

# Performance of Cluster Frontline Demonstrations on Oilseeds in Rajasthan and Gujarat



**ICAR-Agricultural Technology Application Research Institute**

Zone-II, Jodhpur-342 005, Rajasthan, India

(ISO 9001-2015 Certified Institute)

# **Performance of Cluster Frontline Demonstrations on Oilseeds in Rajasthan and Gujarat**

*Edited and Compiled by:*

**Dr. M.S. Meena**

**Dr. R.B. Kale**

**Dr. S.K. Singh**

**Dr. P.P. Rohilla**

**2017**



**ICAR-Agricultural Technology Application Research Institute**

**Jodhpur-342 005, Rajasthan, India**

**(ISO 9001-2015 Certified Institute)**

**Published by**

Dr. S.K. Singh  
Director

**Edited and Compiled by**

Dr. M.S. Meena  
Dr. R.B. Kale  
Dr. S.K. Singh  
Dr. P.P. Rohilla

**Project Staff**

Sh. Prabhat Singh  
Sh. Abhishek Paldiya  
Sh. Bhawani Singh Inda

**Technical Assistance**

Sh. P.K. Satapathy

**Citation**

Meena, M.S, Kale, R.B., Singh, S.K. and Rohilla, P.P. (2017). Performance of Cluster Frontline Demonstrations on Oilseeds in Rajasthan and Gujarat. Published by ICAR-Agricultural Technology Application Research Institute, Jodhpur, Technical Report, 8/2017: Page No. 1-36

**Acknowledgments**

We are thankful to Dr. A.K. Singh, Hon'ble DDG (Agricultural Extension) for providing all the support and guidance for efficient implementation of Cluster Front Line Demonstrations on Oilseeds under National Mission on Oilseeds and Oil Palm.

**Printed at**

Evergreen Printers, Jodhpur # 9414128647

---

This technical bulletin is an output of the project Cluster Frontline Demonstration on Oilseeds under National Mission on Oilseeds and Oilpalm (Project code: AYG00167)



**Dr. S.K. Singh**  
Director



## **ICAR-Agricultural Technology Application Research Institute**

**(CAZRI Campus), Jodhpur-342 005, Rajasthan, India**

**(ISO 9001-2015 Certified Institute)**

### **MESSAGE**


India is one of the major oilseeds growers and importers of edible oils. India's vegetable oil economy is world's fourth largest after USA, China & Brazil. The diverse agro-ecological conditions in the country are favourable for growing nine annual oilseed crops, which include seven edible oilseeds (groundnut, rapeseed & mustard, soybean, sunflower, sesame, safflower and niger) and two non-edible oilseeds (castor and linseed). Oilseeds cultivation is undertaken across the country in about 27 million hectares mainly on marginal lands, of which 72% is confined to rainfed farming. Therefore, concerted efforts are urgently needed for dissemination of technologies & innovative approaches. Participatory mode is to be strengthened for effective delivery mechanism by show-casing the potential technologies/products related to potential oilseed crops.

Government of India is striving to increase oilseed production. In the same direction, ICAR has taken initiative to augment oilseed production and productivity in country by conducting nationwide cluster frontline demonstrations through Krishi Vigyan Kendra across the country. ICAR has activated a collaborative project "Cluster Frontline Demonstration on Oilseeds" since 2015-16 under National Mission on Oilseed and Oil palm (NMOOP) with financial assistance of Department of Agriculture, Cooperation & Farmers Welfare, GOI, New Delhi. Wherein, KVKs are hand holding out farmers with quality seeds and proven technological packages. This initiative lays emphasis on major oilseed crops, namely mustard, sesame, soybean and groundnut. Results of CFLDs have been encouraging compared to the existing practices. This gives us hope to break yield plateau resulting in production of sufficient quantity of oilseed to meet per capita availability of oilseed for ensuring nutritional security and agro-ecological sustainability.

I complement the scientists of ICAR-Agricultural Technology Application Research Institute, Jodhpur for implementing the scheme, monitoring and coordinating with different stakeholders involved in the oilseeds production.

I am also thankful to Directors of Extension Education from various State Agricultural Universities and Senior Scientist and Head/Nodal Officers of KVKs for implementing National Mission on Oilseed and Oil palm scheme in right spirit for enhancing oilseed production in Rajasthan and Gujarat states. I am sure that much efforts will be done in future by KVKs of this zone to achieve self-sufficiency in oilseeds in the country.

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



**(S.K. Singh)**



# CONTENTS

S.No.	Particulars	Page No.
	<i>Message</i>	
	<i>Executive Summary</i>	i
<b>1.</b>	<b>Introduction</b>	<b>1-6</b>
	1.1 Government initiatives on edible oilseeds and oils	3
	1.2 Status of oilseeds production in Rajasthan	5
	1.3 Status of oilseeds production in Gujarat	6
<b>2.</b>	<b>Technologies Demonstrated during CFLDs on Oilseeds</b>	<b>6-7</b>
<b>3.</b>	<b>CFLDs on Oilseeds implemented by KVKs of Rajasthan and Gujarat</b>	<b>8</b>
<b>4.</b>	<b>Performance of CFLDs during Kharif 2016-17</b>	<b>8-13</b>
	4.1 Performance of CFLDs on Sesame in Rajasthan	8
	4.2 Performance of CFLDs on Soybean in Rajasthan	10
	4.3 Performance of CFLDs on Groundnut in Rajasthan	11
	4.4 Performance of CFLDs on Groundnut in Gujarat	12
	4.5 Performance of CFLDs on Sesame in Gujarat	12
	4.6 Performance of CFLDs on Soybean in Gujarat	13
<b>5.</b>	<b>Performance of CFLDs during Rabi 2016-17</b>	<b>14-16</b>
	5.1 Performance of CFLDs on Mustard in Rajasthan	14
	5.2 Performance of CFLDs on Mustard in Gujarat	16
<b>6.</b>	<b>Performance of CFLDs during Summer 2017-18</b>	<b>17-18</b>
	6.1 Performance of CFLDs on Groundnut in Gujarat	17
	6.2 Performance of CFLDs on Sesame in Gujarat	18

<b>7.</b>	<b>Scenario &amp; Disposal Pattern of Oilseeds in Rajasthan &amp; Gujarat</b>	<b>19-23</b>
	7.1 Scenario and Disposal Pattern of Seeds of Oilseed in Rajasthan	19
	7.1.1 Scenario and disposal pattern of Mustard production	19
	7.1.2 Scenario and disposal pattern of Groundnut production	20
	7.1.3 Scenario and disposal pattern of Sesame production	21
	7.1.4 Scenario and disposal pattern of Soybean production	21
	7.1.5 Scenario and disposal pattern of Sesame production	21
	7.1.6 Scenario and disposal pattern of Groundnut production	22
	7.2 Scenario and Disposal Pattern of Seeds of Oilseed Crops in Gujarat	22
	7.2.1 Scenario and disposal pattern of Soybean production	22
	7.2.2 Scenario and disposal pattern of Sesame production	22
	7.2.3 Scenario and disposal pattern of Groundnut production	23
<b>8.</b>	<b>Follow up Package of Technology Demonstrated during 2015-16</b>	<b>23-24</b>
	8.1 Follow up of package technology of Mustard and Groundnut	23
	8.2 Follow up of package technology of Sesame and Groundnut	24
<b>9.</b>	<b>Training and Monitoring</b>	<b>24-26</b>
	9.1 Training programmes	24
	9.2 Monitoring of CFLDs	26
<b>10.</b>	<b>Success Story on Oilseeds Production Technology</b>	<b>27-36</b>
	10.1. Success Story of Kharif	27
	10.2 Success Story of Rabi	33



## **Executive Summary**

Edible oil forms an integral part of our daily diet. India is one of the largest producers of vegetable oil in the world. In the agricultural economy of India, oilseeds are important next only to food grains in terms of hectare, production and value. Oilseeds are grown on nearly 14 per cent of the gross cropped area in the country i.e. 26.09 million ha. with production of 25.25 million tonnes during 2015-16. However, domestic consumption of edible oils in India has increased substantially over the years. The demand of edible oils in India is 23.49 million tonnes against domestic availability of 8.64 million tonnes during 2015-16. The gap between production and consumption is being met through huge imports. According to planning commission, the projected production edible oilseeds in 2021-22 is 46.00 million tonnes against the 34.00 million tonnes projected supply based on the current growth rate. To reduce this gap in demand and supply, ICAR in collaboration with Department of Agriculture, Cooperation & Farmers Welfare, GOI, New Delhi under National Mission on Oilseed and Oil Palm (NMOOP) has taken initiative to augment oilseed production and productivity in the country by conducting nationwide Cluster Frontline Demonstrations (CFLDs) through 669 Krishi Vigyan Kendra across the country.

Under, ICAR-Agricultural Technology Application Research Institute, Jodhpur, 51 KVKs including Rajasthan and Gujarat were involved to demonstrate best practices and proven technological packages of Oilseeds for increasing productivity and profitability during Rabi 2015. The results of CFLDs have been encouraging compared to existing practices. The CFLDs on Oilseeds Production Technology were implemented through a network of KVKs since October 2015. Total 51 KVKs including 33 KVKs from Rajasthan & 18 KVKs from Gujarat states are actively involved in conductance of CFLDs. During Kharif 2016, a total of 2263 CFLDs on oilseeds were laid out in the 911.4 ha area against the sanctioned 2292 CFLDs in 916.6 ha area under different micro-farming situations of selected districts. Out of 2263 planned CFLDs, 1201 CFLDs were conducted in 483.40 ha areas in Rajasthan while 1062 demonstrations were laid out in 428.00 ha area by KVKs of Gujarat. During Rabi 2016-17, a total of 2050 CFLDs on Mustard were laid out in the 800.00 ha. Out of 2050 planned demonstrations, 1600 CFLDs were conducted in 640.00 ha areas in Rajasthan while 450 demonstrations were laid out in 160.00 ha by KVKs of Gujarat. During summer 2017, CFLDs on groundnut and sesame were conducted at farmers' fields. An area of 168.00 ha was covered under groundnut while 196.00 ha area were under the sesame in Gujarat state.



In Rajasthan state, during kharif 2016 the performance of sesame was highest in Churu-I district where productivity under CFLDs was 9.13 q/ha. The productivity of soybean was highest in Sub-Humid Southern Plain & Aravali Hill zone (IV A) where the yield under CFLDs was 12.04 q/ha. The productivity of groundnut was highest in Hyper Arid Partial Irrigated zone (36.70 q/ha) in Rajasthan. In Gujarat state, yield of Sesame was highest in North Saurashtra (8.17 q/ha). Productivity of Soybean was highest in Middle Gujarat zone (17.04 q/ha). The productivity of Groundnut was highest in Kutch district (27.51 q/ha). During Rabi 2016-17, the yield of Mustard was highest in flood prone eastern plain zone (Semi-arid) where the (22.33 q/ha) in Rajasthan while the yield of Mustard was highest in North Gujarat zone (17.32 q/ha). During Summer 2017, the yield of Groundnut was highest in Amreli district (21.97 q/ha) and productivity of Sesame was highest in North Saurashtra (12.11 q/ha) of Gujarat.

Looking the importance of quality seeds, KVKs have initiated to mobilize selected farmers of CFLDs for promotion of informal seed system to ensure availability of quality seeds of farmers preferred variety(s) at village level. Farmers have been motivated to keep at least 25 to 30% produce of CFLDs as seed for large scale multiplication and farmers to farmers' diffusion. Majority of farmers have followed and kept seeds of Mustard, Groundnut, Sesame and Soybean were used during Rabi 2016-17 and Summer 2017 under different oilseed crops for use in next season.

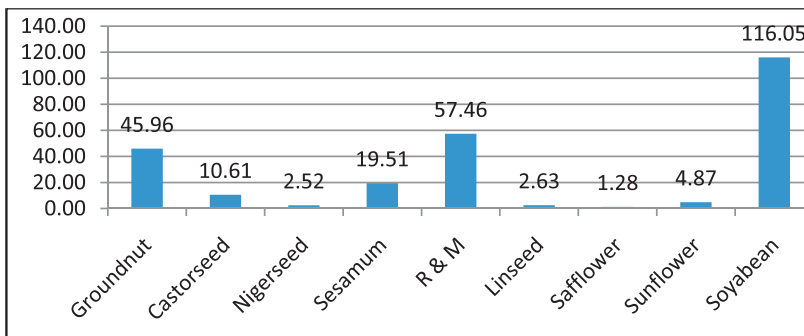
ICAR-ATARI, Jodhpur has organized 5 two-days training programme for Nodal Officers of KVKs under NMOOP during 2016-17 to acquaint them with package of practices of major oilseed crops being demonstrated in cluster mode.



## **1. Introduction**

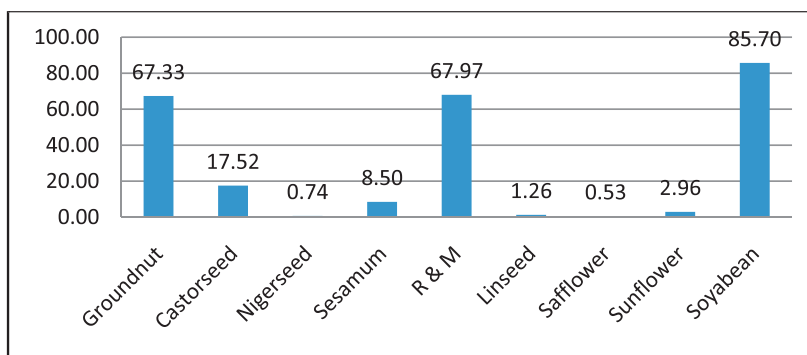
India is one of the largest vegetable oil economies in the world. India occupies a prominent position in both area and production. Currently, India accounts for about 12-15% of world's oilseeds area, 7-8% of world's oilseeds output and 9-10% of world's edible oils consumption. In the agricultural economy of India, oilseeds are important next only to food grains in terms of hectare, production and value. Oilseeds production assumes great importance in India because of the gap in demand and supply, which forced our country to import vegetable oils. Unfortunately, the gap is continually widening, causing a heavy drain in the foreign exchange reserves of the Country. Oilseeds are grown on nearly 14% of the gross cropped area in the country i.e. 26.09 million ha. with production of 25.25 million tonnes during 2015-16. However, domestic consumption of edible oils in India has increased substantially over the years owing to rising income levels, increase in population and improvement of living standards. The demand of edible oils in India is 23.49 million tonnes against the domestic availability of 8.64 million tonnes during 2015-16. The gap between production and consumption is being met through huge imports. According to planning commission, the projected production demand for oilseeds in 2021-22 is 46.00 million tonnes against the 34.00 million tonnes projected supply based on the current growth rate. In India, 9 oilseeds namely groundnut, soybean, rapeseed-mustard, sesame, sunflower, safflower, niger, castor and linseed are the major source of vegetable oil and contributes more than 70% of domestic availability of vegetable oils. Oil palm, coconut, cotton seed, rice bran, tree borne oilseeds and solvent extracted oil are the secondary source of vegetable oils that contributes about 30% of total domestic availability of vegetable oils. Among 09 oilseeds soybean (39%), groundnut (24%) and rapeseed-mustard (24%) contribute more than 87% of total oilseeds production in the country. However, in terms of vegetable oil production mustard, soybean and groundnut contribute more than 31%, 26% and 25%, respectively.

In the country, Soybean is the most important crop with an estimated production of 8.59 million tonnes in 2015-16 grown mainly in Madhya Pradesh, Maharashtra, and Rajasthan accounting for around 95% of total production. The second most important oilseed crop is rapeseed-mustard (6.82 million tonnes) mainly grown in Rajasthan, Madhya Pradesh, Haryana, Uttar Pradesh, West Bengal and Gujarat with an estimated share of about 93% in total production in the country. Groundnut is third important oilseed crop production of 6.77 million tonnes in 2015-16 and grown in Gujarat, Andhra Pradesh, Tamil Nadu, Rajasthan, Karnataka and Maharashtra with a combined share of about 91% in total groundnut production in the country. Madhya Pradesh (24.68%), Rajasthan (22.57 %) and Gujarat (16.21%) are the major oilseeds producing states in the country. Oilseeds production assumes significant importance in India because of the gap in demand and supply which force our country to import vegetable oil.



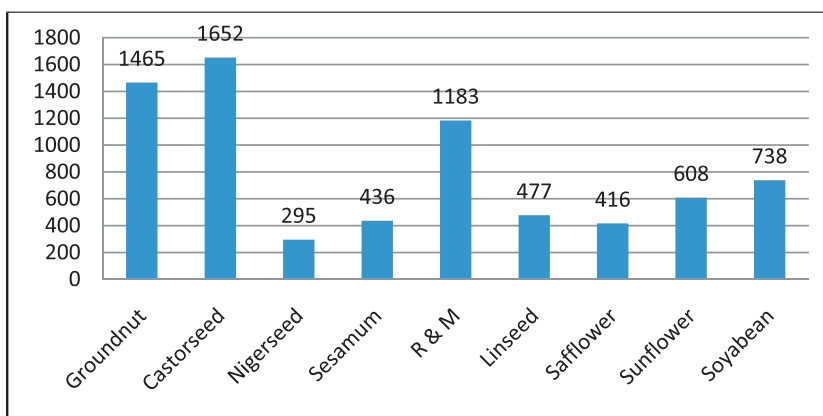
**Fig.1.1 Area under Oilseeds in India during 2015-16 (in Lakh ha.)**

Source: Agricultural Statistics 2016, Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, GOI, New Delhi.



**Fig.1.2 Production of Oilseeds in India during 2015-16 (in Lakh Tonnes)**

Source: Agricultural Statistics 2016, Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, GOI, New Delhi.



**Fig.1.3 Productivity of Oilseeds in India during 2015-16 (in Kg/ha.)**

Source: Agricultural Statistics 2016, Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, GOI, New Delhi.

### 1.1 Government initiatives on Edible Oilseeds and Oils

During the 1980s, despite having world's second largest area under oilseeds, edible oils is the largest import item of India constituting about 30 per cent of the total imports. Therefore, to achieve self-sufficiency in edible oilseeds through various policy and technological interventions National Oilseed Development Project (NODP) was initiated in 1984-85 and launched in 1985-86 by reorienting various centrally sponsored schemes for oilseeds development. Technology Mission on Oilseeds was started in May 1986 by Government of India to increase oilseeds production in the country. In 1991-92, in view of the potential of oil palm in the country, Oil Palm Development Programme (OPDP) was launched under the “Technology Mission on Oilseeds and Pulses”. Subsequently, during the Tenth Plan, Integrated Scheme on Oilseeds, Pulses, Oil Palm and Maize (ISOPOM) was implemented by converging earlier schemes like Oilseeds Production Programme (OPP), Oil Palm Development Programme (OPDP), National Pulses Development Programme (NPDP) and Accelerated Maize Development Programme (AMDP). From April 2010, pulses component of ISOPOM has been merged with National Food Security Mission (NFSM) to intensify efforts for production of pulses. A special initiative was undertaken under RKVY for implementation of a Special Programme on Oil Palm Area Expansion (OPAE) to augment the production of palm oil by 2.5 to 3.00 lakh tonnes by 2015. Every year Government of India is fixing Minimum Support Price (MSP) to protect the producer- farmers-against excessive fall in price during bumper production years. Minimum Support price of oilseeds fixed by the government during last five years is given in Table below.

**Table 1.1 Minimum Support Price of oilseeds from 2012-13 to 2016-17 (Rs/q).**

Crop	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Groundnut	3700	4000	4000	4030	4220*	4450**
Sunflower	3700	3700	3750	3800	3950*	4100*
Soybean (Black)	2200	2500	2500	-	2775*	3050**
Soybean (Yellow)	-	2560	2560	2600	2775*	3050**
Sesame	4200	4500	4600	4700	5000**	5300*
Niger	3500	3500	3600	3650	3825*	4050*
Rapeseed-Mustard	3000	3050	3100	3350	3700*	-
Safflower	2800	3000	3050	3300	3700*	-

Source: Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, GOI, New Delhi.

## National Mission on Oilseeds and Oil Palm (NMOOP)

NMOOP was launched in April, 2014 keeping in view achievements of the erstwhile schemes namely, Integrated Scheme of Oilseeds, Oil Palm and Maize (ISOPOM), Tree Born Oilseeds (TBOs) and Oil Palm Area Expansion (OPAE) programme during the 11th Plan period. These schemes had a positive impact on production and productivity of oilseeds and area expansion under Oil Palm. NMOOP comprising 3 Mini Missions (MM), one each for Oilseeds (MM-I), Oil Palm (MM-II) and Tree Borne Oilseeds -TBOs (MM-III) was launched from April, 2014.

### Objectives:

1. To increase production and productivity of oilseeds crops under different agro-ecological situations.
2. To pilot innovations and improved efficiency within the overall objective of the Scheme and its expected outcomes
3. To undertake mitigation/restoration activities in case of natural calamities in the oilseeds sector.

**Mission Targets:** The Mission aims to enhance production of oilseeds from 28.93 million tonnes (average of XI Plan) to 35.51 million tonnes by 2016-17 and to bring additional area of 1.25 lakh ha under oil palm cultivation with increase in productivity of FFBs from 4927 kg/ha to 15000 kg/ha by end of XII Plan.

**Strategies:** In order to increase the production and productivity of oilseeds, emphasis has been given on increasing the Seed Replacement Ratio (SRR) with focus on Varietal Replacement; increasing irrigation coverage under oilseeds; diversification of area from low yielding cereals to oilseeds; inter-cropping of oilseeds with cereals/ pulses/ sugarcane; use of rice fallows; expansion of cultivation of oil palm & TBOs in watersheds and wastelands; increasing availability of quality planting materials of oil palm & TBOs; enhancing procurement of oilseeds and collection & processing of TBOs. Inter-cropping during gestation period of oil palm and TBOs would provide economic return to the farmers when there is no production.

**Funding Pattern:** Cost of interventions under the Mission was in the ratio of 75:25 during 2014-15 which was changed to 50:50 and has been restructured to 60:40 between Centre and States. However, for some components like seed production, FLDs, minikits and adaptive research being implemented through central agencies/SAUs/ICAR institutes 100% central support is provided. The funds are released to the State Departments of Agriculture/ Horticulture through State treasuries.

**Area of Operation:** The Mini Mission wise coverage is given as under:

**Mini Mission-I:** Andhra Pradesh, Assam, Arunachal Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Jammu & Kashmir, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttar Pradesh, Uttarakhand and West Bengal.

**Mini Mission-II:** Andhra Pradesh, Assam, Ar. Pradesh, Bihar, Chhattisgarh, Goa, Gujarat, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Karnataka, Kerala, Odisha, Sikkim, Tamil Nadu, Telangana, Tripura and West Bengal.

**Mini Mission-III:** Andhra Pradesh, Assam, Arunachal Pradesh, Bihar, Chhattisgarh, Gujarat, Goa, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttar Pradesh, Uttarakhand and West Bengal.

**Central Agencies:** In addition to the above-mentioned States, Central Agencies like NSC, IFFCO, KRIBHCO, NAFED, HIL, SFAC and institutions of ICAR including SAUs and ICRISAT are also involved in production and distribution of seed including seed minikilts, FLDs and R&D activities.

As a result of these policy and technological interventions initiatives during last 25 years, the production of oilseeds increased significantly from 20.1 million tonnes in 1992-92 to over 33 million tonnes during 2016-17 (II estimate), largely due to improved yields. Average yields increased from 797 kg/ha to 1261 kg/ha during the corresponding period. Increase in area also contributed to higher production of oilseeds in the country.

### 1.2 Status of oilseeds production in Rajasthan

Rajasthan is second largest producer of oilseeds after Madhya Pradesh contributing 22.57 % of oilseed production of the country. Rapeseed-mustard (58.33%), soybean (22.28%), groundnut (8.83%), sesame (6.82%) and castor (3.69%) are the major oilseeds grown in the state. Rajasthan is the largest producer of rapeseed-mustard, second largest producer of sesame and third largest producer of soybean in India. The area, production and productivity of major oilseeds crops during 2015-16 in Rajasthan is given below.

**Table 1.2.1 Area, production and productivity of oilseeds crops in Rajasthan during 2015-16**

Kharif	Area (lakh ha)	Production (lakh tonnes)	Productivity (kg/ha)
Soybean	12.04	8.04	667
Groundnut	5.20	10.55	2028
Sesame	3.66	1.15	314
Castor	1.91	2.69	1410
Mustard	25.32	32.6	1288
Linseed	0.01	0.01	1013
	<b>24.90</b>	<b>55.04</b>	<b>1120</b>

Source: Rajasthan Krishi (2015-16)

### 1.3 Status of oilseeds production in Gujarat

Gujarat is third largest producer of oilseeds contributing 16.21% of oilseed production of the country. The state ranks first position in the production of groundnut in India. The area and production of groundnut in the state was highest with 14.14 lakh ha and 20.42 lakh tonnes, respectively during 2015-16. Castor seed and sesame are other major oilseeds produces in the state. The state also ranks first position in area, production and yield of castor.) and production (12.9 lakh tonne) of castor in Gujarat produced 13.13 lakh tonnes castor over 7.02 lakh ha area with 1870 Kg/ha yield. The area, production and productivity of major oilseeds crops during 2015-16 in Gujarat is given below.

**Table 1.3.1 Area, production and productivity of oilseeds crops in Gujarat during 2015-16.**

Crop	Area (lakh ha)	Production (lakh tonnes)	Productivity (kg/ha)
Groundnut	14.14	20.42	1444
Castor seed	7.02	13.13	1870
Sesame	1.66	0.67	403
Rapeseed & Mustard	1.90	3.06	1612
Niger Seed	0.06	0.03	550
Sunflower	0.004	0.004	1100
Soybean	0.80	0.54	675
Total	25.59	37.86	1479

Source: Directorate of Agriculture, Gujarat 2015-16.

## 2. Technologies demonstrated during CFLDs on Oilseeds

The usable technologies of groundnut, sesame, soybean and rapeseed and mustard demonstrated during 2016-17 at farmers filed are depicted in table 2.1 and 2.2.

**Table 2.1 Technology of groundnut, sesame and Soybean demonstrated during Kharif 2016-17.**

Crops	Varieties	Seed treatment	Weed Management	Fertilizer Management	Insect pest and Disease
Groundnut	TG-37 A, HGN-10, GG-20, RG-425	Thiram or Mancozeb (3g/kg of kernel or Carbendazim (2g/kg)	Alachlor or Fluchloralin @ 1.5 a.i./ ha (Pre-sowing), Pendimethalin @ 1 kg a.i./ha (pre-emergence)	N: P: K, 40:40:60 kg/ha as basal, Apply Borax @ 10 Kg/ha as basal, Gypsum @ 200 Kg/ha at pegging stage	<b>Insect:</b> White grub, Leaf miner and Aphid Disease: Early leaf spot, tikka and collar rot

Crops	Varieties	Seed treatment	Weed Management	Fertilizer Management	Insect pest and Disease
Sesame	RT-153, RT-351, RT-346, T-3	Thiram or Mancozeb (2.5g/kg seed)	Basalin @ 1 kg a.i./ha or pendimethalin @ 1 kg/ha as pre-emergence treatment	N: P: K 20:10:10 (rainfed) Manganese sulphate @ 5 Kg/ha as basal	<b>Insect:</b> Leaf roller, Gall fly and Hairy caterpillar. <b>Diseases:</b> Bacterial blight, cercospora leaf spot & powdery mildew
Soybean	RKS-45, JS-335, JS 95/60	Thiram or Mancozeb (3g/kg seed or Carbendazim (2g/kg)	Pre-plant Incorporation fluchloralin @ 1.0 kg/ha, pre-emergence application of alchlor @ 2 kg/ha	N: P: K, 20:80:20 kg/ha 20 Kg/ha Sulphur	<b>Insect:</b> Hairy caterpillar, Girdle Beetle, white fly. <b>Diseases:</b> Bacterial blight, yellow mosaic and Alternaria leaf spot

**Table 2.2 Technology of Rapeseed and Mustard demonstrated during Rabi 2016-17**

Crops	Varieties	Seed treatment	Weed Management	Fertilizer Management	Insect pest & Disease
Rapeseed and Mustard	RH-749, RGN-229, NRCDR-2, NRCHB-101 PM-26	Thiram or Mancozeb (3g/kg seed or Carbendazim (2g/kg)	For Orobanche management spray the soil with 0.25% copper sulphate (Drenching), Pre-plant Incorporation fluchloralin @ 1.25 kg/ha	N: P: K: 60:40:40 kg/ha (irrigated) 40:20:20 kg/ha (un irrigated), 20-25 kg/ha Sulphur	Aphid is major insect. Alternaria blight, white rust, downy mildew are major diseases



### 3. CFLDs on Oilseeds implemented by KVKs of Rajasthan and Gujarat

During 2016-17, total of 2263 CFLDs on oilseeds were laid out in the 911.4 ha area. Out of 2263 planned demonstrations, 1201 CFLDs were conducted in 483.40 ha areas in Rajasthan while 1062 demonstrations were laid out in 428.00 ha area in Gujarat. The CFLDs detail is given in table-3.1.1.

**Table 3.1.1 CFLDs on Oilseeds implemented during Kharif 2016-17**

Sl. No.	State	Crop	Sanctioned		Implemented	
			Demo	Area (ha)	Demo	Area (ha)
1.	Rajasthan	Groundnut	234	93.60	234	93.60
		Soybean	408	163.00	430	163.00
		Sesame	550	220.00	537	226.80
		<b>Sub-Total</b>	<b>1192</b>	<b>476.60</b>	<b>1201</b>	<b>483.40</b>
2.	Gujarat	Groundnut	600	240.00	582	232.00
		Soybean	250	100.00	274	100.00
		Sesame	250	100.00	206	96.00
		<b>Sub-Total</b>	<b>1100</b>	<b>440.00</b>	<b>1062</b>	<b>428.00</b>
		<b>Total</b>	<b>2292</b>	<b>916.60</b>	<b>2263</b>	<b>911.40</b>

### 4. Performance of Cluster Frontline Demonstrations during Kharif 2016-17

#### 4.1 Performance of Sesame CFLDs in State - Rajasthan

During Kharif 2016-17, 537 CFLDs of Sesame on full packages were demonstrated in 226.8 ha area by KVK Jodhpur-I, Churu-I, Jalore, Pali, Sirohi, Jaipur-I, Tonk, Bharatpur, Karauli, Dholpur, Sawai Madhopur, and Rajsamand in Rajasthan. The performance of sesame was highest in Churu-I district where productivity under CFLDs was 9.13 q/ha.

**Table 4.1.1 Performance of Sesame demonstration conducted during Kharif 2016-17**

Agro Climatic Zone/Climate	KVKs	Variety Demonstrated	Dist. Avg. (q/ha)	Area (in ha)	No. of Demo	Yield (q/ha)		% increase	Net Return (Rs./ha)		BCR	
						Check	Demo		Check	Demo	Check	Demo
I a- Arid western plains zone (Arid)	Jodhpur-I	RT-351, RT-346	4.11	10.00	25	3.08	8.28	168.83	13300.00	33380.00	2.61	2.94
I c- Hyper arid and partially irrigated western plain zone (Arid)	Churu-I	RT-351	4.37	20.00	50	6.19	9.13	47.50	25196.00	41055.00	2.89	3.76
II b- Transitional plain of Luni basin zone (Semi-arid)	Jalore Pali Sirohi	RT-351	4.44	20.00	40	6.5	8.39	29.07	26250.00	36536.00	2.64	3.02
			3.40	20.00	40	2.5	4.3	72.00	24400.00	33900.00	1.9	4.4
			2.60	20.00	50	3.00	5.42	80.00	6200.00	11100.00	1.4	1.69
	<b>Total</b>		<b>60.00</b>	<b>130</b>	<b>7.09</b>	<b>6.03</b>	<b>79.48</b>	<b>18950.00</b>	<b>27178.00</b>	<b>1.98</b>	<b>3.03</b>	
III a- Semi arid eastern plain zone (Semi-arid)	Jaipur-I Tonk	RT-351	2.63	26.80	67	4.86	7.07	45.47	15194.00	27865.00	1.81	2.29
			1.92	20.00	50	5.70	7.30	28.07	29550.00	39250.00	2.2	2.53
<b>Total</b>			<b>46.80</b>	<b>117</b>	<b>5.28</b>	<b>7.28</b>	<b>36.77</b>	<b>18653.00</b>	<b>31290.00</b>	<b>1.91</b>	<b>2.39</b>	
III b- Flood prone eastern plain zone (Semi- arid)	Bharatpur Karauli Dholpur Sawai Madhopur	RT-351	3.40	20.00	50	3.96	4.5	27.11	3948.00	8400.00	1.2	1.4
			5.27	20.00	50	5.8	6.5	12.06	29700.00	34000.00	1.2	1.3
			5.71	20.00	50	6.0	7.5	25.00	13000.00	24650.00	..	..
			4.97	20.00	40	4.62	6.12	32.46	14900.00	24294.00	0.99	1.56
<b>Total</b>			<b>80.00</b>	<b>190</b>	<b>5.09</b>	<b>6.16</b>	<b>23.17</b>	<b>23149.00</b>	<b>28516.00</b>	<b>2.99</b>	<b>3.32</b>	
IV a-Sub humid southern plain & Aravalli hill zone (Sub humid)	Rajsamand	RT-351	3.40	10.00	25	3.98	5.10	28.14	27820.00	37900.00	3.48	4.74

State Average yield: 3.40q/ha.



**KVK, Sawai Madhopur, Variety-RT-351**



**KVK, Jalore, Variety-RT-351**

## 4.2 Performance of Soybean CFLDs

During Kharif 2016-17, 240 CFLDs of soybean along with packages were demonstrated in 83.00 ha area in Rajasthan by KVK Bhilwara, Chittorgarh, Banswara and Dungarpur. The productivity of soybean was highest in Sub humid southern plain & Aravali hill zone (IV A) where the yield under CFLDs was 12.04 q/ha.

**Table 4.2.1 Performance of Soybean CFLDs conducted during Kharif 2016-17**

Agro Climatic Zone/Climate	KVKs	Variety demonstrated	Dist. Avg. (q/ha)	Area (in ha)	No. of Demo	Yield (q/ha)		% increase	Net Return (Rs./ha)		BCR	
						Check	Demo		Check	Demo	Check	Demo
IV A Sub humid southern plain & Aravali hill zone	Bhilwara Chittorgarh	JS- 95-60	10.34	20.00	50	8.45	11.42	35.14	17990.00	25464.00	1.02	1.13
			12.47	20.00	32	11.62	13.38	15.14	12900.00	18030.00		
			<b>Total</b>	<b>40.00</b>	<b>82</b>	<b>6.69</b>	<b>12.04</b>	<b>25.14</b>	<b>15445.00</b>	<b>21747.00</b>	<b>1.62</b>	<b>1.80</b>
IV B Humid southern plain	Banswara Dungarpur	JS- 95-60	08.45	23.00	58	6.8	10.86	59.70	7460.00	18252.00	1.52	2.1
			10.36	20.00	100	6.2	7.5	20.96	7465.00	10740.00	1.55	1.75
			<b>Total</b>	<b>43.00</b>	<b>158</b>	<b>6.50</b>	<b>9.18</b>	<b>40.33</b>	<b>7462.00</b>	<b>14496.00</b>	<b>1.53</b>	<b>1.93</b>
V-Humid south eastern plain	Baran Bundi Kota Jhalawar	JS- 95-60	5.68	20.00	50	09.75	15.20	55.90	26000.00	34000.00	2.53	2.89
			9.31	20.00	50	12.72	15.74	23.74	21168.00	30874.00	1.84	2.13
			12.5	10.00	20	12.50	16.20	29.60	17750.00	26105.00	0.93	1.20
			32.5	20.00	50	15.43	19.01	23.20	14019.00	22370.00	1.45	1.68
			<b>Total</b>	<b>70.00</b>	<b>170</b>	<b>14.38</b>	<b>9.18</b>	<b>81.15</b>	<b>43199.5</b>	<b>63922.5</b>	<b>4.14</b>	<b>4.92</b>

State Average yield: 10.36 q/ha.



**KVK, Bundi, Variety-JS-95-60**



**KVK, Baran, Variety-JS-95-60**

### 4.3 Performance of Groundnut CFLDs

During Kharif 2016-17, 259 CFLDs of Groundnut along with packages were demonstrated in 103.00 ha area in Rajasthan by KVK Jodhpur, Sriganaganagar, Bikaner, Jaisalmer and Chittorgarh. The productivity of groundnut was highest in Hyper arid partial irrigated zone (36.70 q/ha).

**Table 4.3.1 Performance of Groundnut CFLDs conducted during Kharif 2016-17**

Agro Climatic Zone/Climate	KVKs	Variety demonstrated	Dist. Avg. (q/ha)	Area (in ha)	No. of Demo	Yield (q/ha)		% increase	Net Return (Rs./ha)		BCR	
						Check	Demo		Check	Demo	Check	Demo
I A Arid western zone	Jodhpur	GG-20	18.50	20.00	50	16.29	19.42	19.21	47692.00	61716.00	2.50	2.88
	Sriganaganagar	HNG-10	21.00	30.00	75	18.50	22.50	21.62	50020.00	65800.00	2.78	3.25
		<b>Total</b>		<b>50.00</b>	<b>125</b>	<b>11.6</b>	<b>13.97</b>	<b>20.42</b>	<b>32570.67</b>	<b>42505.33</b>	<b>1.76</b>	<b>2.04</b>
I-C Hyper Arid Partial Irrigated zone	Bikaner	HNG-69	26.99	30.00	75	31.40	36.70	16.88	64470.00	83320.00	3.00	3.70
	Jaisalmer	HNG-69	04.65	14.00	35	15.00	16.43	09.53	29437.00	46727.00	1.05	1.42
	Chittorgarh	UG-5	11.66	09.60	24	13.39	15.93	18.97	31106.00	40025.00	2.22	2.47
		<b>Total</b>		<b>103.6</b>	<b>259</b>	<b>35.7</b>	<b>41.52</b>	<b>32.9</b>	<b>78791.84</b>	<b>106288.67</b>	<b>4.02</b>	<b>4.82</b>

State Average yield: 19.63 q/ha.



**KVK, Chittorgarh, Variety-UG-5**

#### 4.4 Performance of Groundnut CFLDs

During Kharif 2016-17, 573 CFLDs of Groundnut on full technology packages were demonstrated in 222.00 ha area in Gujarat by KVK Tapi, Banaskantha, Sabarkantha, Mehsana, Patan, Kutch-I, Jamnagar, Rajkot, Bhavnagar, Amreli, and Junagadh. The productivity of Groundnut was highest in Kutch district (27.51 q/ha).

**Table 4.4.1 Performance of Groundnut CFLDs in Gujarat during Kharif 2016-17**

Agro Climatic Zone/Climate	KVKs	Variety demonstrated	Dist. Avg. (q/ha)	Area (in ha)	No. of Demo	Yield (q/ha)		% increase	Net Return (Rs./ha)		BCR	
						Check	Demo		Check	Demo	Check	Demo
South Gujarat	Tapi	GG-20	16.91	20	50	11.90	16.39	37.73	37190.00	59089.00	2.58	3.41
North Gujarat	Banaskantha	GG-20	11.23	20	50	21.45	29.25	36.36	50820.00	86495.00	2.41	3.86
	Sabarkantha		22.73	20	50	21.00	24.13	14.90	39450.00	51346.00	1.53	1.68
	Mehsana		04.90	20	50	16.50	19.51	18.24	49596.00	64978.00	2.6	3.13
	Patan		04.92	20	80	13.40	16.80	25.37	28740.00	37120.00	2.58	2.71
		<b>Total</b>		<b>80</b>	<b>230</b>	<b>17.56</b>	<b>21.49</b>	<b>22.13</b>	<b>42966.00</b>	<b>61810.00</b>	<b>2.56</b>	<b>3.19</b>
North west arid	Kutch-I	TG-37A	22.21	40	91	23.26	27.51	16.51	32741.00	40910.00	1.80	1.95
North Saurashtra	Jamnagar	GG-20	14.25	20	50	19.00	22.88	20.42	22500.00	26520.00	1.43	2.04
	Rajkot		11.35	20	25	11.50	13.03	13.30	24623.00	32868.00	1.71	1.91
	Bhavnagar		13.19	20	47	18.75	24.55	30.93	61338.00	82459.00	2.54	3.04
	Amreli		10.01	12	30	23.69	27.83	17.47	65808.00	82669.00	2.93	3.38
		<b>Total</b>		<b>62</b>	<b>152</b>	<b>19.88</b>	<b>22.44</b>	<b>22.99</b>	<b>36685.00</b>	<b>55932.00</b>	<b>2.17</b>	<b>2.72</b>
South Saurashtra	Junagadh	GG-20	15.78	20	50	20.25	22.80	12.62	47700.00	62164.00	2.22	2.69

State yield: 13.85 q/ha.



**KVK, Mehsana, Variety-GG-20**



**KVK, Kutch-I, Variety-TG-37A**

#### 4.5 Performance of Sesame CFLDs in Gujarat

During Kharif 2016-17, 163 CFLDs of Sesame on full technology packages were demonstrated in 66 ha area in Gujarat by KVK Jamnagar, Rajkot, Amreli, and Junagadh. The yield of Sesame was highest in North Saurashtra (8.17 q/ha).

**Table 4.5.1 Performance of Sesame CFLDs in Gujarat during Kharif 2016-17**

Agro Climatic Zone/Climate	KVKs	Variety demonstrated	Dist. Avg. (q/ha)	Area (in ha)	No. of Demo	Yield (q/ha)		% increase	Net Return (Rs./ha)		BCR	
						Check	Demo		Check	Demo	Check	Demo
North Saurashtra	Jamnagar Rajkot Amreli	GT-2	04.83	20	50	7	7.96	13.71	23000.00	32220.00	1.89	2.38
			01.45	20	25	4.25	4.75	11.76	7900.00	9850.00	1.37	1.45
			03.27	16	40	8.16	9.73	19.24	42950.00	53952.00	4.23	4.94
		<b>Total</b>		<b>56.00</b>	<b>115</b>	<b>7.29</b>	<b>8.17</b>	<b>10.77</b>	<b>24018.00</b>	<b>32144.00</b>	<b>2.47</b>	<b>3.01</b>
South Saurashtra	Junagadh	GT-2	03.95	20.00	47	6.00	7.18	19.72	17200.00	25445.00	2.01	2.64

State yield: 04.12 q/ha



**KVK-Amreli, Variety-GT-2**

#### 4.6 Performance of Soybean CFLDs

During Kharif 2016-17, 274 CFLDs of Soybean along on technology packages were demonstrated in 90.00 ha area by KVK Surat, Narmada, Dahod and Vadodara in Gujarat. The productivity of Soybean was found highest in Middle Gujarat zone (17.04 q/ha).

**Table 4.6.1 Performance of Soybean CFLDs in Gujarat during Kharif 2016-17**

Agro Climatic Zone/Climate	KVKs	Variety demonstrated	Dist. Avg. (q/ha)	Area (in ha)	No. of Demo	Yield (q/ha)		% increase	Net Return (Rs./ha)		BCR	
						Check	Demo		Check	Demo	Check	Demo
South Gujarat	Surat Narmada	NRC-37 JS-335	07.90	20	74	12	16.5	37.5	16400.00	27750.00	2.02	2.65
			08.09	20	50	13.6	16.5	21.32	16000.00	26000.00	1.97	2.51
		<b>Total</b>		<b>40</b>	<b>124</b>	<b>12.50</b>	<b>16.25</b>	<b>30.29</b>	<b>16200.00</b>	<b>26875.00</b>	<b>1.99</b>	<b>2.58</b>
Middle Gujarat	Dahod Vadodara	NRC-37	07.87	20	50	12.81	15.2	18.65	21008.00	28451.00	2.07	2.42
			08.32	40	100	16	18.9	18.12	23888.00	32660.00	2.23	2.53
		<b>Total</b>		<b>60</b>	<b>150</b>	<b>14.93</b>	<b>17.04</b>	<b>18.35</b>	<b>22447.00</b>	<b>30555.00</b>	<b>2.15</b>	<b>2.47</b>

State yield: 07.97q/ha



KVK, Vadodara Variety-NRC-37

### 5. Performance of CFLDs during Rabi 2016-17

Rajasthan is the largest producer of rapeseed-mustard and area wise is first in the country. During Rabi 2016-17, a total of 2050 Cluster Front Line Demonstrations on Mustard were laid out in the 800.00 ha. Out of 2050 planned demonstrations, 1600 Cluster Front Line Demonstrations were conducted in 640.00 ha areas in Rajasthan while 450 demonstrations were laid out in 160.00 ha by KVKs of Gujarat.

Table 5.1 Implementation of CFLDs during Rabi 2016-17 in Rajasthan & Gujarat

Sl. No.	State	Crop	Sanctioned		Implemented	
			Demo	Area (ha)	Demo	Area (ha)
1.	Rajasthan	Mustard	1650	660.00	1600	640.00
2.	Gujarat	Mustard	750	300.00	450	160.00
Total			2400	960.00	2050	800.00

#### 5.1 Performance of CFLDs on Mustard during Rabi 2016-17 in Rajasthan

During Rabi 2016-17, mainly NRCHB-101, RH-749, NRCDR-2 and BR-50 varieties along with other technological intervention were demonstrated in all the agro-climatic zones of Rajasthan. The yield of Mustard was recorded highest in flood prone eastern plain zone (Semi-arid) where the (22.33 q/ha).

**Table 5.1.1 Performance of CFLDs on mustard during Rabi 2016-17**

Agro Climatic Zone/Climate	KVKs	Variety demonstrated	Dist. Avg. (q/ha)	Area (in ha)	No. of Demo	Yield (q/ha)		% increase	Net Return (Rs./ha)		BCR		
						Check	Demo		Check	Demo	Check	Demo	
III a – semi arid eastern plain	Jaipur	NRCDR-2	10.23	20	50	15.55	19.83	27.52	42256.00	56745.00	3.12	3.51	
	Ajmer	RGN-229	07.14	20	40	12.14	15.6	28.50	20726.00	29911.00	2.00	2.29	
	Tonk	RH-406	09.37	20	50	17.1	20.22	18.24	44070.00	53214.00	3.29	3.46	
	Dausa	IJ-31	14.62	20	49	14.97	18.01	20.30	33051.00	42222.00	2.3	2.74	
		<b>Total</b>		<b>80.00</b>	<b>189</b>	<b>14.94</b>	<b>18.41</b>	<b>23.64</b>	<b>35025.75</b>	<b>45523.00</b>	<b>2.68</b>	<b>3.00</b>	
III b - Flood prone eastern plain zone (Semi arid)	Alwar-1	NRCDR-2	13.91	20	50	18	23	27.77	31206.00	57470.00	1.1	1.2	
	Bharatpur	IJ-31	13.91	20	50	18	21	16.66	41800.00	50600.00	1.2	1.3	
	Karauli	NRCDR-2	14.95	20	50	19.5	22.5	15.38	51350.00	61100.00	1.2	1.3	
	Dholpur	RH-406	11.45	20	50	18.16	22.5	23.89	34900.00	46600.00	2.42	2.79	
		<b>Total</b>		<b>80.00</b>	<b>200</b>	<b>18.33</b>	<b>22.33</b>	<b>21.88</b>	<b>39556.50</b>	<b>52320.00</b>	<b>2.43</b>	<b>2.83</b>	
IV a- Sub humid southern plain & Aravalli hill zone (Sub humid)	Chittorgarh	IJ-31	09.47	20	50	16.45	19.75	20.06	32403.00	42513.00	2.48	2.79	
	Udaipur	NRCHB-101	08.87	20	54	12.65	15.75	24.50	22944.00	30656.00	2.16	2.36	
	Bhilwara	IJ-31	08.83	20	50	10.8	16.30	50.92	29200.00	41150.00	2.16	2.58	
	Rajsamand	RH-406	08.87	100	250	13.58	17.32	27.54	37530.00	49120.00	3.75	4.27	
Pratapgarh	NRCDR-2	14.10	20	43	10.7	14.3	33.64	21180.00	32720.00	2.8	3.05		
		<b>Total</b>		<b>260</b>	<b>647</b>	<b>41.26</b>	<b>52.88</b>	<b>89.27</b>	<b>91406.75</b>	<b>124239.5</b>	<b>7.89</b>	<b>8.94</b>	
IV b – humid southern plain	Dungarpur	NRCHB-101	11.82	20.00	98	12.00	16.20	35.00	17800.00	35400.00	2.67	3.68	
I a -Arid western plains zone	Jodhpur	Barmer-I	PM-26	14.00	40	100	13.81	17.82	29.03	32246.00	46081.00	2.99	3.82
				06.90	20	26	8.54	11.78	37.93				
		<b>Total</b>		<b>60.00</b>	<b>126</b>	<b>12.24</b>	<b>16.31</b>	<b>35.91</b>	<b>26504.25</b>	<b>38846.25</b>	<b>2.62</b>	<b>3.32</b>	
I b -Irrigated north western plain zone	Hanumangarh-I	RH-749	10.70	20	50	15.92	18.03	13.25	40300.00	47569.00	3.11	3.40	
I c -Hyper arid and partially irrigated western plain	Bikaner-I	Giriraj	09.58	30	75	14.23	17.95	26.14	29816.00	39286.00	2.49	2.67	
	Jaisalmer-I	IJ-31	11.00	20	40	11	12.72	15.63	22130.00	30164.00	2.32	2.78	
	Churu-I	NRCDR-2	09.88	20	50	11.69	17.61	50.64	21965.00	41057.00	2.10	2.87	
		<b>Total</b>		<b>70.00</b>	<b>165</b>	<b>12.23</b>	<b>15.55</b>	<b>26.96</b>	<b>24655.67</b>	<b>35625.56</b>	<b>2.33</b>	<b>2.76</b>	
II a - Transitional plain of inland drainage	Sikar	RNG-229	13.15	50	100	15.38	18.17	18.14	32271.00	40795.00	2.55	2.79	
	Jhunjhunu	NRCHB-101	05.55	87.2	218	14.85	20.32	36.83	32378.00	42656.00	2.43	2.74	
	Nagaur	IJ-31	11.99	20	50	17.5	20.58	17.60	42120.00	51455.00	3.3	3.8	
		<b>Total</b>		<b>157.2</b>	<b>368</b>	<b>15.62</b>	<b>19.21</b>	<b>23.26</b>	<b>33993.14</b>	<b>43188.43</b>	<b>2.64</b>	<b>2.94</b>	
II b- Transitional plain of Luni basin	Pali	NRCDR-2	11.50	20	40	7.06	12.46	76.48	22466.00	40366.00	2.59	3.52	
	Jalore	PM-26	10.30	20	50	12.5	13.99	11.92	20150.00	23263.00	1.77	1.82	
	Sirohi	RNG-229	10.75	20	50	11	15.40	40.00	27400.00	35280.00	2.73	2.98	
		<b>Total</b>		<b>60.00</b>	<b>140</b>	<b>8.43</b>	<b>12.85</b>	<b>61.42</b>	<b>21887.50</b>	<b>36090.75</b>	<b>2.39</b>	<b>3.10</b>	
V -Humid south eastern plain	Kota	NRCHB-101	15.00	20	40	17.25	21.56	24.98	39153.00	52960.00	2.75	3.26	
	Jhalawar	NRCDR-2	07.51	20	40	7.50	17.75	136.66	13646.00	25895.00	1.4	1.8	
	Bundi	RH-749	14.00	20	50	12.86	16.3	26.74	25364.00	35040.00	1.8	2.56	
	S. Madhopur	NRCDR-2	15.00	20	40	17.10	20.67	20.87	39153.00	53350.00	2.75	3.32	
Baran	NRCDR-2	15.00	20	50	21.34	24.02	12.55	50225.00	56897.00	3.49	3.55		
		<b>Total</b>		<b>100</b>	<b>220</b>	<b>15.66</b>	<b>20.82</b>	<b>45.18</b>	<b>34677.30</b>	<b>46960.60</b>	<b>2.53</b>	<b>2.97</b>	





KVK, Churu Variety-NRCDR-2



Field day at KVK, Alwar-I

### 5.2 Performance of CFLDs on Mustard during Rabi 2016-17

During Rabi 2016-17, mainly NRCHB-101, GDM-4 and CS-52 varieties were demonstrated in Gujarat. The yield of Mustard was highest in North Gujarat zone under package demonstrations. (17.32 q/ha).

**Table 5.2.1 Performance of CFLDs on mustard during Rabi 2016-17**

Agro Climatic Zone/Climate	KVKs	Variety demonstrated	Dist. Avg. (q/ha)	Area (in ha)	No. of Demo	Yield (q/ha)		% increase	Net Return (Rs./ha)		BCR	
						Check	Demo		Check	Demo	Check	Demo
North Gujarat	Banaskantha-I	GDM-4	15.94	20	50	12.00	17.12	42.66	25206.00	48421.00	2.34	3.76
	Sabarkantha		14.50	20	50	21.00	24.13	14.90	39450.00	51346.00	1.53	1.68
	Patan		07.60	20	50	14.42	17.52	21.49	34726.00	44106.00	3.2	3.6
		<b>Total</b>		<b>60.00</b>	<b>150</b>	<b>13.21</b>	<b>17.32</b>	<b>32.09</b>	<b>29966.00</b>	<b>46263.39</b>	<b>2.77</b>	<b>3.68</b>
North west	Kutch-II	GDM-4	13.40	20.00	28	13.18	15.00	13.81	38000.00	65000.00	2.41	3.17
South Saurasthara	Junagadh	GDM-4	10.00	20.00	42	8.00	9.84	23.04	7750.00	5164.82	1.47	1.85
Bhal and costal	Bhavnagar	NRCHB-101	15.00	10.40	20	11.50	14.42	25.39	12429.00	22552.99	1.85	2.08

State Average yield: 11.83 q/ha.



KVK, Sabarkantha, Variety-GDM-4



KVK, Kutch-II, Variety-GDM-4

## 6. Performance of CFLDs during summer 2017-18

During summer 2017, CFLDs on groundnut and sesame were conducted at farmers' fields total 168.00 ha area was covered under groundnut and 196.00 ha area were under sesame in Gujarat state. The details sanctioned and implemented are shown in table-6.1.

**Table 6.1 Implementation of CFLDs during Summer 2016-17**

Sl. No.	State	Crop	Sanctioned		Implemented	
			Demo	Area (ha)	Demo	Area (ha)
1.	Gujarat	Groundnut	450	180.00	414	168.00
2.		Sesame	500	200.00	475	196.00
Total			950	380.00	889	364.00

### 6.1 Performance of CFLDs on Groundnut in Gujarat

During Summer 2017, 414 CFLDs on GG-20, TG-37-A and GJG-9 varieties of Groundnut along with packages were demonstrated in 168.00 ha area by KVK Tapi, Surat, Narmada, Panchmahal, Vadodara, Kutch-I, Bhavnagar, Amreli, and Junagarh in Gujarat. The yield of Groundnut was highest in Amreli district (21.97 q/ha).

**Table 6.1.1 Performance of CFLDs on groundnut during Spring/Summer 2017**

Agro Climatic Zone/Climate	KVKs	Variety demonstrated	Dist. Avg. (q/ha)	Area (in ha)	No. of Demo	Yield (q/ha)		% increase	Net Return (Rs./ha)		BCR	
						Check	Demo		Check	Demo	Check	Demo
South Saurasthara	Junagadh	GG-2, TG-37A	18.13	20	42	13.00	14.7	13.07	18850.00	29275.00	1.51	1.81
South Gujarat Heavy rainfall	Tapi	TG-37A	19.19	20	50	12.40	18.32	47.74	29250.00	55232.00	1.84	2.17
Middle Gujarat	Vadodara, Panchmahal	GG-2, TG-37A	...	16	40	16.00	18.60	16.25	29250.00	40150.00	1.84	2.17
			...	36	92	9.2	12.5	35.86	16300.00	28000.00	1.79	2.27
<b>Total</b>				<b>52</b>	<b>132</b>	<b>12.60</b>	<b>15.55</b>	<b>26.05</b>	<b>22775.00</b>	<b>34075.00</b>	<b>1.81</b>	<b>2.22</b>
Bhal and Costal Zone	Bhavnagar	GG-2	17.14	20	50	18.00	20.00	11.11	11490.96	19280.00	1.26	1.42
North Suarashtra	Amreli	GJG-31	19.01	20	50	18.75	21.97	17.17	44925.88	64333.90	2.35	3.05
South Gujarat medium rainfall	Surat, Narmada	TG-37A	16.49	8	20	10.5	13.82	31.61	22325.00	34535.00	2.00	2.43
			10.62	20	50	18.5	20.45	10.54	67125.00	74050.00	3.13	3.25
<b>Total</b>				<b>28</b>	<b>70</b>	<b>12.25</b>	<b>15.81</b>	<b>29.37</b>	<b>24262.50</b>	<b>37867.50</b>	<b>2.56</b>	<b>2.84</b>
North west zone	Kutch-I	TG-37A	22.70	20	50	17.25	20.50	18.84	25120.00	34901.00	1.48	1.63



Critical input kits: KVK-Tapi

## 6.2 Performance of CFLDs on Sesame in Gujarat

During Summer 2017, 475 CFLDs on GT-2, GT-3 and GT-4 varieties of Sesame along with packages were demonstrated in 196.00 ha area by KVK Jamnagar, Rajkot, Porbandar, Bhavnagar, Surat, Narmada and Junagarh in Gujarat. The productivity of Sesame was highest in North Saurashtra (12.11 q/ha).

**Table 6.2.1 Performance of Sesame demonstration conducted during Spring/Summer 2017**

Agro Climatic Zone/Climate	KVKs	Variety demonstrated	Dist. Avg. (q/ha)	Area (in ha)	No. of Demo	Yield (q/ha)		% increase	Net Return (Rs./ha)		BCR	
						Check	Demo		Check	Demo	Check	Demo
North Saurashtra Zone	Jamnagar, Rajkot-I	GT-3	5.21 *	40	100	7.00	8.97	28.14	22650.00	31783.00	1.85	2.24
				20	42	12.5	15.25	22.00	37500.00	51375.00	2.20	2.58
	<b>Total</b>			<b>60</b>	<b>142</b>	<b>9.75</b>	<b>12.11</b>	<b>25.07</b>	<b>30075.00</b>	<b>41578.50</b>	<b>2.02</b>	<b>2.41</b>
South Saurasthara	Junagadh, Porbandar	GT-3	5.32 4.76	20	43	6.75	9.61	42.37	17500.00	35190.00	1.76	2.56
				40	100	4.8	5.74	19.58	8400.00	13770.00	1.47	1.77
	<b>Total</b>			<b>60</b>	<b>143</b>	<b>5.77</b>	<b>7.67</b>	<b>42.37</b>	<b>12950.00</b>	<b>24480.00</b>	<b>1.61</b>	<b>2.16</b>
South Gujarat medium rainfall	Bhavnagar	GT-3	5.71	16	40	6.5	7.63	17.38	17247.00	22950.00	1.64	1.95
South Gujarat	Surat, Narmada	GT-3	5.00	20	50	4.7	6.18	21.48	13900.00	20700.00	2.45	3.03
				20	50	7.3	8.3	13.69	5128.00	6478.00	1.5	1.6
	<b>Total</b>			<b>40</b>	<b>100</b>	<b>6</b>	<b>7.2</b>	<b>21.73</b>	<b>9514</b>	<b>13589.00</b>	<b>1.97</b>	<b>2.31</b>
South Gujarat Heavy rainfall	Tapi	GT-3	*	20	50	*	5.02	*	*	19130.00	*	2.42

\* The crop is grown first time in the district

## 7. Scenario & disposal pattern of Oilseed crops in Rajasthan and Gujarat

Seed is the foundation in agriculture. Use of quality seeds of farmer preferred variety(s) alone has proven to enhance 25-35 percent productivity in Oilseeds, Pulses and Cereals. Looking importance of quality seeds, KVKs have initiated to mobilize selected farmers of Cluster Front Line Demonstration for promotion of informal seed system to ensure availability of quality seeds of farmers preferred variety(s) at village level. Farmers have been motivated to keep at least 25 to 30% produce of CFLDs as seed. Farmers have committed to follow the same and details of variety and area wise seed disposal pattern of different oilseed crops are given in following tables (s).

### 7.1 Scenario and disposal pattern of seeds in Rajasthan

#### 7.1.1 Scenario and disposal pattern of Mustard production

Mustard is major oilseed crop of rabi season of Rajasthan and more than 50 present area of mustard comes under Rajasthan. Maximum areas were covered under NRCDR-2 variety followed by RH-749, RB-50 & RGN-229 during rabi 2016-17. This indicates that majority of selected farmers under CFLD kept produce as seeds for own multiplication and providing seeds to the farmers within village and neighboring villages (Table-13).

**Table 7.1.1 Production and disposal pattern Mustard produce demonstrated during Rabi 2015-16 in Rajasthan (28 KVK)**

Sl. No.	Variety	Area (ha.)	Total production (q)	Sold as grain (q)	Used as seed during rabi 2016-17 (q)	Area covered (ha)
1.	PM-26	72.00	1170.00	1020.00	115.00	2300.00
2.	PM-27	63.00	980.00	780.00	152.00	3040.00
3.	RH-749	190.00	3650.00	3260.00	260.00	5200.00
4.	RGN-229	90.00	1420.00	1200.00	190.00	3800.00
5.	NRCDR-2	320.00	6270.00	5070.00	1020.00	20400.00
6.	NRCHB-101	60.00	900.00	785.00	96.00	1920.00
7.	RB-50	62.00	930.00	625.00	210.00	4200.00
	Total	857.00	15320.00	12740.00	2043.00	40860.00

Mustard crop is not preferred by farmers of Gujarat. Moreover 52.00 quintals seeds of GDM-4 were kept as seed and used during 2016-17 in 1040.00 ha in Banaskantha, Patan & Mehsana districts of Gujarat.

**Table 7.1.2 Production and disposal pattern of Mustard covered during Rabi 2015-16 in Gujarat (KVK3)**

Sl. No.	Variety	Area (ha.)	Total production (q)	Sold as grain (q)	Used as seed during rabi 2016-17 (q)	Area covered (ha)
1.	GDM-4	90.00	1800.00	1720.00	52.00	1040.00

### 7.1.2 Scenario and disposal pattern of Groundnut production

Farmers have selected TAG-37A variety of groundnut suitable for rabi season cultivation in district Tapi of Gujarat. Majority of farmers used seed of three varieties of groundnut in 412.00 ha area during rabi 2016 & 17 in same as well as adjoining villages.

**Table 7.2.1 Production and disposal pattern Groundnut covered during Rabi 2015-16 in Gujarat (KVK-1)**

Sl. No.	Variety	Area (ha.)	Total production (q)	Sold as grain (q)	Used as seed during summer 2016-17 (q)	Area covered 2016-17 (ha)
1	GJG-9/TAG-37A/GJG-31	58.00	1522.00	1080.00	412.00	412.00

Total 300.00 ha. area was covered under CFLDs of groundnut during spring/summer 2016 and farmers kept quality seeds 781.00q of groundnut and same seed was utilized during Kharif season 2017 in 782.00 ha area in different villages of selected districts.

**Table 7.2.2 Production and disposal pattern of groundnut covered during Summer 2016-17**

Sl. No.	Variety	Area (ha.)	Total production (q)	Sold as grain (q)	Used as seed during summer 2016-17 (q)	Area covered 2016-17 (ha)
1	GG-20	14.00	385.00	290.00	76.80	76.80
2	GJG-31	52.40	1850.00	1375.00	356.00	356.00
3	GJG-09	41.60	1020.00	840.00	138.00	138.00
4	TAG-37A	192.00	4670.00	4261.00	211.00	211.00
5	Total	300.00	7925.00	6766.00	781.80	781.80

### 7.1.3 Scenario and disposal pattern of Sesame production

Sesame is one of the important among nine oilseed crops. This crop is grown in summer season in some parts of Gujarat state. Total 74.00 quintals seed have been utilized covering 2467.00 ha. area during summer season 2017 with active collaboration of partner farmers of selected villages under NMOOP.

**Table 7.3.1 Production and disposal pattern of groundnut during Summer 2016 (KVK 2)**

Sl. No.	Variety	Area (ha.)	Total production (q)	Sold as grain (q)	Used as seed during summer 2016-17 (q)	Area covered 2016-17 (ha)
1.	GT-02	14.00	72.00	52.00	18.00	600.00
2.	GT-03	30.00	173.00	108.00	56.00	1866.67
	Total	44.00	245.00	160.00	74.00	2466.67

### 7.1.4 Scenario and disposal pattern of Soybean production

Soybean is important oilseed which is mainly cultivated in Kharif season. Being a high-volume seed requirement crop, availability of quality seeds of farmers preferred variety(s) is major concern. Seed viability of soybean sometimes affects proper germination which results poor yield crop. For addressing these critical issues, scientists of KVKs organized training programme and mobilized selected farmers for promotion of informal seed system. Total 750.00 quintals seeds of JS-95-60 variety were kept and has been utilized during Kharif season 2017 in selected and neighboring villages of Jhalawar, Kota, Banswara etc. districts of Rajasthan.

**Table 7.4.1 Production and disposal pattern of groundnut during Kharif 2016-17 (KVK 8)**

Sl. No.	Variety	Area (ha.)	Total production (q)	Sold as grain (q)	Kept as seed for Kharif 2017-18 (q)	Area covered (ha)
1.	JS-95-60	163.00	3290.00	1420.00	750.00	1000.00

### 7.1.5 Scenario and disposal pattern of Sesame production

Til is a major oilseed of Kharif season of Rajasthan. Total 90.00 quintals seeds of RT-351 variety has been used in 3000.00 ha area during Kharif 2017.

**Table 7.5.1 Production and disposal pattern of groundnut in Rajasthan during Kharif 2016-17 (KVK 12)**

Sl. No.	Variety	Area (ha.)	Total production (q)	Sold as grain (q)	Kept as seed for Kharif 2017-18	Area covered (ha)
1.	RT-351	220.00	1230.00	1080.00	90.00	3000.00

### 7.1.6 Scenario and disposal pattern of groundnut production

Groundnut is cultivated in selected districts of Rajasthan during Kharif season. Productivity of Kharif groundnut is quite satisfactory. Farmers always face availability of quality seeds of preferred variety(s) of groundnut. Farmers have already kept 680.00 quintals seeds and same has been utilized during coming Kharif season 2017 in identified and adjoin villages.

**Table 7.6.1 Production and disposal pattern of groundnut during Kharif 2016-17(KVK10)**

S.No.	Variety	Area (ha.)	Total production (q)	Sold as grain (q)	Kept as seed for Kharif 2017-18	Area covered (ha)
1.	HNG-69	64.00	1840.00	1260.00	425.00	425.00
2.	UG-5	10.00	310.00	190.00	85.00	85.00
3.	GG-20	20.00	630.00	425.00	170.00	170.00
	Total	94.00	2780.00	1875.00	680.00	680.00

### 7.2 Scenario and disposal pattern of Oilseeds in Gujarat

#### 7.2.1 Scenario and disposal pattern of soybean production

Soybean is cultivated in few districts of Gujarat and Dahod district has highest area in this state. Total 518.00 quintals seed of NRC-37 and JS-335 have been used as seeds in Kharif season (2017) multiplication & farmer to farmer diffusion in selected villages.

**Table 7.7.1 Production and disposal pattern of soybean during Kharif 2016-17 (KVK4)**

Sl. No.	Variety	Area (ha.)	Total production (q)	Sold as grain (q)	Kept as seed for Kharif 2017-18	Area covered (ha)
1.	NRC-37	80.00	1570.00	980.00	428.00	570.00
2.	JS-335	20.00	390.00	218.00	90.00	120.00
	Total	100.00	1960.00	1198.00	518.00	690.00

#### 7.2.2 Scenario and disposal pattern of sesame production

Sesame is important Kharif oilseed crop of Gujarat state. Majority of farmers prefer to use seed of GT-4 and 152.00 quintals seed of GT-4 have been kept and will be sown in 5067.00 ha during coming Kharif 2017. Total area covered under quality seeds of improved variety(s) of Til has been used in 6051.00 ha during Kharif 2017.

**Table 7.8.1 Production and disposal pattern of sesame during Kharif 2016-17 (KVK6)**

Sl. No.	Variety	Area (ha.)	Total production (q)	Sold as grain (q)	Kept as seed for Kharif 2017-18	Area covered (ha)
1.	GT-2	20	109.00	90.00	13.50	450.00
2.	GT-3	20	106.00	84.00	16.00	534.00
3.	GT-4	56	320.00	176.50	152.00	5067.00
	Total	106.00	535.00	350.50	181.50	6051.00

### 7.2.3 Scenario and disposal pattern of Groundnut production

Groundnut is major oilseeds crop of Gujarat state. Majority of farmers prefer to grow in rainy season. Total 1215.00 quintals seed of GG-20, GJG-9 and TAG-37A have been kept and same has been used in 1215.00 ha area in during Kharif 2017-18.

**Table 7.9.1 Production and disposal pattern of groundnut during Kharif 2016-17 (KVK14)**

Sl. No.	Variety	Area (ha.)	Total production (q)	Sold as grain (q)	Kept as seed for Kharif 2017-18	Area covered (ha)
1.	GG-20	200.00	5240.00	4350.00	890.00	890.00
2.	GJG-9	12.00	360.00	210.00	110.00	110.00
3.	TAG-37A	20.00	530.00	380.00	215.00	215.00
	Total	232.00	6130.00	4940.00	1215.00	1215.00

## 8. Follow up package of technology demonstrated during 2015-16.

### 8.1 Follow up of package technology of mustard and groundnut

Ascertaining suitability, replicability, applicability of different technological packages is foremost requirement of any outreach programme, CFLDs were carried out with active collaboration of farmers and KVK Scientists of selected districts of Rajasthan & Gujarat. CFLDs on oilseeds has been started since rabi 2015-16 under National Mission on oilseeds & oil palm. Major oilseeds demonstrated under CFLD during rabi 2015-16 were mustard and groundnut, demonstrated in Tapi district. Total 2300 demonstrations by involving 2006 in Rajasthan 284 in Gujarat were laid out on mustard crop by 31 KVKs. It has been noticed that 1932 farmers have used all the technological packages in 3275.00 ha area during rabi 2016-17 under mustard crop. 1504 farmers partially adopted proven technological packages in 2061.00 ha during rabi 2016-17 in selected and neighboring villages (Table-24).

**Table 8.1.1 Follow up of package technology of mustard and groundnut demonstrated during year 2015-17**

State	Crop	No. of Demonstration laid out during Rabi 2015-16	No. of KVKs	Full follow up during Rabi 2016-17		Partial follow up during Rabi 2016-17	
				No. of farmers	Area (ha.)	No. of farmers	Area (ha.)
Rajasthan	Mustard	2006	28	1680	2435.00	1350	1820.00
Gujarat	Mustard	284	3	170	83.50	90	116.50
Gujarat	Groundnut	100	1	82	756.00	64	124.50
	Total	2390	32	1932	3274.50	1504	2061.00



## 8.2 Follow up of package technology of Sesame and Groundnut

Summer groundnut & sesame were demonstrated at 724 farmers' fields during 2016 by involving nine KVKs (seven for groundnut and two for sesame). Farmers have convinced with potentiality of different technological packages demonstrated during summer 2016. Total 1486.00 ha area have been covered by 632 farmers by following full technological component during summer 2017. 185 farmers have also partially adopted technological packages at their fields under sesame and groundnut during summer 2017 at 639.00 ha area.

**Table 8.2.1 Follow up of package technology of sesame and groundnut demonstrated during year 2015-17**

State	Crop	No. of Demonstration laid out during Summer 2016	No. of KVKs	Full follow up during Summer 2017		Partial follow up during Summer 2017	
				No. of farmers	Area (ha.)	No. of farmers	Area (ha.)
Gujarat	Sesame	110	2	94	256.00	57	204.00
Gujarat	Groundnut	614	7	538	1230.00	128	435.00
	Total	724	9	632	1486.00	185	639.00

## 9. Training and Monitoring

### 9.1 Training programmes

ICAR-Agricultural Technology Application Research, Jodhpur organized five, two-days training programmes for Nodal Officers of KVKs under NMOOP during 2016-17. The major objective of trainings was to enhance the production and productivity of traditional oilseeds. The nodal officers of KVKs will get acquainted with package of practices of major oilseed crops being demonstrated in cluster mode in Rajasthan and Gujarat state. The details of training programme organized are given below:

**Table 9.1 Training organized by ICAR-ATARI, Jodhpur**

Sl. No.	Training programs	Nodal officers (Number)
1	30-31, January, 2016	20
2	29-30, March, 2016	19
3	29-30, July, 2016	20
4	27-28, January, 2017	20
5	27-28, February, 2017	20

### Activities organized by ICAR-ATARI, Jodhpur



## 9.2 Monitoring of CFLDs on Oilseeds during 2016-17

Monitoring is an important activity in extension programmes. At programme level, the purpose of monitoring is to track implementation and outputs systematically, and measure the effectiveness of programmes. It helps determine exactly when a programme is on track and when changes may be needed. A number of officials visited in field for monitoring and data generation from the stakeholder where the cluster frontline demonstrations were conducted.

**Table 9.2 Visits made by ICAR-ATARI officials during 2016-17**

SL. No.	Date	Name of KVK	Visited by
1.	25.08.2016	Sabarkantha	Director, ICAR-ATARI, Jodhpur
2.	07.12.2016	Tonk	Dr. S.K. Singh Dr. M.S. Meena Dr. R.B. Kale Dr. Srinivas, A
3.	07.12.2016	Sabarkantha	SRF, DEO
4.	14.12.2016	Dausa	Dr. M.S. Meena
5.	15.12.2016	Karauli	Dr. M.S. Meena
6.	16.12.2016	Sawai Madhopur	Dr. M.S. Meena
7.	18.12.2016	Pali	SRF, DEO
8.	30.12.2016	Dungarpur	SRF
9.	31.12.2016	Chittorgarh	SRF
10.	10.01.2017	Alwar	SRF
11.	17.01.2017	Pali	Dr. R.B. Kale, Scientist



**Monitoring of CFLD at KVK, Banasthali (Tonk)**

## 10. Success story on Oilseeds production technology

### 10.1 Success Story of Kharif

#### KVK, Bikaner-I (Rajasthan)

**Crop and Variety:** Groundnut / HNG-69

Promising technology demonstrated:

- **Seed** (kg/ha): 80 kg
- **Spacing** (cm): R x P: 30 x 10 cm
- **Plant population:** 33-40 plants /m<sup>2</sup>
- **Seed treatment** : Carbendazim 2 gm/kg seed)
- **Nutrient management** (kg/ha): N:P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O:S:Zn (20:40:20:20:20)
- **Weed management:** Post emergence: Imazethapyr a.i. 10 SL@ 0.5 litre/ ha in 500-600 litre of water at 20-25 DAS
- **Insect-Pest & Disease Management:** **Disease: 1. Tikka:** Mancozeb 45 WP @ 2.0 g/l 10-15 days intervals if required. **2. Root rot: Carbendazim 50 WP @ 2.0 kg/ha**



**Specific characteristics of technology and performance**

Specific characteristic	Performance/Yield/disease Management (q/ha)
Carbendazim 2 gm/kg seed	Better plant stand with regard to vigor and growth
Imazethapyr <i>a.i.</i> 10 SL@ 0.5 litre/ ha in 500-600 litre of water at 20-25 DAS (Post emergence herbicide)	Yield 36.7 q/ha with effective weed management
<b>Tikka:</b> Mancozeb 45 WP @ 2.0 g/l 10-15 days intervals if required	Management of Tikka disease effectively resulted in 36.7 q/ha
<b>Root rot:</b> Carbendazim 50 WP @ 2.0 kg/ha	Management of root rot effectively resulted in

**Yield (q/ha)**

- Demonstration (q/ha): 36.7
- District average (q/ha): 33.16
- State average (q/ha): 20.13
- Variety potential yield (q/ha): 40.0

**KVK, Sabarkantha (Gujarat)**

**Crop and variety:** Groundnut / GG-20

**Technology demonstrated:** Seed var.GG-20, Trichoderma harzianum, Rhizobium+PSB culture liquid, method & time of seed treatment and rectification of deficiency of micro nutrient.

**Performance of technology vis-à-vis local check (increase in productivity and returns):** Yield-27.5 qt/ha, selling rate Rs. 4200/-qt. Local check Yield 22.5 qt/ha increase in yield 22.22% by adopting improved technology & information.

**Institutional Involvement:** KVK demonstrated seed GG-20 40kg proven and bio pesticides-Trichoderma -1kg and 500 ml liquid bio-fertilizers and method & time of seed treatment and rectification of deficiency of micronutrient. Timely weed management by post emergence weedicide i.e. Imazethapyr.

**Success Point:** Increased productivity up to 22.22%

**Farmers' feedback:** By adopting technology large seeded variety saving of 25% seed due sowing in recommended spacing & Due to MIS 30 % water saving in drip irrigation, due to use biofertilizers saving of 10 kg N & 8 kg P<sub>2</sub>O<sub>5</sub>. Low incidence of stem rot. Increased yield 22.22 %. Area under Kharif Groundnut will be increased in coming year due to low cost of cultivation and it is cash and short duration crop.



**KVK- JAIPUR-I, Rajasthan**

**Crop and Variety:** Sesame / RT-351 along with package of practices

**Technology demonstrated:** Variety RT-351 along with full package of practice

**Specific characteristics of technology and performance**

Specific characteristic	Performance/Yield/disease Management (q/ha)
Short duration, uniform seed size and white colour of seed	7.07

### Yield (q/ha)

- Demonstration (q/ha) : 7.07
- District average (q/ha) : 2.63
- State average(q/ha) : 2.88
- Variety potential yield (q/ha) : 10.0

**Technology demonstrated:** Improved variety, Seed treatment with Vitavax Power, Azotobactor and PSB Culture, Fertilizer management (with 40:25:20 kg/ha N: P: S), Integrated Weed Management and plant protection measures, etc.

**Performance of technology vis-à-vis local check (increase in productivity and returns):** Results indicated that Sesame variety RT-351 obtained 8.75 q/ha yield whereas yield of local check was 5.35 q/ha against over local check. Increase in yield was 63.55% higher and similar trend was observed in net return (39,625) higher and B:C Ratio (2.83) as compared to check or local variety.

**Institutional Involvement:** KVK Jaipur-I organized an off-campus training and field day

**Success Point:** Used quality seed of improved variety, seed treatment for management of soil and seed born disease, integrated weed management with hand weeding and chemical weed control, fertilizer management and plan protection measures.

**Farmers Feedback:** Majority of farmers are preferred to high yield, uniform seed size, white colour of seed and moderate resistant to Phyllode disease.



**KVK, Amreli (Gujarat)**

**Crop and Variety:** Sesame / GT-4 along with package of practices.

**Technology demonstrated:** Variety (GT-4) and component (Azadirachtin and Beauveriya bassiana) along with full package of practices demonstrated

Specific characteristic	Performance/Yield/disease Management (q/ha)
White seeded, high yielding and Short duration, disease tolerant	11.2

**Yield (q/ha)**

- Demonstration (q/ha) : 11.2
- District average (q/ha) : 5.00
- State average(q/ha) : 4.80
- Variety potential yield (q/ha) : 7.7

**Crop and variety:** Sesame (GT-4)/ along with full package of practices

**Technology demonstrated:** Variety GT-4, Component -Azadirachtin and Beauveriya bassiana.

**Performance of technology vis-à-vis local check (increase in productivity and returns):** 30.23%





**Institutional involvement:** Agricultural Research Station, JAU, Amreli- and Bio agent -Bio control Lab., Dept. of Entomology, JAU, Junagadh

**Success point:** New high yielding variety and less pests attack and diseases infestation

**Farmers feedback:** White seeded, high yielding and short duration. Farmers have shown interest for increasing area during kharif 2017

### KVK, Jhalawar (Rajasthan)

**Crop and Variety:** Soybean / JS 95-60 along with package of practices

**Technology demonstrated:** Variety: JS-9560, Seed rate: 80 kg seed/ha, Seed treatment:- Seed treat with Bavistin 1:1 @ 2g/kg seed

**Seed inoculation:** Seed inoculation of 500 ml/ 80 kg seed Rhizobium culture + Phosphorus Solubilizing Bacteria 500 ml/80 kg seed.

#### **Insect pest management:**

1. Girdle Beetle: Spray profenofos (2ml/l) or triazophos (1.5 ml/l).
2. Green semi looper: Spray profenofos (2 ml/l) or quinalphos (2 ml/l).

#### **Disease management:**

**Yellow Mosaic:** Dimethoate 30 EC 1 lit. /ha

**Weed Management:** Spray of Sodium Acefluorfen 16.5% + Clodinofofpropargyl 8% EC (Ready Mixed product) @ 1000 ml/ha at 20-25 days after sowing.

#### **Fertilizer management:**

1. 20 kg/ha N, 40 kg/ha P, 20 kg/ha K and 20 kg/ha sulphur.



## 10.2 Success Story of Rabi

### KVK-Kota (Rajasthan)

**Crop & variety:** Mustard/ NRCHB-101 along with full package of practices

#### Technology demonstrated

- Use of improved variety NRCHB-101
- Seed treatment with metalaxyl @ 6.0 g /kg seed and with Imidacloprid 48 FS @6 ml/kg seed
- Soil treatment with *Trichoderma viride* @ 3.0 kg/ha (mixed with 20 kg FYM)
- Sowing of crop in rows of 30 cm apart with seed rate of 4-5 kg/ha
- Recommended NP (80:40 kg/ha) .Use of SSP in place of DAP. Soil application of Zinc sulphate (21%) @ 20 kg/ha
- Plant protection measures against aphid, painted bug as per the recommendation

**Institutional involvements:** KVK Kota conducted FLD on mustard under NMOOP during Rabi 2016-17. KVK provided critical inputs viz. seed variety NRCHB-101, metalaxyl and Imidacloprid for seed treatment, *Trichoderma viride*, zinc fertilizer to the farmer. KVK scientists visited demonstration fields time to time for monitoring and provided technical guidance as per need. Field days were also organized for the villagers to popularize the technology among them.

**Success point:** Higher yield & economic returns under demonstrated technology

**Outcome:** Mustard yield: 27.5 q/ha under demonstration practice against 20.0 q under farmers practice

Practice used	Total cost of cultivation	Gross income	Net income	Cost benefit ratio	% increase in yield over FP
FLD techniques	23400	96875	73475	4.13	37.5





### KVK, Kutch-I (Gujarat)

**Crop and Variety:** Mustard / NRCHB-101 along with package of practices

**Technology demonstrated:**

- Demonstration of improved variety (NRCHB-101) of Mustard was conducted
- Reduced the deficiency of micronutrients (Zn, S, Fe) by application of micronutrients i.e ZnSo4 @ 20-25 kg/ha at sowing time in soil. Foliar application of micronutrients during flowering stage.
- Use of Sulfex 80 WP helps as prophylactic measures for management of Powdery Mildew disease.
- Monitoring and control of sucking pest by the use of Yellow Sticky trap carried out.
- Weed control measures by pre-emergence application of Pendimethyline @ 1kg a.i /ha.

**Specific characteristics of technology and performance:** Early maturing bold seeded variety which helps to escape from PM disease in Gujarat condition

Demonstration (q/ha)	:	31.00
District average (q/ha)	:	16.95
State average (q/ha)	:	15.75
Variety potential yield (q/ha)	:	28.00

**Performance of technology vis-à-vis local check (increase in productivity and returns)**

- Yield of demonstration plot (Q/ha): 31.00
- Yield of check plot ( Q/ha): 26.50
- B:C ratio (Demo.) : 2.48
- B:C ratio (Check.) : 2.17

Practice used	Total cost of cultivation (Rs.)	Gross income (Rs.)	Net income (Rs.)	Cost benefit ratio	% Increase
Package Demonstration	37500	93000	55500	2.48	16.98



### **Institutional Involvement:**

- CFLDs on Mustard was conducted during Rabi-2016. Demonstrations were given in 20 ha area and covered 50 farmers in a single cluster of Jiyapar village. Farmers meetings were conducted before giving demonstration. Technology gap and local problems were analysed. Then, technology inputs were decided. Farmers training were given and explained the technologies to be adopted in demonstrations.
- Two times farmers meeting were conducted to analyse the technology gap and to get information on soil, water and other conditions. Farmers training were conducted before conducting demonstration. 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.

### **Success Point:**

- NRCHB-101 var. of Mustard is an early maturing variety recommended by DRMR-Bharatpur for Gujarat. Due to early maturity, it has been observed that this variety escape from the infection of PM disease in Gujarat condition. Market value of this variety also found high due to bold and dark black seeds.
- Use of Pendimethalin 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 check plot.
- 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 the emergence of PM disease.
- Due to use of ZnSo<sub>4</sub> @ 20-25 kg /ha seed weight was increased and also improve the quality of seed in respect to colour and size.

### **Farmers' feedback**

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

### Activities organized by ICAR-ATARI, Jodhpur





हर कदम, हर डगर

किसानों का हमसफर

भारतीय कृषि अनुसंधान परिषद

*AgriSearch with a human touch*

प्रकाशक

डॉ. एस.के. सिंह, निदेशक

भाकृअनुप-कृषि तकनीकी अनुप्रयोग संस्थान

जोधपुर 342005 (राजस्थान)

फोन: +91 291 2748412, 2740516, वेबसाइट: [www.atarijodhpur.res.in](http://www.atarijodhpur.res.in),

ईमेल: [atarijodhpur@gmail.com](mailto:atarijodhpur@gmail.com), फैक्स: +91 291 2744367