30 lower as compared to potential yield (40.00 q/ha).

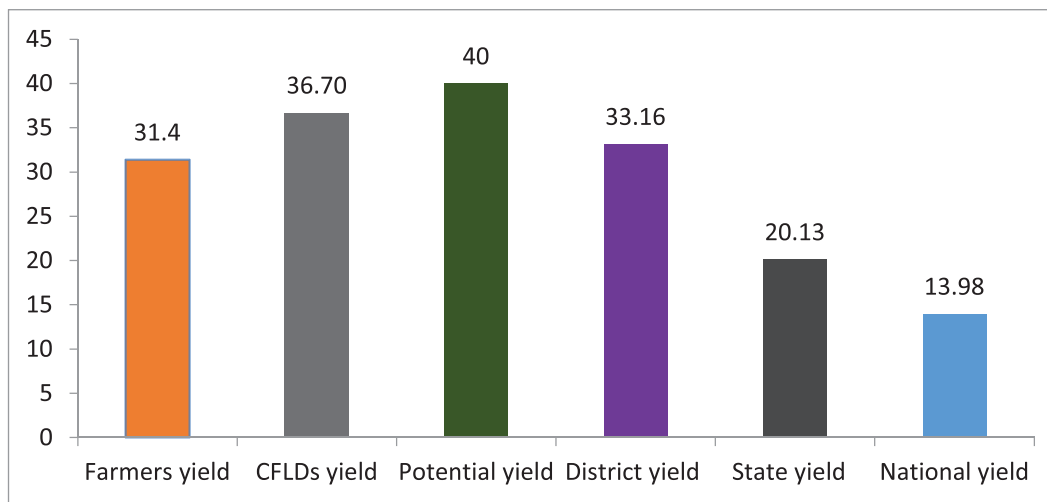


Fig. 2 Comparative average yield (q/ha) of groundnut in Bikaner district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized workshop cum training programs for nodal officers of all KVKs and trained them by different methods including interactive lectures and field visits on related area.
- Nodal officers of KVKs imparted training for farmers before and during implementation of CFLDs, timely field visits made by Subject Matter Specialists, telephonic advisory/consultancy were given and extension activities were conducted.
- Local agricultural departments and progressive farmers were invited for sharing their field experiences.
- Regular following visits before sowing, after 20 days sowing, to assess crop stands at the time of insect pest management and maturity stage and also ascertain farmer reaction for application of accepted technologies and reason for rejection.

5. Success point

- Timely sowing and recommended crop geometry managed the yield of groundnut.
- Balanced and need based use of fertilizers helped in increasing the yield.

- Weeds management through pre emergence herbicide Pendimethalin and post emergence herbicide Imyzathyper minimized the weeds population.
- Seed treatment and timely use of fungicides and insecticides helped in disease and insect management.
- With availability of demand driven seeds of suitable variety of groundnut.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmers showed interest to follow the all components of crop improvement like; crop geometry, optimum seed rate, timely sowing, seed treatment, Integrated Nutrient Management (INM), Integrated Weed Management (IWM), Integrated Disease Management (IDM) and Integrated Pest Management (IPM).
- Farmers' prefer high yielding groundnut variety i.e., HNG-69. Farmers also promote this variety to other farmers.
- He has kept 15.00 quintal produce as seed and distributed to farmers of nearby villages have already ensured to purchase seed of HNG-69 variety of groundnut from him for coming season, Kharif 2017.

3

KRISHI VIGYAN KENDRA, BIKANER-I (RAJASTHAN)

Sh. Govardhan Ram S/o Sh. Dhura Ram

Address: Village: Khara, PS: Bikaner
District: Bikaner (Rajasthan)



1. Technology demonstrated

Variety: HNG 69

Seed rate: 60-80 kg seed/ha for spreading and semi-spreading varieties.

Nutrient management

- Application 7-7.5 tons FYM with Azotobactor & Phosphorus soluble bacteria 5 kg/ha.
- Application of 20 kg/ha N, 75 kg/ha P₂O₅ and 20 kg/ha Sulphur.
- Soil application of 25 kg ZnSo₄ and foliar spray of 0.5% ZnSo₄ at 45 and 60 DAS.

Weed management

- Spraying of pre emergence herbicide Pendimethilin 30% EC 3.30 liter/ha (1.0 liter a.i.).
- Spraying of post emergence herbicide Imyzathyper 10% SL @ 750 ml/ha after 20-22 days of sowing.

Disease management

- Seed treatment with Thiram/Mancozeb (3g/kg seed) or Carbendazim (2g/kg seed) or Tebuconazole (Raxil 2% DS) @ 1.25g/kg or Trichoderma viride 10 gm/kg seed.
- *Root and Collar Rot:* Above mention seed treatment and soil application of Trichoderma viride 2.5 kg + 100 kg cow dung per ha.
- *Tikka disease:* Spraying of Mancozeb 75% WP 1-1.5 kg/ha.

Insect management

- *Termites:* Seed treatment with Chloropyriphos 20% EC 4-5 ml or Imidachloprid 70% WS 5 gm/kg seed and Chloropyriphos 20% EC 4 liter/ha with irrigation.
- *White grubs:* Soil application of Quinolphos 5% g or Carbofuron 3% G 25 kg/ha and Chloropyriphos 20% EC 4 liter/ha with irrigation.
- *Aphids:* Spraying of Malathion 50% EC 1 litre/ha or Methyl Demeton 25% EC 1 litre/ha.

2. Performance of technology

- CFLDs on groundnut were conducted during two consecutive years 2017-18 and 2018-19 at farmer's field of Bikaner district of Rajasthan.
- It was observed that average yield of groundnut in CFLDs was 38.10 q/ha, whereas in farmer's practices the yield was 23.79 q/ha.
- Average yield of groundnut under CFLDs was 60.15% higher than that of farmer's practices.
- Net income of farmer under CFLDs was Rs.72535.00 compared to his own practice (Rs. 43870).
- Thus, an additional income of Rs.28665.00 per hectare was added through CFLDs.
- B:C ratio under CFLDs was recorded as 3.29 and farmer's practices (2.60).

Table 3 Performance of groundnut production technology in Bikaner during Kharif 2017

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	23.79	27500	71370	43870	2.60
CFLDs	38.10	27500	90600	72535	3.29
% Increase	60.15	-	-	65.34	-



Field day organized at farmer's field

3. Yield

- Average yield of CFLDs was 38.10 q/ha, which was 13.79 q/ha higher than average district yield (24.31 q/ha), 17.81 q/ha higher than state average yield (20.29 q/ha) and 19.42 q/ha higher than national average yield (18.68 q/ha).
- It was noticed that average yield of CFLDs was 10.10q higher than potential yield (28.00 q/ha).

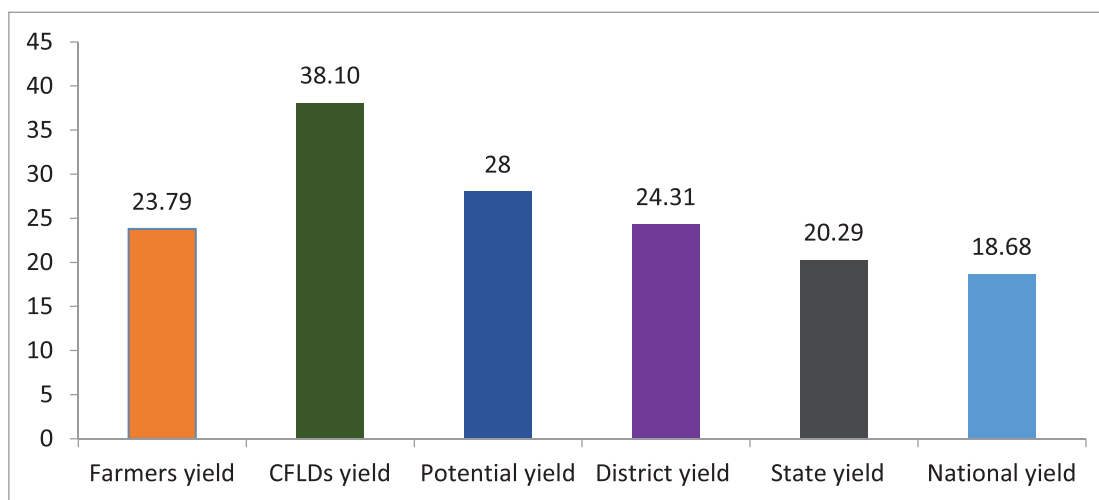


Fig. 3 Comparative average yield (q/ha) of groundnut in Bikaner district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized workshop-cum-training programs for nodal officers of all KVKs and trained them through technical sessions and field visits.
- Nodal officers of KVK imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.

5. Success point

- Improved and disease resistant variety of groundnut gave better yield.
- Timely sowing and recommended crop geometry enhanced the yield of groundnut.
- Balanced and need based use of fertilizers helped in increasing the yield.
- Weeds management through pre emergence herbicide Pendimethalin and post emergence herbicide Imazethapyr minimized the weeds population.
- Seed treatment and timely used of fungicides and insecticides helped in disease and insect management.

- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmers showed interest in follow up of major technology components like crop geometry, optimum seed rate, timely sowing, seed treatment, INM, IWM, IDM and IPM.
- Farmers rated improved groundnut variety HNG-69 as promising and promoting this variety to other fellow farmers of nearby villages.
- Mr. Govardhan Ram kept 18.00 quintal produce as seed and sold among farmers of village Nad.
- Nearby villagers have already ensured to purchase the seed of HNG-69 variety of groundnut from him for Kharif 2018.
- Farmers have assumed to use seeds of accepted variety HNG-69 and other technology package for proper management of weeds, diseases, insects and thereby better yield of groundnut.

KRISHI VIGYAN KENDRA, MAHENDERGARH (HARYANA)

Sh. Ajit S/o Sh. Jagmal

Address: VPO: Karira, District: Mahendergarh

Mobile: 9991244710



1. Technology demonstrated

Variety: Girraj-1041

Seed Rate: 80-100 kg/ha

Nutrient management

- Application of 15 kg N + 50 kg P₂O₅ + 25 kg K₂O + 25 kg ZnSO₄ + 40 kg S / ha

Diseases and insect-pests

- Collar rot and root rot occurrence at the early crop stage has been observed.
- Seed treatment with Chlorpyrifos (15 ml/g seed) and Captan (3g/kg seed) and termite and white grub attack at pod development stage were the main causes faced by the farmers. The problems were managed by application of recommended pesticides.

Weed management: One hoeing at 35-40 DAS.

2. Performance of technology

- CFLDs on groundnut were conducted at farmers' fields in 10.0 ha area during khraif-2017 & 2018.
- Groundnut variety Girraj-1041 gave an average yield of 21.3 q/ha which was 21.7% higher than local (17.5 q/ha).
- All demonstrations were organized in undulated topography under sandy soils and partial irrigated situations. Crop yield ranged from 15.0 to 30.0 q/ha. However, Mr. Ajit, successful farmer harvested 30.0 q/ha yield.

Table 4 Performance of groundnut production technology in Mahendergarh during Kharif 2017

Technology	Yield (q/ha)	% increase	Gross cost (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ ha)	B:C ratio
Farmer practice	17.5	-	38600	78750	40150	2.04
CFLDs	21.3	21.7	42590	95850	53260	2.25
Successful farmer	30.0	-	42590	135000	92410	3.17



Field day organized at farmer's field

4. Yield

- CFLDs on groundnut crop were conducted at farmers' fields in Mahendergarh district during kharif- 2017 & 2018.
- Results indicate that average yield of CFLDs was 21.3 q/ha which was 21.7 % higher than local (17.5 q/ha).
- Average yield of CFLDs (21.3 q/ha) was also higher than the average of the crop at state (10.0 q/ha) and district (16.5 q/ha). However, MrAjit, successful farmer harvested 30.0 q/ha yield.

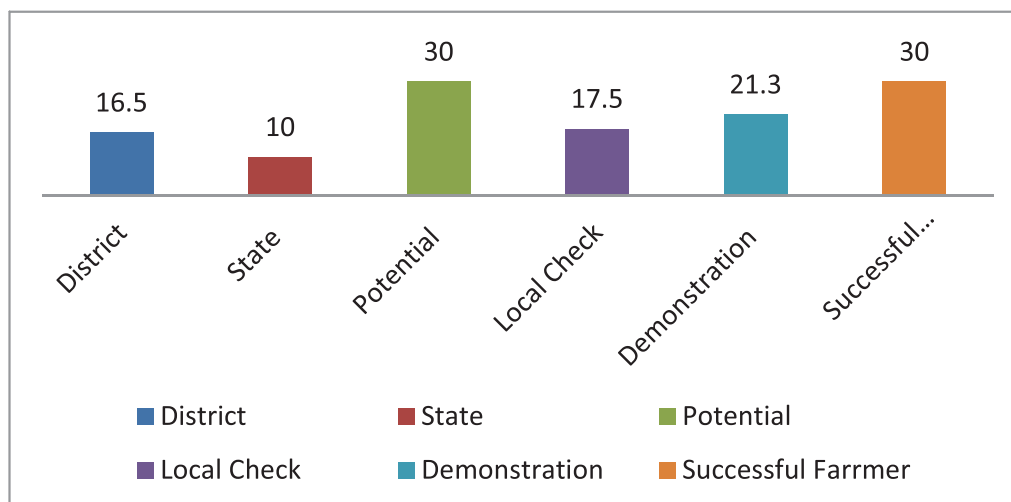


Fig. 4 Comparative average yield (q/ha) of groundnut in Mahendergarh district, Haryana

5. Institutional involvement

- CFLDs on groundnut were conducted by KVKs at farmer's field under NFSM project.
- Financial support for purchase of critical inputs for conducting CFLDs is provided by ICAR-ATARI, Zone-II, Jodhpur.
- Training cum group meeting for nodal officers of CFLDs on oilseeds was organized by ICAR-ATARI, Zone-II, Jodhpur.
- Effective implementation of CFLDs was done by concerned nodal officers.
- Monitoring of CFLDs was done regularly by team of KVK, to provide solutions of problems faced by the farmers.
- Field days were organized to show the impact of technologies demonstrated in field.

6. Success point

- Use of quality seed of improved variety Girraj-1041.
- Use of improved practices such as optimum seed rate, seed treatment, balanced application of fertilizers, timely weed management, insect-pest and disease management were the main factors responsible for higher yield of CFLDs as well as successful farmers.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

7. Farmers' feedback

- Quality seed of improved varieties needs to be made available at local level, seed treatment with Chloropyriphos and captan controlled termite and collar rot.
- Farmers accepted potentially of technology packages and it will be replicated in other villages in coming kharif season.

KRISHI VIGYAN KENDRA, BIKANER-I (RAJASTHAN)

Sh. Jagdish S/o Sh. Mangi Lal

Address: Village: Husangsar, Teh.: Bikaner
District: Bikaner (Rajasthan)



1. Technology demonstrated

Variety: HNG 69

Seed rate: 80-100 kg/ha for spreading and semi-spreading varieties.

Nutrient management

- Application of 7-7.5 tons of FYM with Azotobactor & Phosphorus soluble bacteria 5 kg/ha.
- Application of 20 kg/ha N, 75 kg/ha P₂O₅ and 20 kg/ha Sulphur.
- Soil application of 25 kg ZnSO₄ and foliar spray of 0.5% ZnSO₄ at 45 and 60 DAS.

Weed management

- Spraying of pre emergence herbicide Pendimethalin 30% EC 3.30 liter/ha (1.0 liter a.i.).
- Spraying of post emergence herbicide Imazethapyr 10% SL @ 750 ml/ha.

Disease management

- Seed treatment with Thiram/Mancozeb (3g/kg seed) or Carbendazim (2g/kg seed) or Tebuconazole (Raxil 2% DS) @ 1.25g/kg or Trichoderma viride 10 gm/kg seed.
- *Root and Collar Rot:* Above mention seed treatment and soil application of Trichoderma viride 2.5 kg + 100 kg cow dung per ha.
- *Tikka disease:* Spray of Mancozeb 75% WP 1-1.5 kg/ha.
- *Iron deficiency or Piliya Disease:* Foliar spray of 1% FeSO₄ at 30, 40 and 50 DAS.

Insect management

- *Termites:* Seed treatment with Chlorpyrifos 20% EC 4-5 ml or Imidacloprid 70% WS 5 gm/kg seed and Chlorpyrifos 20% EC 4 liter/ha with irrigation.
- *White grubs:* Soil application of Quinalphos 5% g or Carbofuran 3% G 25 kg/ha and Chlorpyrifos 20% EC 4 liter/ha with irrigation.

2. Performance of technology

- CFLDs were undertaken on groundnut during Kharif 2018 at farmer's field of Bikaner district of Rajasthan.
- Average yield of groundnut under CFLDs was 38.50 q/ha compared to farmer practices (33.80 q/ha).
- Average yield of groundnut under CFLDs was 13.90% higher than that of farmer's practices.
- Net income of CFLDs was Rs. 107300.00 than farmers practices (Rs. 83300.00).
- Thus, farmers got Rs. 24000.00 per hectare additional income through CFLDs.
- B:C ratio of CFLDs were recorded 4.64 than farmer's practices (3.82).

Table 5 Performance of groundnut production technology in Bikaner during Kharif 2018

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	33.80	29500	112800	83300	3.82
CFLDs	38.50	29500	136800	107300	4.64
% Increase	13.90	-	-	28.81	-



Field day organized at farmer's field

3. Yield

- Average yield of CFLDs was 38.50 q/ha, 12.06 q/ha higher than average district yield (26.44 q/ha), 14.70 q/ha higher than state average yield (23.80 q/ha) and 24.52 q/ha higher than national average yield (13.98 q/ha).
- Average yield of CFLDs was recorded 1.50 lower than potential yield (40.00 q/ha).

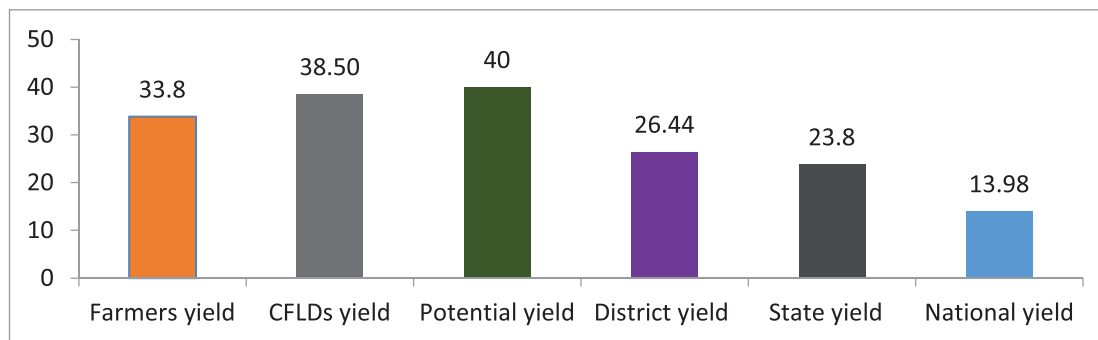


Fig. 5 Comparative average yield (q/ha) of groundnut in Bikaner district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.

5. Success point

- Timely sowing and recommended crop geometry managed the yield of groundnut.
- Balanced and need based use of fertilizers helped in increasing the yield.
- Weeds management through pre-emergence herbicide i.e., pendimethalin and post emergence herbicide Imazethapyr minimized the weeds population.
- Seed treatment and timely used of fungicides and insecticides helped in disease and insect management.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmers showed interest in following all parameters of crop improvement like; crop geometry, optimum seed rate, timely sowing, seed treatment, INM, IWM, IDM and IPM.
- Mr. Jagdish liked high yielding variety HNG-69. He also promotes this variety to other farmers.
- Farmers kept 20.00 quintal produce as seed and sold to farmers of village Nad, nearby villages have already ensured to purchase seed of HNG-69 variety of groundnut from him for Kharif 2019.
- He encouraged, good germination due to seed treatment, good weed control by herbicide, resulted in labour saving, better growth and development of plant, higher yield and income.

KRISHI VIGYAN KENDRA, BIKANER-I (RAJASTHAN)

Sh. Govind Ram S/o Sh. Shriram

Address: Village: Gusaisar Teh.: Bikaner,
District: Bikaner (Rajasthan)



1. Technology demonstrated

Variety: HNG 69

Seed rate: 80-100 kg/ha for spreading and semi-spreading varieties.

Nutrient management

- Application of 7-7.5 tons of FYM with Azotobactor & Phosphorus soluble bacteria 5 kg/ha.
- Application of 20 kg/ha N, 75 kg/ha P₂O₅ and 20 kg/ha Sulphur.
- Soil application of 25 kg ZnSO₄ and foliar spray of 0.5% ZnSO₄ at 45 and 60 DAS.

Weed management

- Spraying of pre emergence herbicide Pendimethalin 30% EC 3.30 liter/ha (1.0 liter a.i.).
- Spraying of post emergence herbicide imazethapyr 10% SL @ 750 ml/ha.

Disease management

- Seed treatment with Thiram/Mancozeb (3g/kg seed) or Carbendazim (2g/kg seed) or Tebuconazole (Raxil 2% DS) @ 1.25g/kg or Trichoderma viride 10 gm/kg seed.
- *Root and Collar Rot:* Above mention seed treatment and soil application of Trichoderma viride 2.5 kg + 100 kg cow dung per ha.
- *Tikka disease:* Spray of Mancozeb 75% WP 1-1.5 kg/ha.
- *Iron deficiency or Piliya Disease:* Foliar spray of 1% FeSO₄ at 30, 40 and 50 DAS.

Insect management

- *Termites:* Seed treatment with Chlorpyrifos 20% EC 4-5 ml or Imidacloprid 70% WS 5 gm/kg seed and Chlorpyrifos 20% EC 4 liter/ha with irrigation.
- *White grubs:* Soil application of Quinalphos 5% g or Carbofuran 3% G 25 kg/ha and Chlorpyrifos 20% EC 4 liter/ha with irrigation.

2. Performance of technology

- CFLDs were conducted on groundnut during Kharif 2019 at farmer's field of Bikaner district of Rajasthan.
- Average yield of CFLDs on groundnut was 40.90 q/ha, whereas in farmer's practices the yield was 36.20 q/ha.
- Average yield of groundnut was 12.98% higher than farmer's practices.
- Net income of CFLDs was Rs.149200.00 than under farmer's practices Rs.109800.00.
- Thus, farmers got Rs. 39400.00 per hectares as an additional income through CFLDs.
- B:C ratio of CFLDs were recorded as 5.26 compared to farmer's practices (4.14).

Table 6 Performance of groundnut production technology in Bikaner during Kharif 2019

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	36.20	35000	144800	109800	4.14
CFLDs	40.90	35000	184200	149200	5.26
% Increase	12.98	-	-	35.88	



Groundnut crop at farmer's field

3. Yield

- Average yield of CFLDs was 40.90 q/ha, 16.59 q/ha higher than average district yield (24.31q/ha), 20.61q/ha higher than state average yield (20.29 q/ha). It is compared with average yield of previous year.
- Average yield of CFLDs was recorded 1.10 q/ha lower as compared to potential yield (42.00 q/ha).

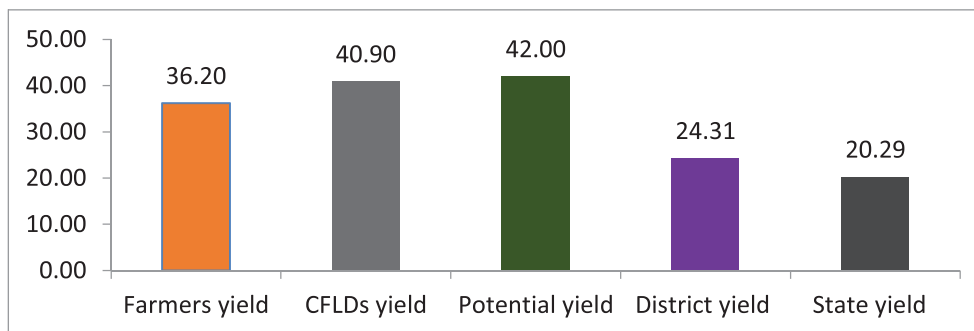


Fig. 6 Comparative average yield (q/ha) of groundnut in Bikaner district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.

5. Success point

- High yielding variety of groundnut gave maximum yield.
- Timely sowing and recommended crop geometry managed the yield of groundnut.
- Balanced and need based use of fertilizers helped in increasing the yield.
- Weeds management through pre emergence herbicide Pendimethalin and post emergence herbicide imazethapyr minimized the weeds population.
- Seed treatment and timely used of fungicides and insecticides helped in disease and insect management.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmers showed interest in follow the all parameters of crop improvement like; Crop geometry, optimum seed rate, timely sowing, seed treatment, INM, IWM, IDM and IPM.
- He liked high yielding groundnut variety i.e., HNG-69.
- He promoted this variety to other fellow farmers. He kept 20.00 quintal produce as seed and distribute to farmers of nearby villages.
- Farmers have already ensured to purchase seed of HNG-69 variety of groundnut from him for Kharif2020.
- Good germination was observed due to timely seed treatment, weed management by herbicide which resulted in labour saving, better growth and development of plant, better yield and income.

KRISHI VIGYAN KENDRA, MAHENDERGARH (HARYANA)

Sh. Kurdaram S/o Sh. Hardwari Lal

Address: VPO: Nangal Mala

District: Mahendergarh

Mobile: 9466038939



1. Technology demonstrated

Variety: HNG-69

Seed rate: 90-100 kg/ha

Nutrient management

- Application of 15 kg N + 50 kg P₂O₅ + 25 kg K₂O + 25 kg ZnSO₄ + 20 kg S/ha

Diseases and insect-pests

- Collar rot and root rot occurrence at the early crop stage seed treatment with Chlorpyrifos (15 ml/g seed) and captan (3g/kg seed) and termite and White grub attack at pod development stage were the main causes faced by the farmers.
- The problems were managed by application of recommended pesticides.

Weed management

- One hoeing at 35-40 DAS.

2. Performance of technology

- CFLDs on groundnut crop were conducted at farmers' field in 30.0 ha area during khraif-2018.
- Groundnut variety HNG-69 demonstrated with recommended package of practices gave an average yield of 22.1q/ha which was 23.4% higher than local check (17.9 q/ha).
- CFLDs yield ranged from 17.5 to 28.5 q/ha. However, Mr. Kurdaram harvested 28.5 q/ha yield.

Table 7 Performance of groundnut production technology in Mahendergarh during Kharif 2019

Particulars	Yield (q/ha)	% increase	Gross cost (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	BC ratio
Farmer practice	17.9	-	34150	71600	37450	2.09
CFLDs	22.1	23.4	38650	88400	49750	2.28
Successful farmer	28.5	-	38650	114000	75350	2.94



Field visit by Scientists of KVK, Mahendragarh

3. Yield

- CFLDs on groundnut were conducted at farmers' fields in Mahendergarh district during kharif–2018.
- Average yield of CFLDs was 22.1 q/ha which was 23.4 % higher than local check average of 17.9 q/ha. Average yield of CFLDs (22.1 q/ha) was also higher than the average of the crop at state (11.5 q/ha) and district (15.8 q/ha). However, Kurdaram, harvested the yield of 28.5q/ha yield.

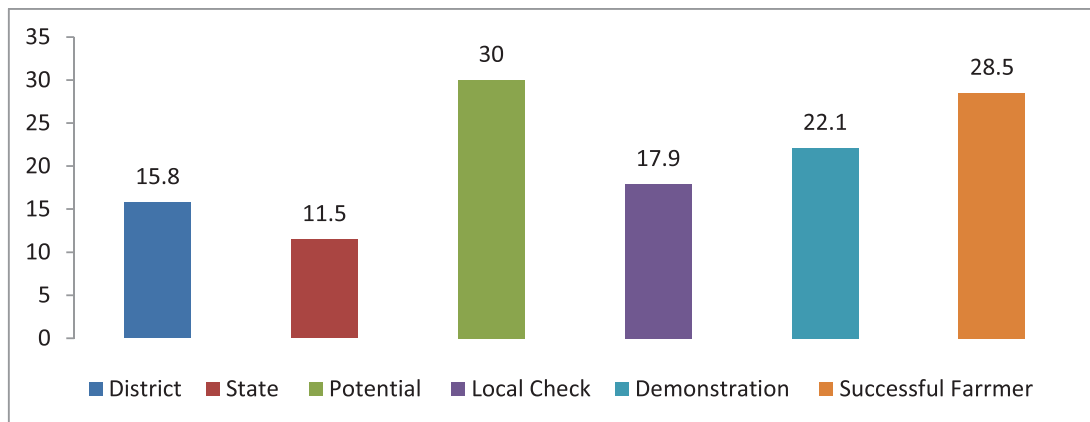


Fig. 7 Comparative average yield (q/ha) of groundnut in Mahendergarh district, Haryana



Field day organized at farmer's field

4. Institutional involvement

- Financial support for conducting CFLDs were provided by ICAR-ATARI, Zone-II, Jodhpur.
- Training cum group meeting for nodal officers of CFLDs on oilseeds was organized by ICAR-ATARI, Zone-II, Jodhpur.
- Effective implementation of CFLDs is done by the concerned nodal officers of KVKs.
- Field days were organized to show the impact of technologies demonstrated.

5. Success Point

- Use of quality seed of improved variety HNG-69, adoption of improved practices such as optimum seed rate, seed treatment, balanced application of fertilizers, timely weed management, insect-pest and disease management were main factors responsible for higher yield of CFLDs.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Quality seed of improved varieties needs to be made available at local level.
- Seed treatment with Chloropyriphos and Captan have been formed to manage termite and collar rot in groundnut.

KRISHI VIGYAN KENDRA, AMRELI (GUJARAT)

Sh. Dudhat Chandubhai Govindbhai

Address: Bambhaniya, Taluka: Kukavav-Vadiya
District: Amreli (Gujarat)



1. Technology demonstrated

Variety: GT 4

Seed rate: 2-2.5 kg /ha

Nutrient management

- 2-2.5 tons of FYM with Azotobactor & Phosphorus soluble bacteria 5 kg/ha.
- 40 kg/ha N, 25 kg/ha P₂O₅ and 20 kg/ha Sulphur.

Weed management

- Spraying of pre emergence herbicide Pendimethalin 30% EC 3.30 liter/ha (1.0 liter *a.i.*).

Disease management

- Seed treatment with mixture of Thiram 2g + Carbendazim 1g per kg seed or Trichoderma viride 10 gm/kg seed.
- *Stem and Root Rot*: Treat the seed with *T. viride* or *T. harzanium* or *Bacillus subtilis* (0.4%) or Thiram 75 SD (0.2%) + Bavistin (0.1%).
- *Phyllody disease*: To manage vector, spray of Imidachloprid 17.8% SL 250 ml/ha or Dimethoate 30% EC 500 ml/ha.

Insect management

- *Leaf Roller and Capsule Borer*: Two sprayings of Quinalphos 0.05% at 30 and 45 days after sowing.
- Two rounds of dusting with Phosalone 4%, Malathion 5% dusts 25 kg/ha at 30 and 45 days after sowing.
- *Gall Fly and Sesame Leaf Hopper*: Spraying of Dimethoate 0.03% at bud formation stage.
- *Hawk Moth*: Two rounds of dusting with Phosalone 4% or Malathion 5% dust 25 kg/ha, first at 30 DAS and second at 45 DAS.

2. Performance of technology

- CFLDs on sesame were organized during kharif 2016-17 at farmer's field of Amreli district of Gujarat.
- Full package of practices including improved variety, optimum seed rate, recommended crop geometry, seed treatment, integrated nutrient, weed, disease and pest management were demonstrated.
- Improved and proven technology of sesame under CFLDs, obtained 2.60q/ha higher yield (11.20 q/ha) than farmer's practice (8.60q/ha).
- Farmer got Rs. 16837.00 as additional income compared to her own practices (Rs. 45266.00 per ha).

Table 8 Performance of sesame production technology in Amreli during Kharif 2016

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	8.6	14007	59273	45266	4.23
CFLDs	11.2	15753	77856	62103	4.94
% Increase	30.23	-	-	37.20	-



KVK scientists visit at farmer's field

3. Yield

- Yield under CFLDs was recorded as 11.20 q/ha compared to farmer's practice (8.60 q/ha.)
- CFLDs yield was higher than farmers practice i.e., 2.60q.
- CFLDs yield was 5.26 and 5.86 q/ha higher than district average yield (5.94 q/ha) and state average yield (5.34 q/ha), respectively.
- National average yield (4.70 q/ha) was 6.50 q/ha lower than CFLDs yield.
- CFLDs yield was 3.50 q/ha higher as compared to the potential yield (7.70 q/ha) of GT 4 variety of sesame.

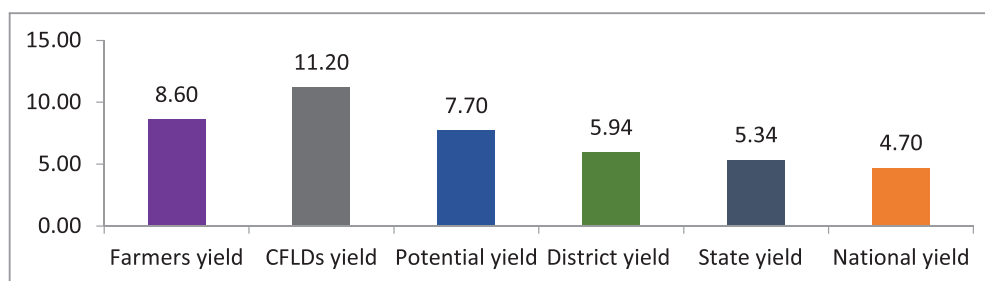


Fig. 8 Comparative average yield (q/ha) of sesame in Amreli district, Gujarat

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs.
- Timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.
- Farmers were imparted on campus training of two days before sowing of seeds.
- A close supervision was maintained during crop stages/entire season by scientists of KVK.

5. Success point

- Farmer obtained highest yield due to high yielding variety of sesame (GT 4).
- Optimum seed rate, seed treatment, integrated nutrient, weed, disease and pest management helped in increasing yield.
- Moderately tolerant variety against major diseases and insect pests.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmers' liked white seeded high yielding sesame variety (GT 4).
- Sesame variety GT 4 is moderately tolerant against major diseases and insect pests, which were found effective in increasing production and productivity of sesame.
- Farmers' have shown interest for increasing area in next kharif season.

KRISHI VIGYAN KENDRA JAIPUR-I (RAJASTHAN)

Sh. Gopal Singh S/o Sh. Bhagirath Daroga

Address: Village: Hattupura, Tehsil: Dudu,
District: Jaipur (Rajasthan)



1. Technology demonstrated

Variety: RT 351

Seed rate: 2-2.5 kg /ha

Nutrient management

- 2-2.5 tons of FYM with Azotobactor & Phosphorus soluble bacteria 5 kg/ha.
- 40 kg/ha N, 25 kg/ha P₂O₅ and 20 kg/ha Sulphur.

Weed management

- Spraying of pre emergence herbicide Pendimethalin 30% EC 3.30 liter/ha (1.0 liter a.i).

Disease management

- Seed treatment with mixture of Thiram 2g + Carbendazim 1g per kg seed or Trichoderma viride 10 gm/kg seed.
- *Stem and Root Rot*: Treat the seed with *T. viride* or *T. harzanium* or *Bacillus subtilis* (0.4%) or Thiram 75 SD (0.2%) + Bavistin (0.1%).
- *Phyllody disease*: To manage vector, spray of Imidacloprid 17.8% SL 250 ml/ha or Dimethoate 30% EC 500 ml/ha.

Insect management

- *Leaf Roller and Capsule Borer*: Two rounds of dusting with Phosalone 4%, Malathion 5% dusts 25 kg/ha at 30 and 45 days after sowing.
- *Gall Fly and Sesame Leaf Hopper*: Spraying of Dimethoate 0.03% at bud initiation stage.
- *Hawk Moth*: Two rounds of dusting with Phosalone 4% or Malathion 5% dust 25 kg/ha, first at 30 DAS and second at 45 DAS.

2. Performance of technology

- Under CFLDs, improved technologies viz., improved variety, optimum seed rate, recommended crop geometry, seed treatment, integrated nutrient, weed, disease and pest management were demonstrated.
- Improved technology of sesame, the yield under CFLDs was obtained 2.21 q/ha higher (7.07 q/ha) than farmer's practice (4.86 q/ha).
- Farmers got Rs. 12671.00 as an additional income compared to his own practices.

Table 9 Performance of sesame production technology in Jaipur during Kharif 2016

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	4.86	18826.00	34020.00	15194.00	1.81
CFLDs	7.07	21625.00	49490.00	27865.00	2.29
% Increase	45.47	-	-	83.39	-



Performance of sesame variety (RT 351) at farmer's field



Field day organized at farmer's field

3. Yield

- During kharif 2016, CFLDs on sesame was laid out at farmers' fields of Jaipur district of Rajasthan.
- CFLDs yield was obtained 7.07 q/ha compared to the farmers' practice (4.86 q/ha). This yield was 2.21q/ha higher than local.
- CFLDs yield was 4.44 and 4.19 q/ha higher than district average yield (2.63 q/ha) and state average yield (2.88 q/ha), respectively.
- National average yield (4.70 q/ha) was found 2.37q/ha lower than CFLDs yield.
- CFLDs yield was found 2.93 q lower than potential yield (10q/ha).

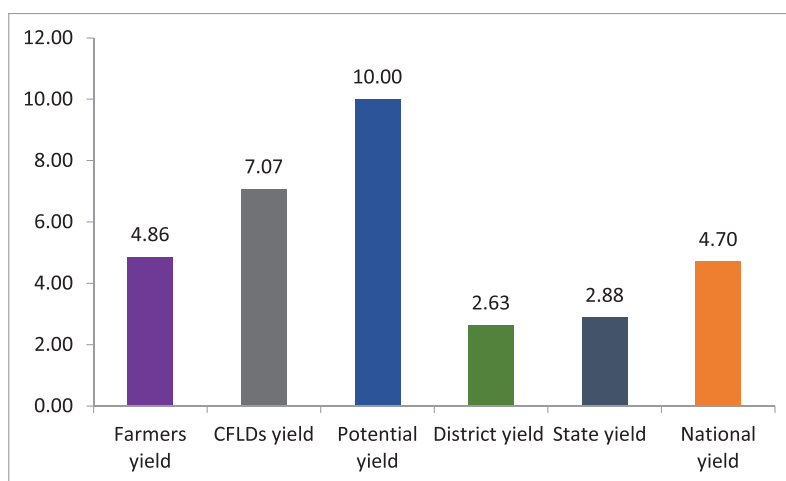


Fig. 9 Comparative average yield (q/ha) of sesame in Jaipur district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.
- Farmers were imported on campus training of two days before sowing.
- A close supervision was maintained during crop stages/entire season by scientists of KVK.
- Field days were organized with the involvement of state agricultural department and progressive farmers.

5. Success point

- Farmers obtained better yield due to improved variety of sesame (RT 351).
- Optimum seed rate, seed treatment, integrated nutrient, weed, disease and pest management helped in increasing yield.
- Moderately tolerant variety against major diseases and insect pests.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmers liked white seeded high yielding variety of Sesame.
- Sesame variety (RT 351) is moderately tolerant against major diseases and insect pests, which found effective in increasing production and productivity of sesame.

KRISHI VIGYAN KENDRA, DHOLPUR (RAJASTHAN)

Sh. Bhuvnesh S/o Sh. Gokul Singh

Address: Village: Moosalpur, Block: Sepau,
District: Dholpur



1. Technology demonstrated

Variety: RT 351

Seed rate: 2-2.5 kg /ha

Nutrient management

- Application of 2-2.5 tons of FYM with Azotobactor & Phosphorus soluble bacteria 5 kg/ha.
- Application of 40 kg/ha N, 25 kg/ha P₂O₅ and 20 kg/ha Sulphur.

Weed management

- Spraying of pre emergence herbicide Pendimethalin 30% EC 3.30 liter/ha (1.0 liter a.i).

Disease management

- Seed treatment with mixture of Thiram 2g + Carbendazim 1g per kg seed or Trichoderma viride 10 gm/kg seed.
- *Stem and Root Rot*: Treat the seed with *T. viride* or *T. harzanium* or *Bacillus subtilis* (0.4%) or Thiram 75 SD (0.2%) + Bavistin (0.1%).
- *Phyllody disease*: To control vector, spray of Imidacloprid 17.8% SL 250 ml/ha or Dimethoate 30% EC 500 ml/ha.

Insect management

- *Leaf Roller and Capsule Borer*: Two rounds of dusting with Phosalone 4%, Malathion 5% dusts 25 kg/ha at 30 and 45 days after sowing.
- *Gall Fly and Sesame Leaf Hopper*: Spraying of Dimethoate 0.03% at bud initiation stage.
- *Hawk Moth*: Two rounds of dusting with Phosalone 4% or Malathion 5% dust 25 kg/ha, first at 30 DAS and second at 45 DAS.

2. Performance of technology

- CFLDs were demonstrated on sesame during kharif 2017-18 at farmer's field of Dholpur district of Rajasthan.
- Components of improved technology i.e., improved variety, optimum seed rate, recommended crop geometry, seed treatment, integrated nutrient, weed, disease and pest management were followed.
- Due to proven technology of sesame gave 3.90q/ha higher yield (9.90 q/ha) than farmer's practice (6.00 q/ha).
- Farmer got Rs.5600.00 as an additional income compared to old practices (Rs.24720.00 per ha).

Table 10 Performance of Sesame production technology in Dholpur during Kharif 2017

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	6.00	14500	39220	24720	2.70
CFLDs	9.90	16850	47170	30320	2.80
% Increase	60.00	-	-	22.65	-



Dr. Subhash Chandra's visit: Field day organized at farmer's field

3. Yield

- During kharif 2017-18, CFLDs on sesame was laid out at farmer's field of Dholpur district of Rajasthan.
- Yield under CFLDs was found 9.90 q/ha compared to farmers practice (6.00 q/ha).
- Yield under CFLDs was 3.95 and 7.21q/ha higher than district yield (5.95q/ha) and state yield (2.69 q/ha), respectively.
- National average yield (4.78 q/ha) of sesame was 5.12q/ha lower than CFLDs yield.
- CFLDs yield was found as 1.90q/ha higher than potential yield (8.00 q/ha) of RT-351.

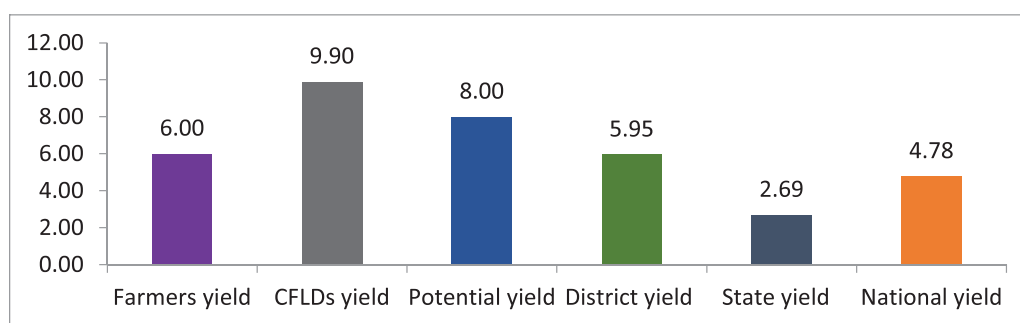


Fig. 10 Comparative average yield (q/ha) of sesame in Dholpur district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.
- Farmers were imported on campus training of two days before sowing of crop. A close supervision was maintained during crop stages/entire season by scientists of KVK.

5. Success point

- Farmers obtained better yield due to improved variety RT-351.
- Optimum seed rate, seed treatment, integrated nutrient, weed, disease and pest management helped in increasing yield.
- Moderately tolerant variety against major diseases.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmer prefer white seeded high yielding variety of Sesame.
- Sesame variety i.e., RT 351 moderately tolerant against major diseases and insect pests, which were found effective in increasing production and productivity of sesame.



KRISHI VIGYAN KENDRA, MAHENDERGARH (HARYANA)

Sh. Sanjay S/o Sh. Jagdish

Address: VPO: Dholera,

District: Mahendergarh

Mobile: 9467260105



1. Technology demonstrated

Variety: RT-351

Seed rate: 2.5 to 3.0 kg/ha

Nutrient management

- Application of 40 kg N+15 kg P₂O₅+20 kg S/ha.

Diseases and insect-pests

- Root rot and Phyllody were the disease reported during crop growing season.
- Root rot disease was managed by seed treatment practice with Thiram @ 3 g/ kg seed.
- Attack of Chaffer beetle was noticed during the season. The insect pest was controlled effectively by application of recommended pesticides i.e. Malathion @ 500 ml/ ha for jassid and leaf folder management.

Weed management: One hoeing at 25 DAS.

2. Performance of technology

- CFLDs on sesame were conducted at farmers' field in 20.0 ha area during khraif-2017.
- Sesame variety (RT-351) was demonstrated with recommended package of practices which gave an average yield of 5.98 q/ha.
- CFLDs yield was 23.8% higher than local (4.83q/ha).
- Range of yield of CFLDs were from 4.0 to 10.5q/ha. In which, Mr. Sanjay harvested maximum yield of 10.5 q/ha.

Table 11 Performance of Sesame production technology in Mahendergarh during Kharif 2017

Particulars	Yield (q/ha)	% ncrease	Gross cost (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ ha)	BC ratio
Farmer Practice	4.83	-	15280	34776	26681	2.62
CFLDs	5.98	23.8	16375	43056	19496	2.27
Successful farmer	10.5	-	16375	75600	59225	4.61



Visit of KVK scientists at farmer's field

3. Yield

- CFLDs on Sesame were conducted at farmers' fields in Mahendergarh district during kharif – 2017.
- An average yield of 5.98 q/ ha was observed under CFLDs. It was 23.8 % higher than local (4.83q/ha).
- Yield of CFLDs (5.98 q/ha) was higher than state yield (3.5 q/ha) and district yield (4.2 q/ha).
- Mr. Sanjay harvested a maximum yield of 10.5 q/ha.

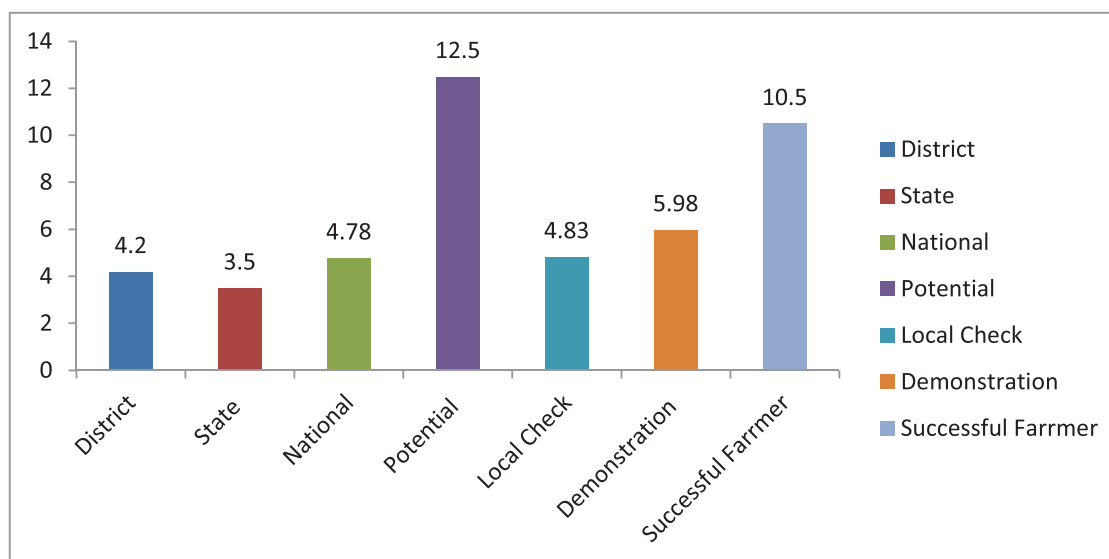


Fig. 11 Comparative average yield (q/ha) of Sesame in Mahendergarh district, Haryana

4. Institutional involvement

- Financial support for purchase of critical inputs under CFLDs was provided by ICAR- ATARI, Zone-II, Jodhpur.
- Training-cum-group meeting for nodal officers of CFLDs was organized by ICAR-ATARI, Zone-II, Jodhpur.
- Monitoring of CFLDs was done regularly by team of KVK, ICAR-ATARI and ICAR officials.
- Field days were organized to show the impact of technologies demonstrated.

5. Success point

- Use of quality seed of improved variety (RT-351) and use of improved practices such as optimum seed rate, seed treatment, balanced application of fertilizers, timely weed management, insect-pest and disease management were adopted for higher yield under CFLDs.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Variety RT-351 is tolerant to bacterial leaf blight disease.
- Incidence of phyllody disease was very less
- Seed was of good quality needs further diffusion of technology among fellow farmers.

KRISHI VIGYAN KENDRA, BHARATPUR (RAJASTHAN)

Sh. Hardayal Sharma S/o Sh. Khusi Ram Sharma

Address: Village: Ajaypura, Block: Kumher,
District: Bharatpur



1. Technology demonstrated

Variety: RT 351

Seed rate: 2-2.5 kg /ha

Nutrient management

- Application of 2-2.5 tons of FYM with Azotobactor & Phosphorus soluble bacteria 5 kg/ha.
- Application of 40 kg/ha N, 25 kg/ha P₂O₅ and 20 kg/ha Sulphur.

Weed management

- Spraying of pre emergence herbicide Pendimethalin 30% EC 3.30 liter/ha (1.0 liter a.i).

Disease management

- Seed treatment with mixture of Thiram 2g + Carbendazim 1g per kg seed or Trichoderma viride 10 gm/kg seed.
- *Stem and Root Rot*: Treat the seed with *T. viride* or *T. harzanium* or *Bacillus subtilis* (0.4%) or Thiram 75 SD (0.2%) + Bavistin (0.1%).
- *Phyllody disease*: To manage vector, spraying of Imidachloprid 17.8% SL 250 ml/ha or Dimethoate 30% EC 500 ml/ha.

Insect management

- *Leaf Roller and Capsule Borer*: Two sprays of Monocrotophos 0.05% or Quinalphos 0.05% at 30 and 45 days after sowing.
- Two rounds of dusting with Phosalone 4%, Malathion 5% dusts 25 kg/ha at 30 and 45 days after sowing.
- *Gall Fly and Sesame Leaf Hopper*: Spraying of Dimethoate 0.03% at bud initiation stage.
- *Hawk Moth*: Two rounds of dusting with Phosalone 4% or Malathion 5% dust 25 kg/ha, first at 30 DAS and second at 45 DAS.

2. Performance of technology

- CFLDs on sesame (RT-351) were conducted during kharif 2018 in Bharatpur district of Rajasthan.
- Full package of practices including, improved variety, optimum seed rate, recommended crop geometry, seed treatment, integrated nutrient, weed, disease and pest management were demonstrated among farmers.
- Under CFLDs, yield was found to be 1.60q/ha higher (6.80q/ha) than farmer's practice (5.20q/ha).
- Farmer got Rs. 7998.00 as additional income compared to own practices (Rs. 15495.00).

Table 12 Performance of sesame production technology in Bharatpur during Kharif 2018

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	5.20	17000	32495	15495	1.91
CFLDs	6.80	19000	42493	23493	2.24
% Increase	30.77	-	-	51.62	-



Field visit by KVK, scientist at farmer's field



Field day organized at farmer's field

3. Yield

- The yield under CFLDs was noticed as 6.80 q/ha compared to farmer's practice (5.20q/ha).
- CFLDs yield was 2.84 and 3.33 q/ha higher than district yield (3.96 q/ha) and state yield (3.47 q/ha), respectively.
- National yield (4.78 q/ha) was 2.02q/ha lower than CFLDs yield.
- CFLDs yield was 1.20 q/ha lower than potential yield (8.00 q/ha) of RT 351 variety.

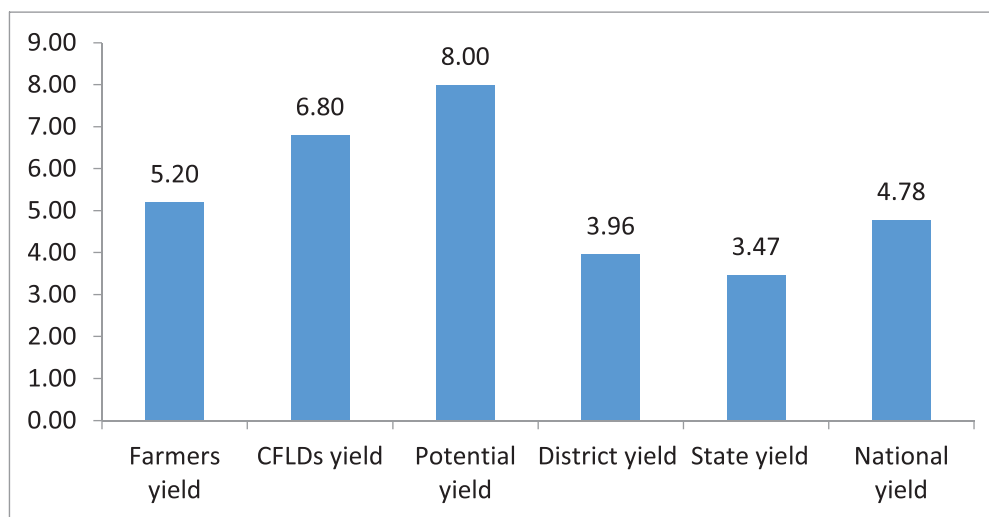


Fig. 12 Comparative average yield (q/ha) of sesame in Bharatpur district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical sessions and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities, etc.
- Farmers were given on campus training of two days before sowing provided to partner farmers.
- A close supervision was maintained during crop stages/entire season by scientists of KVK.

5. Success point

- Farmer obtained highest yield due to improved yielding variety RT 351.
- Optimum seed rate, seed treatment, integrated nutrient, weed, disease and pest management helped in increasing the yield.
- Moderately tolerant variety against major diseases.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmer prefer white seeded, multi podded and high yielding variety of Sesame.
- Sesame variety (RT 351) was moderately tolerant against major diseases, which was found effective in increasing increased production and productivity of sesame.

KRISHI VIGYAN KENDRA, REWARI (HARYANA)

Sh. Ramnarayan S/o Sh.Tara Chand

Address: Village: Khaliawas,
District: Rewari



1. Technology demonstrated

Variety: RT 351

Seed rate: 2-2.5 kg/ha

Nutrient management

- 2-2.5 tons of FYM with Azotobactor & Phosphorus soluble bacteria 5 kg/ha.
- 40 kg/ha N, 25 kg/ha P₂O₅ and 20 kg/ha Sulphur.

Weed management

- Spraying of pre emergence herbicide Pendimethalin 30% EC 3.30 liter/ha (1.0 liter a.i).

Disease management

- Seed treatment with mixture of Thiram 2g + Carbendazim 1g per kg seed or Trichoderma viride 10 gm/kg seed.
- *Stem and Root Rot*: Treat the seed with *T. viride* or *T. harzanium* or *Bacillus subtilis* (0.4%) or Thiram 75 SD (0.2%) + Bavistin (0.1%).
- *Phyllody disease*: To manage vector, spraying of Imidachloprid 17.8% SL 250 ml/ha or Dimethoate 30% EC 500 ml/ha.

Insect management

- *Leaf Roller and Capsule Borer*: Two spraying of Quinalphos 0.05% at 30 and 45 days after sowing.
- *Gall Fly and Sesame Leaf Hopper*: Spraying crop at bud initiation stage with Dimethoate 0.03%.
- *Hawk Moth*: Two rounds of dusting with Phosalone 4% or Malathion 5% dust 25 kg/ha, first at 30 DAS and second at 45 DAS.

2. Performance of technology

- CFLDs were demonstrated on sesame during kharif 2017-18 at farmer's field of Rewari district of Haryana.
- During conducting CFLDs on sesame at farmer's field improved technologies viz., improved variety, optimum seed rate, recommended crop geometry, seed treatment, integrated nutrient, weed, disease and pest management were followed.
- Due to proven technology of sesame, 1.75q/ha higher yield was obtained under CFLD (5.75 q/ha) than farmer's practice (4.00 q/ha).
- Farmer got Rs. 12075.00 as additional income compared to her own practices (Rs. 10000.00 per ha).

Table 13 Performance of sesame production technology in Rewari during Kharif 2018

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	4.00	22000	32000	10000	1.45
CFLDs	5.75	23925	46000	22075	1.92
% Increase	43.75			120.75	



KVK scientists visit at farmer's field

3. Yield

- During kharif 2017-18, sesame CFLDs was laid out at farmer's field of Rewari district of Haryana.
- CFLDs yield was found 5.75q/ha compared to farmer's practice (4.00q/ha) that was 1.75 q/ha lower than CFLDs yield.
- CFLDs yield was 2.50 and 2.25 q/ha higher than district average yield (3.25 q/ha) and state average yield (3.50 q/ha), respectively.
- National yield (4.78 q/ha) was 0.97q/ha lower than CFLDs yield.
- CFLDs yield was 2.25q/ha higher than potential yield (8.00 q/ha) of RT 351 variety.

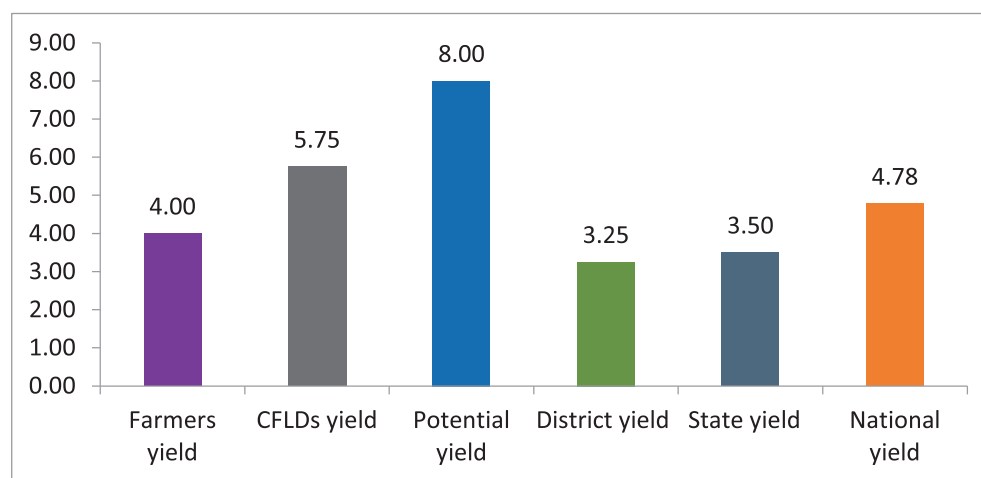


Fig. 13 Comparative average yield (q/ha) of sesame in Rewari district, Haryana

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical sessions and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.
- Farmers were imported on campus training of two days before sowing of crop. A close supervision was maintained during crop stages/entire season by scientists of KVK.

5. Success point

- Farmers obtained highest yield due to used improved variety of sesame (RT 351).
- Optimum seed rate, seed treatment, integrated nutrient, weed, disease and pest management helped in increasing yield.

- Moderately tolerant variety against major diseases.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmer prefer white seeded high yielding variety of Sesame.
- Sesame variety (RT 351) was moderately tolerant against major diseases which were found effective in increasing production and productivity of sesame.

KRISHI VIGYAN KENDRA, JAIPUR-I (RAJASTHAN)

Sh. Madan Lal S/o Sh. Bhorilal Jat

Address: Village: Udaipuriya, P.S.: Chaksu
District: Jaipur



1. Technology demonstrated

Variety: RT 351

Seed rate: 2-2.5 kg /ha

Nutrient management

- Application of 2-2.5 tons of FYM with Azotobacter & Phosphorus soluble bacteria 5 kg/ha.
- Application of 40 kg/ha N, 25 kg/ha P₂O₅ and 20 kg/ha Sulphur.

Weed management

- Spraying of pre emergence herbicide Pendimethalin 30% EC 3.30 liter/ha (1.0 liter a.i).

Disease management

- Seed treatment with mixture of Thiram 2g + Carbendazim 1g per kg seed or Trichoderma viride 10 gm/kg seed.
- *Stem and Root Rot*: Treat the seed with *T. viride* or *T. harzanium* or *Bacillus subtilis* (0.4%) or Thiram 75 SD (0.2%) + Bavistin (0.1%).
- *Phyllody disease*: To control vector, spraying of Imidacloprid 17.8% SL 250 ml/ha or Dimethoate 30% EC 500 ml/ha.

Insect management

- *Leaf Roller and Capsule Borer*: Two spraying of Quinalphos 0.05% at 30 and 45 days after sowing.
- Two rounds of dusting with Phosalone 4%, Malathion 5% dusts 25 kg/ha at 30 and 45 days after sowing.
- *Gall Fly and Sesame Leaf Hopper*: Spraying of Dimethoate 0.03% at bud formation stage.

2. Performance of technology

- CFLDs were demonstrated on sesame during kharif 2019 at farmer's field of Jaipur district of Rajasthan.
- During conducting CFLDs on sesame at farmer's field, improved technologies like, improved variety, optimum seed rate, recommended crop geometry, seed treatment, integrated nutrient, weed, disease and pest management were followed.
- The farmer got Rs. 25027.00 as additional income compared to her own practices (Rs. 14925.00 per ha).

Table 14 Performance of sesame production technology in Jaipur during Kharif 2019

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	4.65	15230	30155	14925	1.98
CFLDs	8.90	17765	57717	39952	3.25
% Increase	91.40	-	-	167.69	-



Field visit by KVK scientists at farmer's field

3. Yield

- During kharif 2019, sesame CFLDs was laid out at farmer's field of Jaipur district of Rajasthan.
- Under CFLDs, the yield was 8.90 q/ha compared to farmer's practice (4.65 q/ha) that was 4.25 q/ha lower than CFLDs yield.
- CFLDs yield was 4.78 and 5.42 q/ha higher than previous year's district yield (4.12 q/ha) and previous year's state average yield (3.48 q/ha), respectively.
- CFLDs yield was equal to potential yield (9.00 q/ha) of RT 351 variety of sesame.

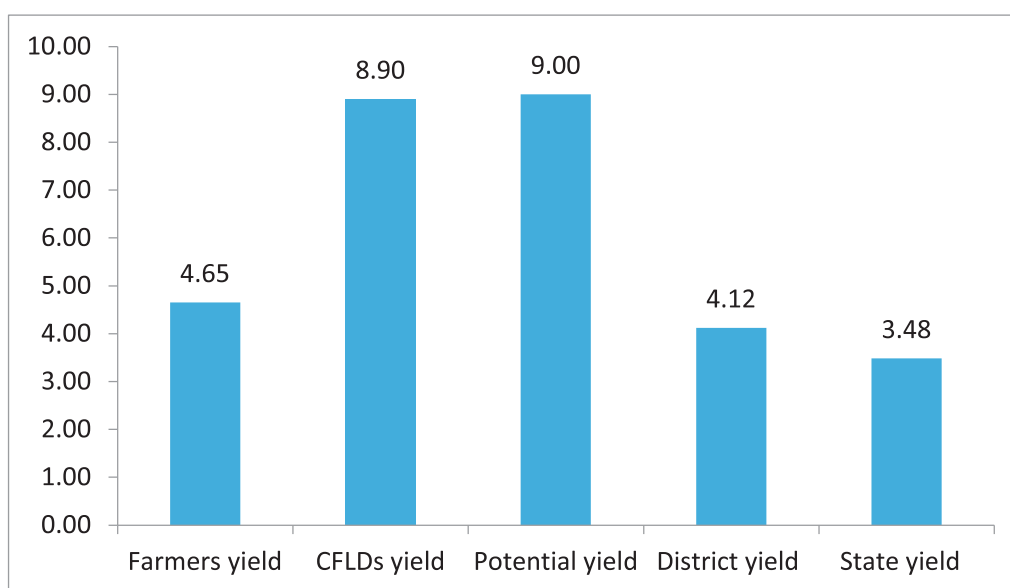


Fig. 14 Comparative average yield (q/ha) of sesame in Jaipur district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.
- Farmers were given on campus training of two days before seed was given to partner farmers.
- A close supervision was maintained during crop stages/entire season by scientists of KVK.

5. Success point

- The farmer obtained better yield as used of improved variety of sesame RT 351, as compare to local variety used by him.

- Optimum seed rate, seed treatment, integrated nutrient, weed, disease and pest management helped in increasing yield.
- Moderately tolerant variety against major diseases and insect pests.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmer prefer white seeded, multi podded and high yielding variety of Sesame.
- Sesame variety (RT 351) is moderately tolerant against major diseases and insect pests, which were found effective in increasing production and productivity of sesame.

KRISHI VIGYAN KENDRA, MAHENDERGARH (HARYANA)

Sh. Parmanand S/o Sh. Mahavir Parsad

Address: VPO: Meghot Binja

District: Mahendergarh

Mobile: 9306653867



1. Technology demonstrated

Variety: RT-351

Seed rate: 2.5-3.0 kg/ha

Nutrient management

- Application of 40 kg N+15 kg P₂O₅ + 20 kg S/ha.

Diseases and insect-pests

- Root rot and Phyllody were the disease reported during crop growing season.
- Root rot disease was managed by seed treatment practice with Thiram @ 3 g/ kg seed.
- Attack of Chaffer beetle was noticed during the season. The insect pest was managed effectively by application of recommended pesticides i.e. Malathion @ 500 ml/ ha for jassids and leaf folder management.

Weed management

- One hoeing at 25 DAS.

2. Performance of technology

- CFLDs on sesame crop was conducted at farmers' field in 30.0 ha area during khraif-2019.
- Sesame variety i.e., RT-351, grown in CFLDs with recommended package of practices gave an average yield of 5.78 q/ha which was 20.4 percent higher than local check average of 4.80 q/ha. CFLDs yield ranged from 4.5 to 7.5 q/ ha.
- Mr. Parmanand-successful farmer harvested 7.5 q/ha yield.

Table 15 Performance of sesame production technology in Mahendergarh during Kharif 2019

Technology	Yield (q/ha)	% increase	Gross cost (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ ha)	BC ratio
Farmer practice	4.8	-	17700	52800	35100	2.98
CFLDs	5.78	20.4	18755	63580	44825	3.39
Successful farmer	7.5	-	18755	82500	63745	4.39



Field visit by scientists of KVK

3. Yield

- CFLDs on Sesame were conducted at farmers' fields in Mahendergarh district during kharif-2019.
- The average yield of CFLDs was found as 5.78 q/ha which was 20.04 % higher than local variety (4.8 q/ha).
- Yield of CFLDs (5.78 q/ha) was higher than state yield (3.5 q/ha) and district yield (4.1 q/ha).
- Mr. Parmanand harvested the yield of 7.5 q/ha.

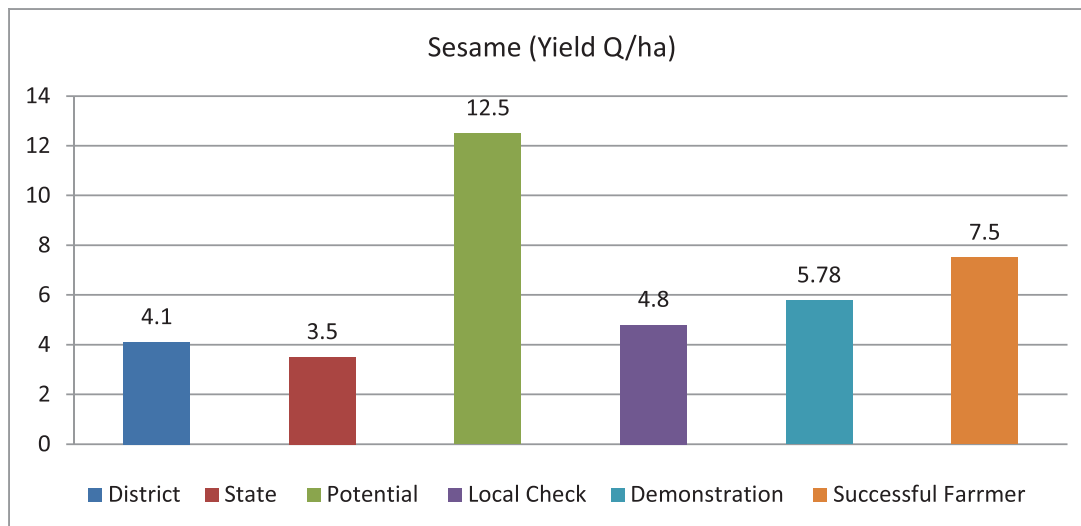


Fig. 15 Comparative average yield (q/ha) of sesame in Mahendergarh district, Haryana

4. Institutional involvement

- CFLDs on oilseeds are conducted by KVKs at farmer's field under NFSM project.
- Financial support for critical inputs under CFLDs was provided by ICAR-ATARI, Zone-II, Jodhpur.
- Training cum group meeting for nodal officers of CFLDs on oilseeds was organized by ICAR-ATARI, Zone-II, Jodhpur.
- Effective implementation of CFLDs was done by concerned nodal officer of ATARI, Ministry of Agriculture and Farmers Welfare.
- Field days were organized to show efficacy of proven technologies in collaborative mode with state agriculture department.

5. Success point

- Use of quality seed of sesame (variety RT-351).
- Used of improved practices such as optimum seed rate, seed treatment, balanced application of fertilizers, timely weed management, insect-pest and disease management.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Variety RT-351 is tolerant to bacterial leaf blight disease.
- Incidence of phyllody disease was very less
- Seed was of good quality.

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KRISHI VIGYAN KENDRA, JHALAWAR (RAJASTHAN)

Sh. Prakash Patidar

Address: Village: Chchhlao, Teh. - Pirawa
District: Jhalawar (Rajasthan)



1. Technology demonstrated

Variety: JS-9560

Seed rate: 80 kg /ha.

Seed Treatment

- Seed treatment with *Trichoderma viride* 5 gm/kg seed, Chloropyriphos 5 ml/kg seed.
- Rhizobium and PSB culture 500 ml/80 kg seed.

Nutrient management

- N:P:K:S (20:40:20:20)-20 kg/ha N, 40 kg/ha P₂O₅, 20 kg/ha, K₂O and 20 kg/ha Sulphur.

Weed management

- Spraying of Sodium Acifluorfen 16.5 % + Clodinofof propargyl 8 % EC 1 liter/ha after 20-25 DAS.

Disease management

- *Yellow Mosaic disease*: To manage vector, spray of Dimethoate 30% EC 1 liter/ha.

Insect management

- *Girdle Beetle*: Spraying of Profenofos 25 EC 2 ml/liter with water.
- *Green Semilooper*: Spraying of Quinalphos 25 EC 2 ml/liter with water.

2. Performance of technology

- CFLDs were conducted on Soybean under NMOOP during Kharif 2016 at farmer's field of Jhalawar district of Rajasthan.

- CFLDs on Soybean at farmer's field were organized on improved technologies like, improved variety, optimum seed rate, seed treatment recommended crop geometry, seed treatment, integrated nutrient, weed, disease and pest management were demonstrated. Proven technology of Soybean under CFLDs helped to obtain 21.00 q/ha higher yield as compared to farmer's practice (17.75 q/ha).
- Farmers got Rs. 29375.00 net income under demonstration and he got Rs. 8002.00 as an additional income compared to his own practices.

Table 16 Performance of soybean production technology in Jhalawar during Kharif 2016

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	17.75	31256	52629	21373	1.68
CFLDs	21.00	32890	62265	29375	1.89
% Increase	18.31	-	-	37.44	-



KVK scientists visit at farmer's field

3. Yield

- During Kharif 2016, CFLDs on Soybean was conducted at farmers' field of Jhalawar district of Rajasthan.
- Yield of CFLDs was 21.00 q/ha, while at farmer check was recorded 17.75 q/ha.
- CFLDs yield was 21.00 q/ha and 9.00 q/ha higher than district average (12.00 q/ha) and 9.50 q/ha higher than state average yield (11.50 q/ha).
- Although, potential yield of JS-9560 variety was 1.00 q/ha higher than CFLDs yield.

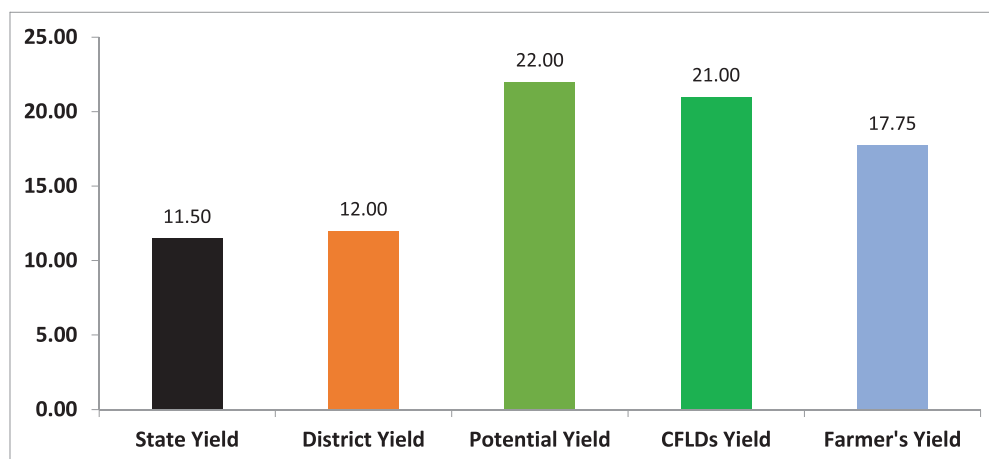


Fig. 16 Comparative average yield (q/ha) of Soybean in Jhalawar district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs implementing CFLDs.
- Nodal officers of KVKs imparted training for partners before implementation of CFLDs, timely field visits made by scientists, telephonic advisory/consultancy, extension activities, etc.
- Four days on campus training with view to demonstrate improved production technology for soybean was conducted before sowing.
- A close supervision was maintained during different crop stages/entire season by scientists of KVK, Jhalawar.

5. Success point

- Farmer obtained better yield due to improved and short duration variety compared to local variety.
- Optimum seed rate, proper seed treatment, balanced nutrient management, effective weed management, timely disease and pest management were the major key practices in increasing yield.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmer appreciated high yielding and short duration variety of Soybean (JS-9560).
- Due to proper seed treatment, seed germination was observed higher.
- JS-9560 variety was moderately resistant to disease.

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KRISHI VIGYAN KENDRA, JHALAWAR (RAJASTHAN)

Sh. Hemraj Gurjar S/o Sh. Bapu Lal Gurjar

Address: Village-Talwadiya, Tehsil: Asnawar/Jhalarapatan,
District- Jhalawar, Rajasthan



1. Technology demonstrated

Variety: JS 20-29

Seed rate: Seed rate 70-80 kg/ha

Nutrient management

- 15-20 tons of FYM or compost.
- 20 kg/ha N, 40 kg/ha P₂O₅, 20 kg/ha K and 20 kg/ha Sulphur.
- Two foliar spraying of FeSO₄ (0.5%) and ZnSO₄ (0.5%) at 45 and 60 DAS.

Weed management

- Spraying of pre emergence herbicide Pendimethilin 30% EC 3.30 liter/ha.
- Spraying of post emergence herbicide Imyzathyper 10% SL @ 750 ml/ha.

Disease management

- Seed treatment with mixture of Thiram + Carbendazim 1:1 @ 3g/kg seed or Trichoderma viride 10 gm/kg seed.
- *Seeding Rot*: Seed treatment with Carbendazim @ 2g /kg seed.
- *Pod Blight or Anthracnose*: Spray of Zineb @ 2.5 kg/ha/500-600 liter water.
- *Rust*: Spraying of Mancozeb 75% WP @ 2.5 kg/ha/1000 lit water or Carbendazim @ 1.00 kg/ha.

Insect management

- *Girdle Beetle*: Spraying of Profenofos (2 ml/l).
- *Stem fly*: Soil application of Phorate granules (15 kg/ha) or Spray of Indoxacarb (0.6 ml/l) or Thiamethoxam (0.2 g/l).
- *Green semilooper*: Spraying of Bacillus thuringiensis var. Kurstaki (1 g/l) or Indoxacarb (0.6 ml/l) or Profenofos (2 ml/l).
- *Whitefly*: Spraying of Imidachloprid 17.8% SL @ 250 ml/ha at flowering stage.

2. Performance of technology

- CFLDs were conducted on soybean during Kharif 2017-18 at farmer's field of Jhalawar district of Rajasthan.
- It was observed that the average yield of soybean CFLDs was 20.80 q/ha, where as in farmer's practices yield was 15.00 q/ha.
- The average yield of soybean CFLDs was 38.67% higher than that of farmer's practices.
- The net income of CFLDs was Rs. 20386.00, while farmer's practices net income was Rs. 11653.00. Thus, farmers got Rs. 8733.00 per hectare additional income through CFLDs.
- B:C ratio of CFLDs were recorded 1.74 as compared to farmer's practices 1.45, which lower from CFLDs.

Table 17 Performance of soybean production technology in Jhalawar during Kharif 2017

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	15.00	25912	37565	11653	1.45
CFLDs	20.80	27547	47933	20386	1.74
% Increase	38.67	-	-	74.94	-



Field day organized at farmer's field

3. Yield

- It was observed that the average yield of CFLDs was 20.80 q/ha, which was 7.31 q/ha higher than average district yield (13.49 q/ha), 8.21 q/ha higher than state average yield (12.59 q/ha) and 10.31 q/ha higher than national average yield (10.49 q/ha). Although, the average yield of CFLDs was recorded 9.20 q/ha lower as compared to potential yield (30.00 q/ha).

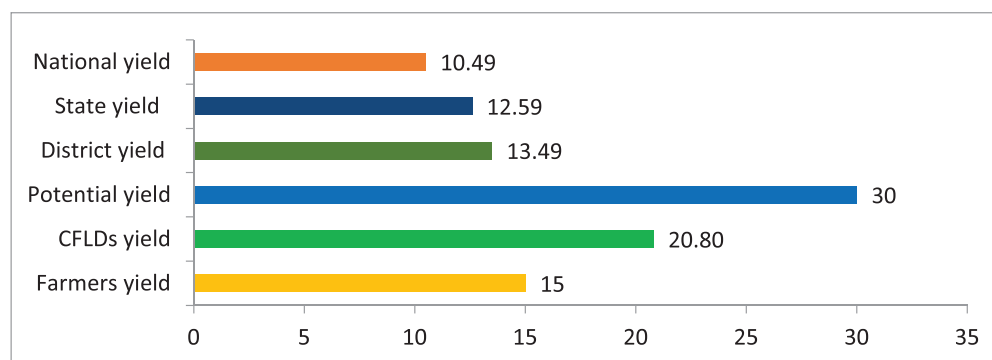


Fig. 17 Comparative average yield (q/ha) of soybean in Jhalawar district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.

5. Success point

- Improved variety of soybean gave better yield.
- Timely sowing and recommended crop geometry enhanced the yield of soybean.
- Balanced and need based use of fertilizers helped in increasing the yield.
- Weeds management through pre emergence herbicide Pendimethilin and post emergence herbicide Imyzathyper minimized the weeds population.
- Seed treatment and timely application of fungicides and insecticides helped in disease and insect management.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- The farmer faced more losses due to attack of Girdle beetle in soybean, because he did not manage this insect at initial stage. After the help of KVK scientist, he follows the control measures of Girdle beetle and save his soybean crop.
- The farmer showed interest to follow all parameters of crop improvement like; Crop geometry, optimum seed rate, timely sowing, seed treatment, Integrated Nutrient Management, Integrated Weed Management, Integrated Disease Management and Integrated Pest Management.

KRISHI VIGYAN KENDRA, JHALAWAR (RAJASTHAN)

Sh. Shambhu Dayal S/o Sh. Ramgopal Bairwa

Address: Village: Aloda, Block: Khanpur,
Disrict: Jhalawar (Rajasthan) 326038



1. Technology demonstrated

Variety: JS 20-29

Seed rate: 75-80 kg/ha

Nutrient management

- Application of 15-20 tons of FYM or compost.
- Application of 20 kg/ha N, 40 kg/ha P₂O₅, 20 kg/ha K and 20 kg/ha Sulphur.

Seed treatment

- Seed treat with mixture of Thiram + Bavistin 1:1 @ 3g/kg seed or Trichoderma viride 10 gm/kg seed.
- Seed inoculation: Seed inoculation of 500 ml/80 kg seed Rhizobium culture + Phosphorus Solubilizing Bacteria 500 ml/80 kg seed.

Weed Management

- Spraying of Sodium Acefluorfen 16.5 % + Clodinofop propargyl 8% EC (Ready Mixed product) @ 1000 ml/ha at 20-25 days after sowing.

Disease management

- *Seeding Rot*: Seed treat with Carbendazim @ 2g /kg seed
- *Pod Blight or Anthracnose*: Spray Zineb @ 2.5 kg/ha/ 500-600 liter water
- *Rust*: Spraying Mencozeb 75 WP @ 2.5 kg/ha/1000 lit water or Carbendazim @ 1.00 kg/ha

Insect pest management

- *Girdle Beetle*: Spraying of Profenofos 2.0 ml/litre of water.
- *Stem fly*: Soil application of Phorate granules (15 kg/ha) or Spraying Indoxacarb (0.6 ml/l) or Thiamethoxam (0.2 g/l).
- *Green semilooper*: Spraying of Bacillus thuringiensis var. Kurstaki (1 g/l) or Indoxacarb (0.6 ml/l) or Profenofos (2 ml/l).
- *Whitefly*: Spraying of Imidachloprid @ 250 ml/ha (0.5 ml/litre water).

2. Performance of technology

- CFLDs were conducted on soybean during Kharif 2017-18 at farmer's field of Jhalawar district of Rajasthan.
- It was observed that the average yield of soybean CFLDs was 17.45 q/ha, where as in farmer's practices yield was 13.35 q/ha.
- The average yield of soybean CFLDs was 30.71% higher than that of farmer's practices. The net income of CFLDs was Rs. 25245.00, while farmer's practices net income was Rs. 15810.00.
- Thus, farmers got Rs. 9435.00 per hectare additional income through CFLDs. B:C ratio of CFLDs were recorded 1.88 as compared to farmer's practices 1.62, which lower from CFLDs.

Table 18 Performance of soybean production technology in Jhalawar during Kharif 2018

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	13.35	25575	41385	15810	1.62
CFLDs	17.45	28850	54095	25245	1.88
% Increase	30.71	-	-	59.68	-



Soybean crop at farmer's field



Field visit by KVK scientist at farmer's field

3. Yield

- It was observed that the average yield of CFLDs was 17.45 q/ha, which was 5.10 q/ha higher than average district yield (12.35 q/ha) and 4.91 q/ha higher than state average yield (12.54 q/ha).
- Although, the average yield of CFLDs was recorded 12.55 q/ha lower as compared to potential yield (30.00 q/ha).

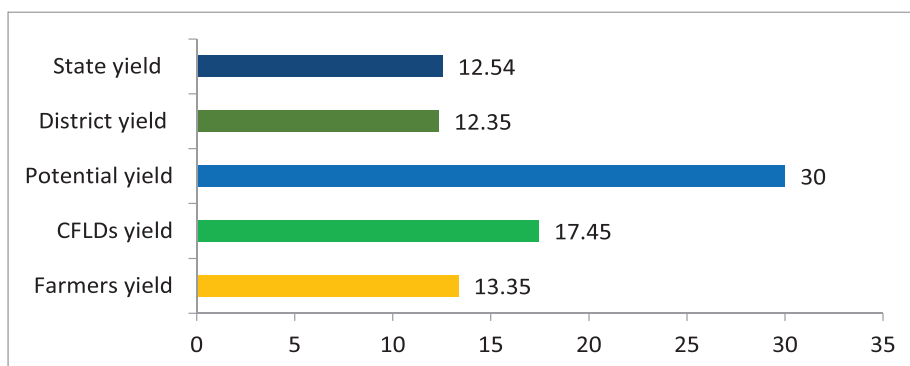


Fig. 18 Comparative average yield (q/ha) of soybean in Jhalawar district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.

5. Success Point

- Sh. Shambhu Dayal participated actively in the different programmes like; on campus training on improved production technology of soybean, field visits, field day, etc. organized by KVK Jhalawar during crop duration.
- Apart from this, he was continuously in contact with KVK scientists and he dedicatedly followed the suggested advisories timely & in proper methods at every stage of crop.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' Feedback

- JS-20-29 is matured seven days later than JS-9560 (110-115 days).
- Good Growth and development.
- No Yellow Vein Mosaic Virus infestation was reported.
- Average number of pods/plants were about 100 (85 to 115 pods/plant), while JS 95-60 was having 45 to 50 pods/plant.
- Majority of the pods having two grains per pod in JS 20-29, while JS 95-60 was having three grains/pod.
- Less or no attack of insects due to hairs on stem.

KRISHI VIGYAN KENDRA, KOTA (RAJASTHAN)

Sh. Hariom Goud S/o Sh. Giriraj Prasad

Address: Village: Chomakot, District: Kota

Mobile: 9829036256



1. Technology demonstrated

Variety: JS 20-34

Seed Rate: 75-80 kg/ha

Spacing: Sowing in 30 to 45 cm as per soil types.

Seed Treatment

- Carbendazim 50WP @ 2.0 g/kg seed and inoculation with Rhizobium culture.

Nutrient Management

- Application of 20 kg/ha N and 40 kg/ha P, Zinc sulphate @ 20-25 kg/ha.

Weed Management

- Application of Sodium Acefluorfen 16.5%+Clodinofof-P 8% EC (Readymix) @ 1000 ml/ha 20-25 DAS.

Pest Management

- Spraying of Thiacloprid 21.7 SC 750 ml/ha for Girdle beetle, Indoxacarb 14.7 SL 300 ml/ha for semilooper/tobacco caterpillar management

Disease Management

- Soil treatment with *Trichoderma viride* @ 3.0 kg/ha (mixed with 20-25 kg FYM).

2. Performance of technology

- CFLDs were conducted on soybean during Kharif-2019 at farmer's field of Kota district of Rajasthan.

- Sh. Hariom Gaur participated in KVK trainings to learn about the techniques for higher productivity of soybean crop.
- Due to improved technology of soybean, CFLDs obtained 3.78 q/ha higher yield (19.40 q/ha) than farmer's practice yield (15.62 q/ha).
- CFLD practice fetched net returns of Rs. 44772 ha⁻¹ with B:C ratio of 2.65, higher in comparison to local practice (Rs. 34700 ha⁻¹, B:C ratio 2.49).
- An additional return of Rs.10072 ha⁻¹ was obtained under demonstrated technologies.

Table 19 Performance of soybean production technology in Kota during Kharif 2019

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	15.62	23250	57950	34700	2.49
CFLDs	19.40	27202	71974	44772	2.65
% Increase	24.2	-	-	29.02	-



Field visit by KVK scientists at farmer's field

3. Yield

- It has been observed that the average yield of CFLDs was 17.45 q/ha, which was 5.10 q/ha higher than average district yield (12.35 q/ha) and 4.91 q/ha higher than state average yield (12.54 q/ha).
- Although, the average yield of CFLDs was recorded 12.55 q/ha lower as compared to potential yield (30.00 q/ha).

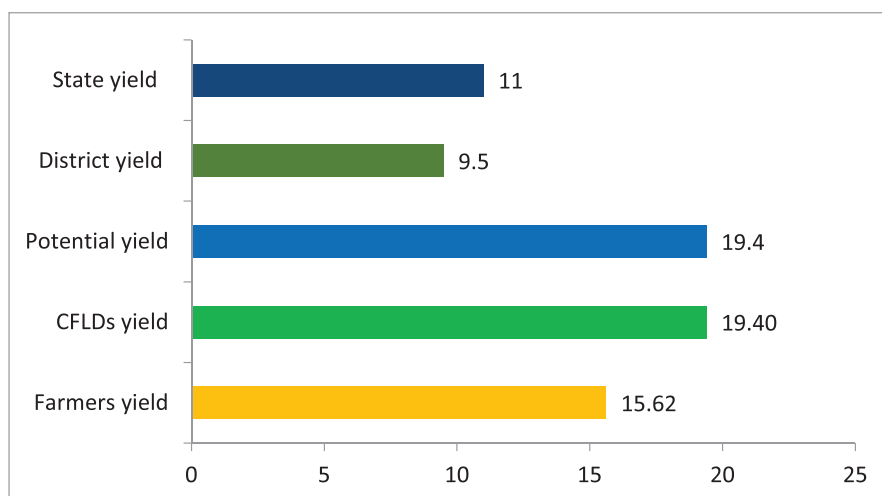


Fig. 19 Comparative average yield (q/ha) of soybean in Kota district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized workshop cum training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.
- Farmers were imported on campus training of one day before sowing of crop.
- A close supervision was maintained during crop stages/entire season by scientists of KVK.

5. Success point

- Farmer obtained better yield due to improved variety JS 20-34, as compare to local variety JS 95-60 used by him.
- Optimum seed rate & row spacing, seed treatment, proper nutrient, disease and pest management helped in increasing yield.
- Farmers of the village accepted the variety JS 20-34 and technological intervention demonstrated.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Variety JS 20-34 was accepted by the farmers for more number of pods per plant & higher yield than local.
- Seed treatment with carbendazim found effective for disease management.
- Rhizobium culture found effective & should be made available locally.
- Use of recommended NP (20:40 kg/ha) improved growth and yield of soybean.
- Weed management by the application of Sodium Acefluorfen 16.5%+Clodinofof-P 8% EC (Ready mix) was most effective.

KRISHI VIGYAN KENDRA, KUTCH-I (GUJARAT)

Sh. Dharendra Ishwarlal Pokar

Address: At & Po: Jiyapar, Taluka- Nakhtrana,
District- Kutch (Gujarat)



1. Technology demonstrated

Variety: NRCHB-101

Seed rate: 3-4 kg seed/ha

Nutrient management

- 8-10 tons of FYM with Azotobactor & Phosphorus soluble bacteria 5 kg/ha.
- 60 kg/ha N, 40 kg/ha P₂O₅ and 40 kg/ha Sulphur.

Weed management

- Spraying of pre emergence herbicide Pendimethilin 30% EC 3.30 liter/ha (1.0 liter a.i.).

Disease management

- Seed treatment with Mancozeb 2.5 g/kg seed.
- *White rust*: Seed treatment with Metalexyl 35% SD 6 g/kg seed.
- *Blight and Downy mildew*: Spraying of Metalexyl 8% + Mencozeb 64% 2g/litre ha.
- *Powdery mildew*: Dusting of Sulphur 40% powder 20 kg/ha or spray of Sulphur 80% WP 2.5 kg/ha or Dinocap 750 ml/ha.

Insect management

- *Aphids*: Spraying of Malathion 50% EC 1250 ml/ha or Thiamethoxam 25% WG 100g/ha Dimethoate 30% EC 875 ml/ha.
- *Painted Bug and Saw Fly*: Seed treatment with Imidachloprid 70% WS 7.5 gm/kg seed. Dusting of Methyl Parathion 2% powder 20 kg/ha or spray of Monocrotophos 36% WSC 1.0 litre/ha.

2. Performance of technology

- Due to proven technology of mustard, CFLDs obtained 4.50 q/ha higher yield (31.00 q/ha) than farmer's practice (26.50 q/ha).
- The farmer got Rs. 12500.00 as additional income compared to her own practices (Rs. 43000.00 per ha).

Table 20 Performance of mustard production technology in Kutch during Rabi 2016-17

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	26.50	36500	79500	43000	2.17
CFLDs	31.00	37500	93000	55500	2.48
% Increase	16.98	-	-	29.07	-



Farmers-scientists interaction on performance of variety (NRCHB-101)

3. Yield

- During Rabi 2016-17, CFLDs on mustard were laid out at farmer's field of Kutch district of Gujarat.
- The CFLDs yield was obtained 31.00 q/ha, while farmer's practice yield was recorded 26.50 q/ha. CFLDs yield was 4.5 q/ha higher than old variety.
- CFLDs yield was 14.05 and 15.25 q/ha higher than district average (16.95 q/ha) and state average yield (15.75 q/ha), respectively.
- National average yield (13.04 q/ha) was 17.96 q/ha lower than CFLDs yield.
- CFLDs yield was also higher (3.00 q/ha) compared to potential yield (28.00 q/ha) of NRCHB 101 variety.

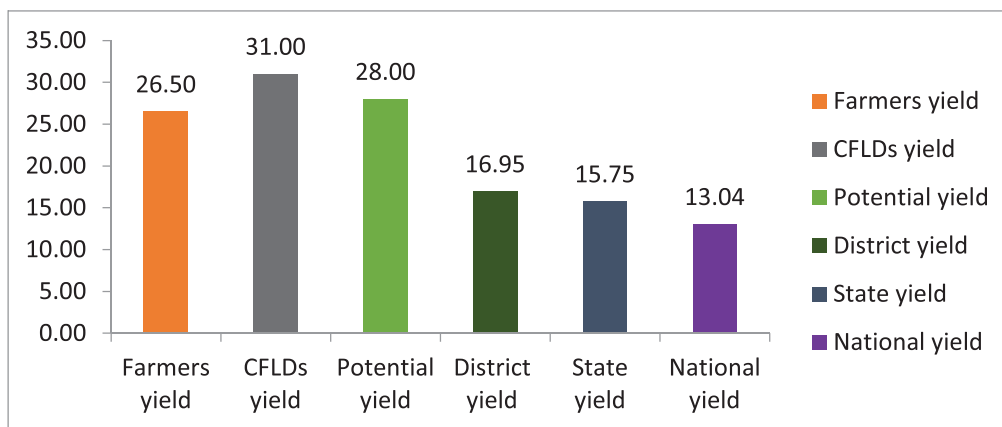


Fig. 20 Comparative average yield (q/ha) of mustard in Kutch district, Gujarat

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized workshop cum training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- KVKs imparted training before implementation of CFLDs.
- Timely field visits made by SMSs.
- Telephonic advisory/consultancy, extension activities etc. Farmers were given on campus training of two days before seed was given to partner farmers.
- A close supervision was maintained during crop stages/entire season by scientists of KVK.
- Field day was conducted on farmer's field just before harvesting of mustard and got feedback from farmers.

- Seed officers of GURABINI, Gujarat state, VLWs and other NGO workers were remained present during field day.
- Two times farmers meeting were conducted to analyze the technology gap and to get information on soil, water and other conditions.

5. Success point

- NRCHB-101 variety of Mustard is an early maturing variety. Due to early maturity, it has been observed that this variety escape from infection of Powdery Mildew (PM) disease in Gujarat condition.
- Market value of this variety also found high due to bold and dark black seeds.
- Use of Pendimethilin as pre-emergence @ 1.00 kg ai/ha reduce monocot weed infestation up to 40 days after sowing. It saved Rs. 1550/ha weeding cost as compare to local variety.
- Installation of yellow sticky trap at the time of flowering helps to monitor and to check the population of sucking pests effectively.
- Use of Sulfex 80 WP at the time of Pod formation stage helped to reduce emergence of PM disease.
- Due to use of ZnSo₄ @ 20-25 kg /ha seed weight was increased and also improved the quality of seed in respect of colour and size.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- High yield of CFLD was mainly use of well decompose organic manure applied @ 10 tone/ha. Farmers had also grown Lucerne as mix crop with mustard. It may create symbiotic effect with each other. After harvesting of Mustard, farmer left Lucerne crop for seed production with supplement irrigation.
- Short duration variety has been assessed suitable for Kutch region of Gujarat as farmers also optioned that incidence of disease was less in comparison to local/existing variety of mustard.

KRISHI VIGYAN KENDRA, KOTA (RAJASTHAN)

Sh. Ramesh Chand Suman S/o Sh. Mathura Lal Suman

Address: Village: Gandifali Tehsil; Ladpura

District: Kota

Mobile: 9829519775



1. Technology demonstrated

Variety: NRCHB-101

Seed Rate: 3-4 kg/ha

Seed Treatment

- Metalexyl 6g and Imidachloprid 48 FS 6 ml/kg seed.

Nutrient Management

- Recommended NP @80 kg and 40 kg /ha, Zinc sulphate @ 20 kg/ha.

Pest Management

- Spraying of Dimethoate 30 EC @ 1.0 litre /ha for aphid management.

Disease Management

- Soil treatment with *Trichoderma viride* @ 3.0 kg/ha (mixed with 20-25 kg FYM).

Weed Management

- Hand weeding at 20-25 DAS.

2. Performance of technology

- CFLDs were organized on mustard crop during Rabi 2016-17 at farmer's field of Kota district of Rajasthan.
- Sh. Ramesh Chand Suman participated in KVK training to acquire skills about techniques for higher productivity of mustard.
- KVK demonstrated critical inputs viz. seed variety NRCHB-101, Metalexyl and Imidachloprid for seed treatment, *Trichoderma viride*, zinc sulphate to the farmer. Improved technology of mustard under mustard CFLDs empowered to farmer to obtain 7.50 q/ha higher yield (27.5 q/ha) than farmer's practice yield (20.0 q/ha).
- CFLD practice fetched net returns of Rs 73453 ha⁻¹ with B:C ratio of 4.14, higher in comparison to local practice (Rs. 48640 ha⁻¹, B:C ratio 3.18).
- An additional return of Rs. 24813 ha⁻¹ was obtained under demonstrated technologies.

Table 21 Performance of mustard production technology in Kota during Rabi 2016-17

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	20.0	22360	71000	48640	3.18
CFLDs	27.5	23422	96875	73453	4.14
% Increase	37.5	-	-	51.01	-



KVK scientists visit at farmer's field

3. Yield

- During Rabi 2016-17, mustard CFLDs were laid out at farmer's fields. Results reveal that the CFLDs yield obtained 27.50 q/ha, while farmer's practice yield recorded was 20.00 q/ha which is 7.50 q/ha lower than CFLDs yield.
- CFLDs yield was 12.50 and 12.29 q/ha higher than district average yield (15.00 q/ha) and state average yield (15.21 q/ha), respectively.
- The national average yield (13.04 q/ha) was 14.46 q/ha lower than CFLDs yield.
- Although, CFLDs yield was approximately same as the potential yield (28.00 q/ha) of NRCHB 101 variety of mustard.

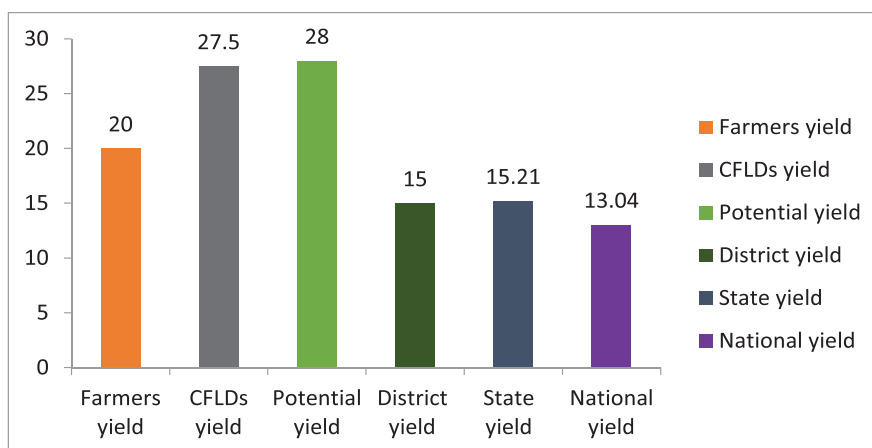


Fig. 21 Comparative average yield (q/ha) of mustard in Kota district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.
- Farmers were given on campus training of two days before seed was given to partner farmers. A close supervision was maintained during crop stages/entire season by scientists of KVK.

5. Success point

- Farmer obtained better yield due to improved hybrid variety NRCHB-101, as compare to local variety used by him.
- Optimum seed rate & row spacing, seed treatment, proper nutrient, disease and pest management helped in increasing yield.
- Farmers of the village accepted the variety NRC HB-101 and technological intervention demonstrated.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Variety NRC HB-101 was appreciated due to more number of pods/plant and higher yield.
- Use of Zinc sulphate was found to enhance grain size and more attractive.
- Seed treatment with Metalexyl & Imidachloprid found effective against white rust disease & initial attack of painted bug, respectively.



KRISHI VIGYAN KENDRA, DAUSA (RAJASTHAN)

Smt. Phula Devi Mali W/o Sh. Mohan Lal Mali

Address: Village & Post-Badagaon, Tehsil-Lawan
District-Dausa (Rajasthan)



1. Technology demonstrated

Variety: DRMRIJ 31

Seed rate: 3-4 kg seed/ha

Nutrient management

- Application of 8-10 tons of FYM with Azotobacter & Phosphorus soluble bacteria 5 kg/ha.
- 60 kg/ha N, 40 kg/ha P₂O₅ and 40 kg/ha Sulphur.

Weed management

- Spraying of pre emergence herbicide Pendimethilin 30% EC 3.30 liter/ha (1.0 liter a.i.).

Disease management

- Seed treatment with Mancozeb 2.5 g/kg seed.
- *White rust*: Seed treatment with Metalexyl 35% SD 6 g/kg seed.
- *Blight and Downy mildew*: Spraying of Metalexyl 8% + Mancozeb 64% 2g/litre ha.

Insect management

- *Aphids*: Spraying of Dimethoate 30% EC 875 ml/ha.
- *Painted Bug and Saw Fly*: Seed treatment with Imidachloprid 70% WS 7.5 gm/kg seed.
- Dusting of Methyl Parathion 2% powder 20 kg/ha.

2. Performance of technology

- CFLDs were conducted under mustard during rabi 2017-18 at farmer's field of Dausa district of Rajasthan.
- During conducting CFLDs under mustard at farmer's field improved technologies like, improved variety, optimum seed rate, recommended crop geometry, seed treatment, integrated nutrient, weed, disease and pest management were followed.
- Demonstration of Proven technology of mustard empowered farmers to obtain 9.79 q/ha higher yield under CFLDs (28.00 q/ha) than farmer's practice yield that was 18.21 q/ha.
- The farmer got Rs. 17786.00 as additional income compared to her own practices, that was Rs. 30308.00 per ha.

Table 22 Performance of mustard production technology in Dausa during Rabi 2017-18

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	18.21	39248	69556	30308	1.77
CFLDs	28.00	40002	88096	48094	2.20
% Increase	53.76	-	-	58.68	-



KVK scientists visit at farmer's field

3. Yield

- During Rabi 2017-18, mustard CFLDs were laid out at farmer's field of Dausa district of Rajasthan.
- Results reveals that the CFLDs yield obtained 28.00 q/ha, while farmer's practice yield recorded 18.21q/ha that was 9.79q/ha lower than CFLDs yield.
- CFLDs yield was 6.73 and 12.42 q/ha higher than district average yield (21.27 q/ha) and state average yield (15.58 q/ha), respectively.
- The national average yield (13.97 q/ha) was 14.03 q/ha lower than CFLDs yield.
- Although, CFLDs yield was approximately same as the potential yield (27.57 q/ha) of DRMRIJ 31 variety of mustard.

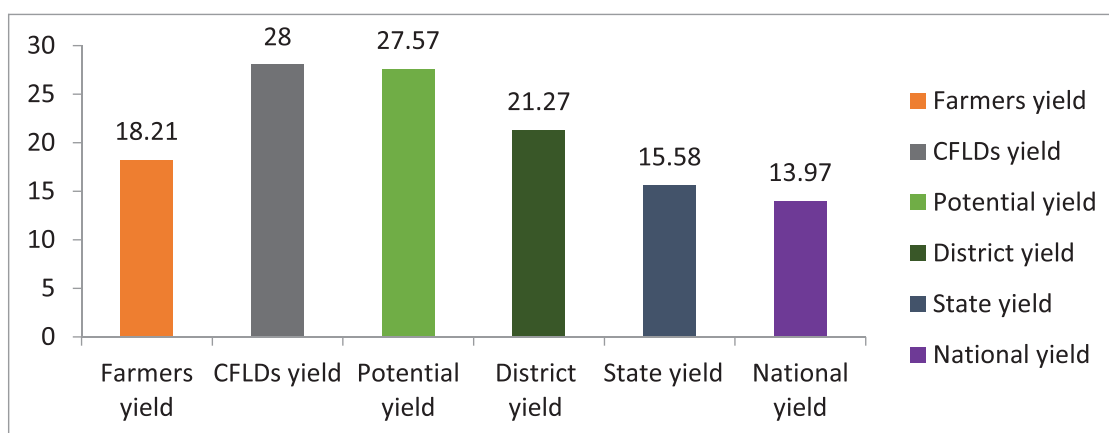


Fig. 22 Comparative average yield (q/ha) of mustard in Dausa district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.
- Farmers were imported on campus training of two days before seed was given to partner farmers.
- A close supervision was maintained during crop stages/entire season by scientists of KVK.

5. Success point

- The farmer obtained better yield due to improved variety DRMRIJ 31, as compare to local variety used by her.
- Optimum seed rate, seed treatment, integrated nutrient, weed, disease and pest management helped in increasing yield.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Variety has been appreciated for good height and production potential.
- Medium seed size.
- Mustard variety has been the accepted in area because of comparatively low incidence of diseases.
- Higher number of pods per plant along with good production potential.

KRISHI VIGYAN KENDRA, SONIPAT (HARYANA)

Sh. Randhir S/o Sh. Bharat Singh

Address: VPO: Mohana, Sonipat (Haryana)



1. Technology demonstrated

CCS HAU improved variety (RH 0749) with seed rate of 3 kg /ha, Zinc Sulphate, Biofertilizer, Dithane M-45 @ 1.25 kg/ha was demonstrated at the field of Randhir Singh, Village Mohana, Sonipat.

He managed nutrient through the recommended doses of fertilizers viz. 80 kg N, 30 kg P₂O₅, & Sulphur 25 kg per hectare.

2. Performance of technology

- CFLDs were conducted under mustard during *rabi* 2018-19 at farmer's field of Sonipat district of Haryana.
- During conducting CFLDs under mustard at farmer's field improved technologies like, improved variety, optimum seed rate, seed treatment, integrated nutrient, weed, and pest management were followed.
- Demonstration of proven technology of mustard empowered farmers to obtain 8.9 q/ha higher yield under CFLDs (25.5 q/ha) than farmer's practice yield that was 16.6 q/ha.
- The farmer got Rs. 37380.00 as additional income compared to farmer practices

Table 23 Performance of mustard production technology in Sonipat during Rabi 2017-18

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	16.6	25500	69720	44220	2.73
CFLDs	25.5	26300	107100	80800	4.07
% Increase	153.6	103.1	153.6	182.7	149.1

3. Yield

- During *rabi* 2018-19, mustard CFLDs was laid out at farmer's field of Sonipat district of Haryana.



Mustard crop at farmer's field

- Results reveal that the CFLDs yield obtained 25.5 q/ha, while farmer's practice yield recorded 16.6 q/ha that was 8.9 q/ha lower than CFLDs yield.
- CFLDs yield was 7.84 and 5.32 q/ha higher than district average yield (17.66 q/ha) and state average yield (20.18 q/ha), respectively.
- Although, CFLDs yield was 10 q/ha lower as compared to the potential yield (33.5 q/ha) of RH-0749 variety of mustard.

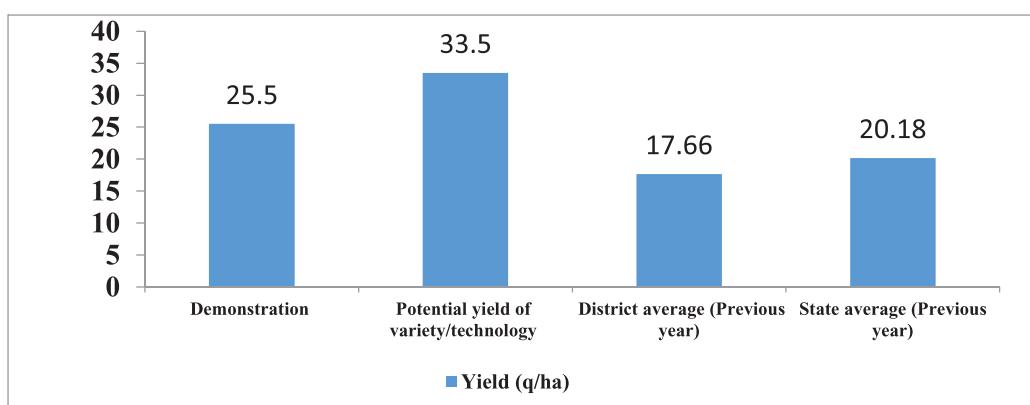


Fig. 23 Comparative average yield (q/ha) of mustard in Sonipat district, Haryana

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.
- A close supervision was maintained during crop stages/entire season by scientists of KVK.

5. Success point

- Farmer obtained better yield due to used improved variety RH-0749 as compared to local variety used by him.
- Synchronized maturity.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmer prefer variety as synchronous maturity more branching, more oil content (34-36 percent) and good yield.

KRISHI VIGYAN KENDRA, ALWAR-I (RAJASTHAN)

Sh. Daulat Ram S/o Sh. Mangal Ram Saini

Address: Village: Mohamdpur Teh: Ramgarh
District: Alwar



1. Technology demonstrated

Variety: DRMRIJ-31

Seed rate: 3-4 kg/ha

Nutrient management

- Application of 5 tons of FYM per hectare as part of the field preparation.
- Application of 40 kg N, 30 kg P₂O₅, 20 kg K₂O and 20 kg/ha Sulphur.
- After 1 month of sowing, 20 kg N per hectare also be applied as top dressing.

Weed Management

- Weeds cause approximately 20-30 percent reduction in yield.
- The most common weeds are *Chenopodium album* (bathua), *Lathyrus* spp. (chatrimatri), *Melilotus indica* (senji), *Cirsium arvense* (kateli), *Fumaria parviflora* (gajri) and *Cyperus rotundus* (motha).
- Intercultural operation with hand hoe was done after 35 day of sowing.

Disease management

- Seed treatment with Metalaxyl (Apron 35 SD) @ 6 gm/kg seed.
- *Downy Mildew*: It is caused by a fungus, *Peronospora brassicae*.
- *White Blister*: It is caused by the fungus, *Albugo candida*.
- *Control Measures*: Spraying of Redomil MZ (Metalaxyl + Mancozeb) @ 2 gm/litre of water with 500 litre per hectare after the symptoms are noticed and repeat the spray at 15 days interval.

Insect management

- *Mustard Aphid*: As the cold and cloudy weather favours the pest multiplication, spraying of crop with Dimecron 100 at the rate of 250 ml per hectare or Rogor 30 EC@1L/ha in 1000 litres of water.

2. Performance of technology

- CFLDs were conducted on mustard during Rabi 2018-19 at farmer's field of Alwar district of Rajasthan.
- During conducting CFLDs under Mustard at farmer's field Improved technologies like, improved variety, optimum seed rate, recommended crop geometry, seed treatment, integrated nutrient, weed, disease and pest management were followed.
- Demonstration of proven technology of Mustard empowered farmers to obtained 5.55 q/ha higher yield under CFLDs (30.05 q/ha) than farmer's practice yield that was 24.50 q/ha.
- The farmer got Rs. 18130.00 as additional income compared to her own practices, that was Rs. 73650.00 per ha.

Table 24 Performance of mustard production technology in Alwar during Rabi 2018-19

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	24.50	24350	98000	73650	3.02
CFLDs	30.05	28420	120200	91780	3.75
% Increase	22.65	-	-	24.62	-



Field Day Mohmmadpur village on 22/02/2019



Crop Cutting of Mustard – DRMRIJ 31

3. Yield

- During Rabi 2018-19, Mustard CFLDs was laid out at farmer's field of Alwar district of Rajasthan.
- Results reveals that the CFLDs yield obtained 30.05 q/ha, while farmer's practice yield recorded 24.50 q/ha that was 5.55 q/ha lower than CFLDs yield.
- CFLDs yield was 9.58 and 13.91q/ha higher than district average yield (20.47 q/ha) and state average yield (16.14 q/ha), respectively.
- The CFLDs yield was 2.05 q/ha higher as compared to the potential yield (28.00 q/ha) of DRMRIJ 31 variety of mustard.

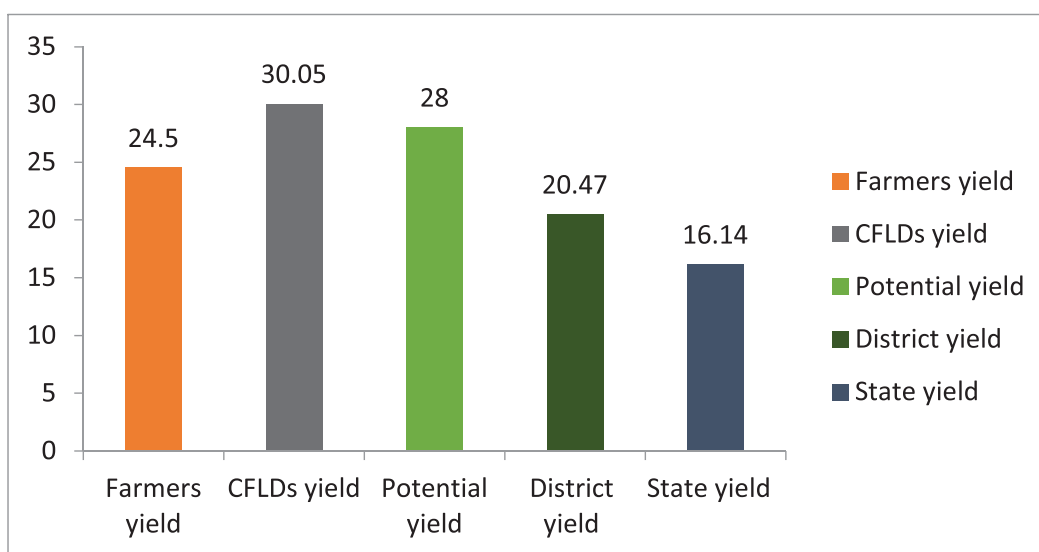


Fig. 24 Comparative average yield (q/ha) of mustard in Alwar district, Rajasthan

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.
- Farmers were imported on campus training of two days before seed was given to partner farmers.
- A close supervision was maintained during crop stages/entire season by scientists of KVK.

5. Success point

- The farmer obtained more yield due to used of improved variety DRMRIJ 31, as compare to local variety used by him.
- Optimum seed rate, seed treatment, integrated nutrient, weed, disease and pest management helped in increasing yield.
- Moderately tolerant variety against frost and major diseases.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmer prefer improved variety of Mustard.
- Mustard variety DRMRIJ 31 is moderately tolerant against major diseases and is also found suitable foe irrigated situation of Rajasthan.

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KRISHI VIGYAN KENDRA, JHAJJAR (HARYANA)

Sh. Ved Parkash S/o Sh. Neki Ram

Address: Village: Koyalpur,
District: Jhajjar



1. Technology demonstrated

Variety: RH0749

Seed rate: 3-4 kg/ha

Nutrient management

- Application of 10 tons of FYM with Bio-fertilizer (Azotobactor & Phosphorus soluble bacteria) @ 100 ml per acre mustard seed.
- Application of 60 kg/ha N, 40 kg/ha P₂O₅ and 40 kg/ha Sulphur (on soil test basis).

Weed management

- One hoeing at 25 days after sowing.

Disease management

- Seed treatment with Carbendazim 75WP@ 2 g/kg seed and 2 foliar sprays with Carbendazim 75WP @ 0.1% at 50 and 65 days after sowing for management of stem rot disease.

Insect management

- For management of mustard aphids, infested twigs were removed manually but at ETL, one foliar spray of 0.1% Dimethoate 30 EC was applied.

2. Performance of technology

- CFLDs were conducted on mustard crop during rabi 2018-19 at farmer's field of village Koyalpur district Jhajjar of Haryana.

- Various components of demonstration technologies were improved variety, seed rate, seed treatment, integrated nutrient, weed, disease and pest management.
- Demonstration of proven technology of mustard, empowered to farmer to obtain 30.3 q/ha yield then CFLDs as compared to 21.1 q/ha in farmer's practice resulting into 43.6 per cent increase in yield.
- The farmer got Rs. 29610/- as additional income compared to her own practices.

Table 25 Performance of mustard production technology in Jhajjar during Rabi 2018-19

Particulars	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	21.1	40500	88620	48120	2.18
CFLDs	30.3	49330	127260	77730	2.57
% Increase	43.6	-	-	61.53	-



KVK scientists visit at farmer's field

3. Yield

- During Rabi 2018-19, mustard CFLDs was laid out at farmer's field of Jhajjar district of Haryana.
- Results reveals that the CFLDs yield obtained 30.3 q/ha, while farmer's practice yield recorded 21.1 q/ha that was 9.2 q/ha lower than CFLDs yield.
- CFLDs yield was 8.6 and 11.4 q/ha higher than district average yield (21.7 q/ha) and state average yield (18.9 q/ha), respectively.
- The CFLDs yield was 1.5 q/ha higher as compared to the potential yield (28.8 q/ha) of RH-0749 variety of mustard.

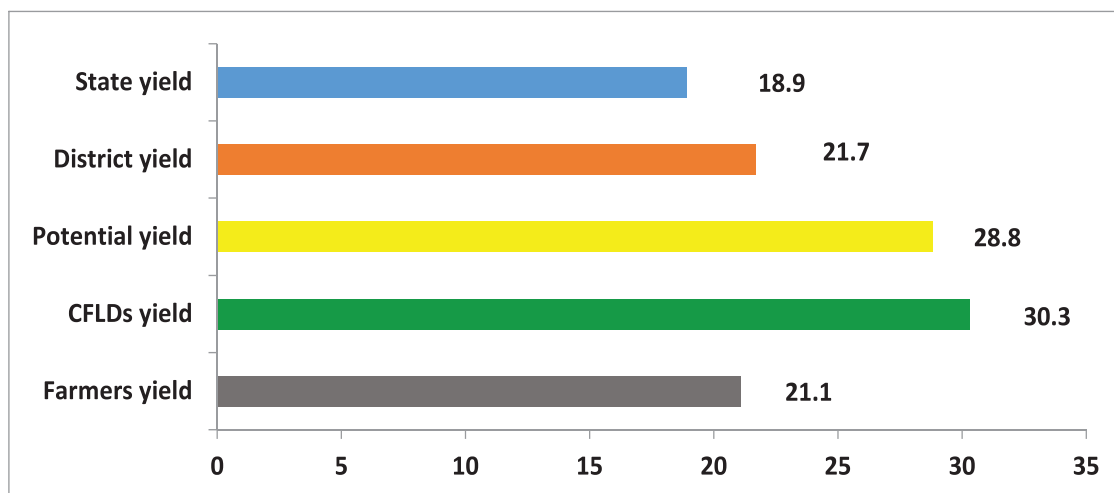


Fig. 25 Comparative average yield (q/ha) of mustard in Jhajjar district, Haryana

4. Institutional involvement

- ICAR-ATARI Zone-II, Jodhpur, organized training programs for nodal officers of all KVKs and trained them through technical session and field visits.
- Nodal officers of KVKs imparted training for farmers before implementation of CFLDs, timely field visits made by SMSs, telephonic advisory/consultancy, extension activities etc.
- Farmers were imported on campus training before of two days before seed was given to partner farmers.
- A close supervision was maintained during crop stages/entire season by scientists of KVK.

5. Success point

- The farmer obtained more yield due to improved variety RH-0749, as compared to old variety used by him.
- Timely sowing, optimum seed rate, seed treatment, integrated nutrient, weed, disease and pest management helped in increasing yield.
- All partner farmers kept factsheets during crop season and all relevant observations were filled by them. Thereby farmers have become empowered to provide feedback to scientific community and sustainability of technology packages to farmers and other extension personal.

6. Farmers' feedback

- Farmer prefers high yielding variety of mustard (RH-0749) as compared to old varieties.
- Integrated nutrient management and timely management of weeds, stem rot disease and mustard aphid were found better for increasing yield of mustard.

List of KVKs

S. No.	Name of KVKs	State (s)
1	Sabarkantha	Gujarat
2	Bikaner-I	Rajasthan
3	Bikaner-I	Rajasthan
4	Mahendergarh	Haryana
5	Bikaner-I	Rajasthan
6	Bikaner-I	Rajasthan
7	Mahendergarh	Haryana
8	Amreli	Gujarat
9	Jaipur-I	Rajasthan
10	Dholpur	Rajasthan
11	Mahendergarh	Haryana
12	Bharatpur	Rajasthan
13	Rewari	Haryana
14	Jaipur-I	Rajasthan
15	Mahendergarh	Haryana
16	Jhalawar	Rajasthan
17	Jhalawar	Rajasthan
18	Jhalawar	Rajasthan
19	Kota	Rajasthan
20	Kutch-I	Gujarat
21	Kota	Rajasthan
22	Dausa	Rajasthan
23	Sonipat	Haryana
24	Alwar-I	Rajasthan
25	Jhajjar	Haryana



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"ONE STOP SHOP FOR FARMERS"

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