

ICAR-ATARI, Pune
DETAILS OF ANNUAL PROGRESS REPORT OF KVKs
(1st January 2019 to 31st December 2019)

1.1 Name and address of KVK with phone and e-mail

Address	Telephone	e-mail	Web Address
Krishi Vigyan Kendra, Junagadh Agricultural University, Nana Kandhasar (Chotila) Pin code : 363 520, Dist : Surendranagar	(02751) 294120	Surendranagar.kvk@gmail.com	-

1.2 Name and address of host organization with phone, fax and e-mail

Address	Telephone		e-mail	Web Address
	Office	FAX		
Vice Chancellor Junagadh Agricultural University, Junagadh - 362 001, (Gujarat), India	91-285- 2671784	+91-285- 2672004	E-mail: vc@jau.in	-

1.3 Name of the Senior Scientist and Head with phone & mobile no.

Name	Telephone /Contact		
	Residence	Mobile	e-mail
Mr. M. F. Bhoraniya	-	9428297863	mfbhoraniya@gmail.com

1.4 Year of sanction : October - 2005
DDG (AE), ICAR NEW DELHI F. No. 13-1/2003-AE-I.
July, 29, 2005

1.5 Staff Position (as on Dec, 2019) :

Sr. No.	Sanctioned post	Name of the incumbent	Discipline	If Permanent, Please indicate		Date of joining
				Current Pay Band	Current Grade Pay	
1.	Senior Scientist & Head	-	-	-	-	Vacant
2.	Subject Matter Specialist	Mr. M. F. Bhoraniya	Plant Protection	57700-182400 (UL-10)	-	18-09-12
3.	Subject Matter Specialist	Dr. B. C. Bochalya	Extension Education	57700-182400 (UL-10)	-	23-08-06
4.	Subject Matter Specialist	Dr. R. P. Kalma	Animal Science	57700-182400 (UL-10)	-	07-12-16
5.	Subject Matter Specialist	Mr. D. A. Patel	Horticulture	57700-182400 (UL-10)	-	20-01-17
6.	Subject Matter Specialist	-	Agronomy	-	-	Vacant
7.	Subject Matter Specialist	-	Home Science	-	-	Vacant
8.	Programme Assistant	Mr. A. K. Vala	B. Sc. (Agri)	39900-126600 (L-7)	-	10-08-18
9.	Computer Programmer	Mr. P. T. Patel	Computer Science	39900-126600 (L-7)	-	30-12-08
10.	Farm Manager	Mr. M. N. Patel	B. Sc. (Agri)	39900-126600 (L-7)	-	27-07-18
11.	Accountant/ Superintendent	Mr. R. P. Vagadiya	Assistant	39900-126600 (L-7)	-	01-12-11
12.	Stenographer	Mr. S. H. Shukla	Junior Steno	25500-81100 (L-4)	-	19-11-13
13.	Driver 1	-	-	-	-	Vacant
14.	Driver 2	-	-	-	-	Vacant
15.	Supporting staff 1	Mr. A. M. Dhadvi	Peon	14800-47100 (L-IS-1)	-	01-10-15
16.	Supporting staff 2	-	-	-	-	Vacant

1.6 Total land with KVK :

Sr. No.	Item	Area (ha)
1	Under Buildings	3.56
2.	Under Demonstration Units	1.04
A	Crop cafeteria	0.10
B	Fodder Unit	0.02
C	Nursery Unit	0.03
D	IFS Model	0.60
E	Compost Pit	-
F	Vermicompost Unit	-
I	NADEP Unit	-

J	Automatic Weather Station	0.18
K	Medicinal & Aromatic Plants Unit	0.11
3.	Under Crops	16.84
4.	Horticulture Crops	2.97
A	Mix Fruit Crops (sapota + mango + gunda) Orchard	0.90
B	Jamun Orchard	0.45
C	Tamarind Orchard	1.00
D	Date Palm Orchard	0.50
E	Guava Orchard	0.12
5.	Under Road	1.70
6.	Farm Pond	0.24
Total		26.35

1.7 Infrastructural Development :

A. Buildings :

Sr . N o.	Name of building	Source of funding	Stage					
			Complete			Incomplete		
			Completion Year	Plinth area (Sq. m)	Expenditure (Rs.)	Completion Year	Plinth area (Sq. m)	Expenditure (Rs.)
1.	Administrative Building	ICAR	23/7/2009	595	30,20,600	-	-	-
2.	Farmers Hostel	ICAR	23/7/2009	296	20,74,700	-	-	-
3.	Training Hall	RKVY	23/7/2009	190.99	13,94,500	-	-	-
4.	Rent Proof Godown	ICAR	09-09-2009	158.48	8,30,750	-	-	-
5.	Staff Quarters (6)	ICAR	--	--	--	-	-	-
	E-Type Quarters (1)	ICAR	2009	103.66	30,55,000	-	-	-
	D-Type Quarters (2)	ICAR	2009	85.76		-	-	-
	C-Type Quarters (3)	ICAR	2009	62.22		-	-	-
6.	Demonstration Units	ICAR	--	--	--	-	-	-
	Close Type (Cement roof dheet)	ICAR	23-7-2009	78	6,16,000	-	-	-
	Open Type (Cement roof dheet)	ICAR	23-7-2009	78		-	-	-
7.	Impliment		23-7-	77.33	3,00,000	-	-	-

	Shed		2009					
8.	Pilot Scale Processed Plant	RKV Y	23-7-2009	198	15,72,000	-	-	-
9.	Godown & Processing Shed	RKV Y	23-7-2009	71	5,00,000	-	-	-

B. Vehicles :

Type of vehicle	Year of purchase	Cost (Rs.)	Total kms. Run	Present status
Jeep (Bolero)	2006-07	4,96,000/-	374000	Working
Splender Bike	2010-11	42,980/-	53000	Working
Mahindra Scorpio	2019-20	10,44,743/-	7766	Working

C. Equipments & AV Aids :

Name of the equipment / Implements	Year of purchase	Cost (Rs.)	Present status
Computer	2006-07	49968	Working Cond.
Copier Machine	2006-07	49816	Working Cond.
Automatic Seed Drill	2006-07	31500	Working Cond.
Tractor mounted Sprayer (200ltr)	2007-08	43000	Working Cond.
Shredder	2007-08	43000	Working Cond.
Dibbler	2007-08	900	Working Cond.
Cotton stock puller	2007-08	1200	Working Cond.
Digital copier with network	2008-09	115300	Working Cond.
Rain gun	2007-08	19800	Working Cond.
LCD projector	2008-09	89985	Working Cond.
Rotavator	2008-09	96000	Working Cond.
Laptop	2008-09	47500	Working Cond.
Harrow cum cultivator (2)	2008-09	75000	Working Cond.
Groundnut Decorticator	2008-09	96530	Working Cond.
Mobile seed processing unit	2008-09	1685000	-
Thresher	2008-09	114000	Working Cond.
Zero till drill	2008-09	66700	Working Cond.
Air assisted blower type sprayer	2008-09	98750	Working Cond.
Digital Camera	2008-09	23600	Not working
Plasma TV	2008-09	73750	Working Cond.
Power Tiller	2010-11	1,15,000	Working Cond.
Mini Tractor (Mahindra)	2011-12	1,98,000	Working Cond.
Trinocular Microscope	2012-13	2,90,000	Working Cond.
B.O.D. Incubator	2012-13	1,14,000	Working Cond.
Laminar Air Flow	2012-13	1,99,000	Working Cond.
Batch top centrifuge	2012-13	46,524	Working Cond.

Electronic Balance	2012-13	19,905	Working Cond.
TDS meter	2012-13	6,333	Working Cond.
Temp & humidity indicator & controller	2012-13	33,071	Working Cond.
Digital Hot Air Oven	2012-13	46,333	Working Cond.
Deep Fridge	2012-13	47,571	Working Cond.
Computer -2	2012-13	72,618	Working Cond.
Vertical Autoclave	2012-13	27,900	Working Cond.
Computer-3	2016-17	34115	Working Cond.
Kyan	2016-17	130000	Working Cond.
Copier Machine	2016-17	144391	Working Cond.
RO System	2016-17	79900	Working Cond.
20 HP/10 STG Pump Set Falcon	2017-18	71750	Working Cond.
HP 280 G4 MT-Core i5 Computer-2	2018-19	98888	Working Cond.
20 HP 13 Stage Sub-Marshible Pumo	2018-19	86436	Working Cond.
Nikon D5600 Digital Camera	2018-19	49977	Working Cond.
Microtek Online UPS-2	2018-19	25600	Working Cond.
Water Motor Pump Mono	2018-19	8870	Working Cond.



Administrative Building



Trainees Hostel



Training Hall



Conference Hall



Rain Water Harvesting System



Water Storage Pond



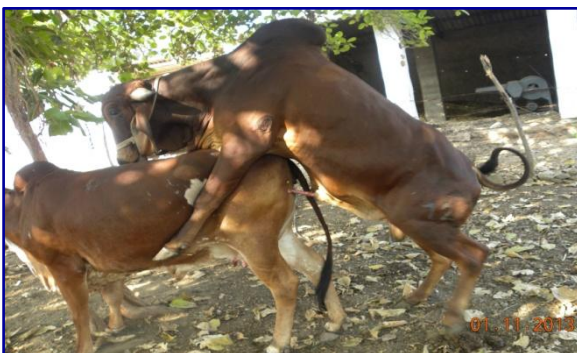
Seed Godown



Farm Impliment Demo Unit



Vermicompost Unit



Gir Cow Unit



Bio Gas Unit



Fodder Demonstration Unit



Medicinal Plant Unit



Nursery Unit



Solar Photo Voltaic Unit



Automatic Weather Station



Integrated Farming System (IFS) Unit



Nutri-Garden Unit



Mixed Fruit Crops Unit



Technology museum



Date Palm Plantation Unit



Guava Plantation Unit



Nadep Compost Unit



Crop Cafeteria



Poultry Unit



Goat Unit

1.8 Details of SAC meeting conducted (Year wise) :

The 15th (fifteenth) Scientific Advisory Committee Meeting of Krishi Vigyan Kendra, JAU, Surendranagar was held at seminar hall of KVK, Nana Kandhasar (Surendranagar) on 13th March, 2020. Following members were remained present in the meeting.

Sr. No.	Name & Designation	Position
1.	Dr. B. K. Sagarka Director of Extension Education, JAU, Junagadh	Chairman
2.	Dr. H. C. Chhodvadia Associate Extension Educationist, JAU, Junagadh	Member
3.	Dr. D. S. Hirpara ADR, DFRS, Targhadia	Member
4.	Dr. M. M. Talpada ARS & Head, CRS, Surendranagar	Member
5.	Shri. G. C. Bhalodi DDA-Ext and Project Director (ATMA), Surendranagar	Member
6.	Shri H. D. Vadi District Agriculture Officer, Surendranagar	Member
7.	Shri. B. M. Parmar GLDC, Field Super Visor, Chotila	Member
8.	Shri. Arjan K. Sakariya CEE. Jasdan	Member
9.	Shri. D. D. Sharma LDM Surendranagar	Member
10.	Shri Arasu Basesa DDM, NABARD, Surendranagar	Member
11.	Shri. A. C. Patel ADA (Cotton) Surendranagar	Member
12.	Dr. Nirav H. Joshi Veterinary Officer, Chotila, Surendranagar (Representative of Dy. Director, Animal Husbandry)	Member
13.	Shri. Punabhai Laljibhai Chauhan Progressive Farmer, Village : Karmad, Taluka : Chuda, Dist. : Surendranagar	Member
14.	Smt. Jashuben D. Meniya Village: Navagam, Taluka : Sayla, Dist. : Surendranagar	Farm women Member
15.	Smt. Rangpara Dhunaben R At & Post: Sanosara, Ta. Chotila, Dist. : Surendranagar	Farm women Member
16.	Shri Mohbatbhai Amarsangbhai Kathiya Progressive Farmer, Village: Ramdevgad, Taluka: Chuda, Dist. : Surendranagar	Special invitee
17.	Shri Khumansang Valajibhai Solanki Progressive Farmer, Village: Ramdevgad, Taluka: Chuda, Dist. : Surendranagar	Special invitee

18.	Shri Hamirsinh Parmar Progressive Farmer, Village : Gautamgadh, Taluka : Muli, Dist. : Surendranagar	Invitee Farmer
19.	Shri. Bhimbhai Jadavbhai Progressive Farmer, Village: Lakhchokiya, Taluka: Chotila, Dist. : Surendranagar	Invitee Farmer
20.	Shri. Rathod Rajubhai Ajmalbhai Progressive Farmer, Village: Rampara, Taluka : Wadhwan, Dist. : Surendranagar	Invitee Farmer
21.	Shri. Chavda Jayeshbhai Kanabhai Progressive Farmer, Village: Rampara, Taluka : Wadhwan, Dist. : Surendranagar	Invitee Farmer
22.	Shri. Vanrajbhai Jaymalbhai Chavda Progressive Farmer, Village: Rampara, Taluka: Wadhwan, Dist. : Surendranagar	Invitee Farmer
23.	Mr. M. F. Bhoraniya Senior Scientist and Head (I/c), KVK, JAU, Surendranagar	Member- Secretary
24.	Dr. B. C. Bochalya Scientist - Extension Education, KVK, JAU, Surendranagar	Participant
25.	Dr. R. P. Kalma Scientist - Animal Science, KVK, JAU, Surendranagar	Participant
26.	Shri D. A. Patel Scientist - Horticulture, KVK, JAU, Surendranagar	Participant

The meeting was chaired by Dr. B. K. Sagarka Director of Extension Education, JAU, Junagadh. Mr. M. F. Bhoraniya, Senior Scientist and Head, KVK, JAU, Surendranagar welcomed Hon'ble Chairman and all the members of the Scientific Advisory Committee.

Mr. M. F. Bhoraniya, Senior Scientist and Head (I/c), KVK, JAU, Surendranagar presented action taken report on suggestions made during 14th SAC meeting and present the progress report of KVK, Surendranagar for the period of January, 2019 to December, 2019 & action plan for the period of January, 2020 to December, 2020. Detailed discipline wise progress reports for the period of January, 2019 to December, 2019 & action plan for the period of January, 2020 to December, 2020 were presented by respective scientists viz, Dr. B. C. Bochalya (Agronomy and Extension Education), Mr. M. F. Bhoraniya (Plant Protection), Mr. D. A. Patel (Horticulture) and Dr. R. P. Kalma (Animal Husbandry & Home Science) Scientist, KVK, JAU, Surendranagar. House approved the same with some suggestions.

Dr. B. K. Sagarka Director of Extension Education, JAU, Junagadh Chairman of SAC meeting gave the presidential speech and made valuable suggestions. The chairman emphasized on promoting and popularizing organic farming in the Surendranagar district through training and invite progressive famers as a lacturar in training.

During discussion, Chairman and members of SAC made some suggestions for strengthening activities for improving KVK performance.

COMMITTEE MADE THE FOLLOWING SUGGESTIONS AFTER ACTIVE INTERACTION

- Gir Sawaj name change instead of “Sawaj” brand in all JAU product made available to farmers.
- Training on inter cropping and relay cropping should be organized.
- Training in agronomy discipline more than one crop should be covered.
- Popularized “Gir Sawaj MDP” for the control of pink boll worm in cotton and make availability at KVK to farmers.
- The training on fruit crops include *bahar* treatment and pruning in horticulture should be organized.
- Number of FLDs in kitchen garden increased and provide seed to farm women.
- The training on value addition in horticulture should be organized.
- Results of animal science FLDs on lucerne data should be checked.
- Include one more treatment in OFT title "Effect of mineral mixture and by pass protein supplement in increasing milk production in buffaloes".
- Training in animal husbandry organized collaboration with state department/ Sursagar dairy.
- Promote fodder grass *Dichanthium annulatum* (Jinjawa grass) in the area through front line demonstration.
- Small unit of “*Azolla*” established for demonstration to farmers at instructional farm.
- Provide information regarding crop production, crop protection and weather to farmers of Surendranagar district through SMS.
- Popularized organic farming in Surendranagar district through training and other extension activities.
- Bakari training to rural youth in home science discipline expert invite from Junagadh.
- To submit success story of Shri Hamirsinh Raghubha Parmar for farmer’s award in SEEG-2020, National Seminar organize at Junagadh under guidance of KVK .

The meeting was ended with key notes of Dr. B. K. Sagarka Director of Extension Education, JAU, Junagadh, gave the speech and stressed on proper follow of extension procedure and also emphasized to ensure optimum use of ICT among the clientele farmers. He appreciated about progress made by KVK. The Director of Extension Education, JAU, Junagadh emphasized on secondary agricultural activities specially on value addition so the farmers can get higher income and also said that Intergrated farming is the need of hours, so the farmers may sustain their income in adverse weather conditions. He complemented KVK team for better performance and said that KVK, Surendranagar is doing very good work and it should be continued for

betterment of farming community. The meeting was ended with vote of thanks given by Dr.R.P.Kalma scientist animal Science.



2.0 Details of District :

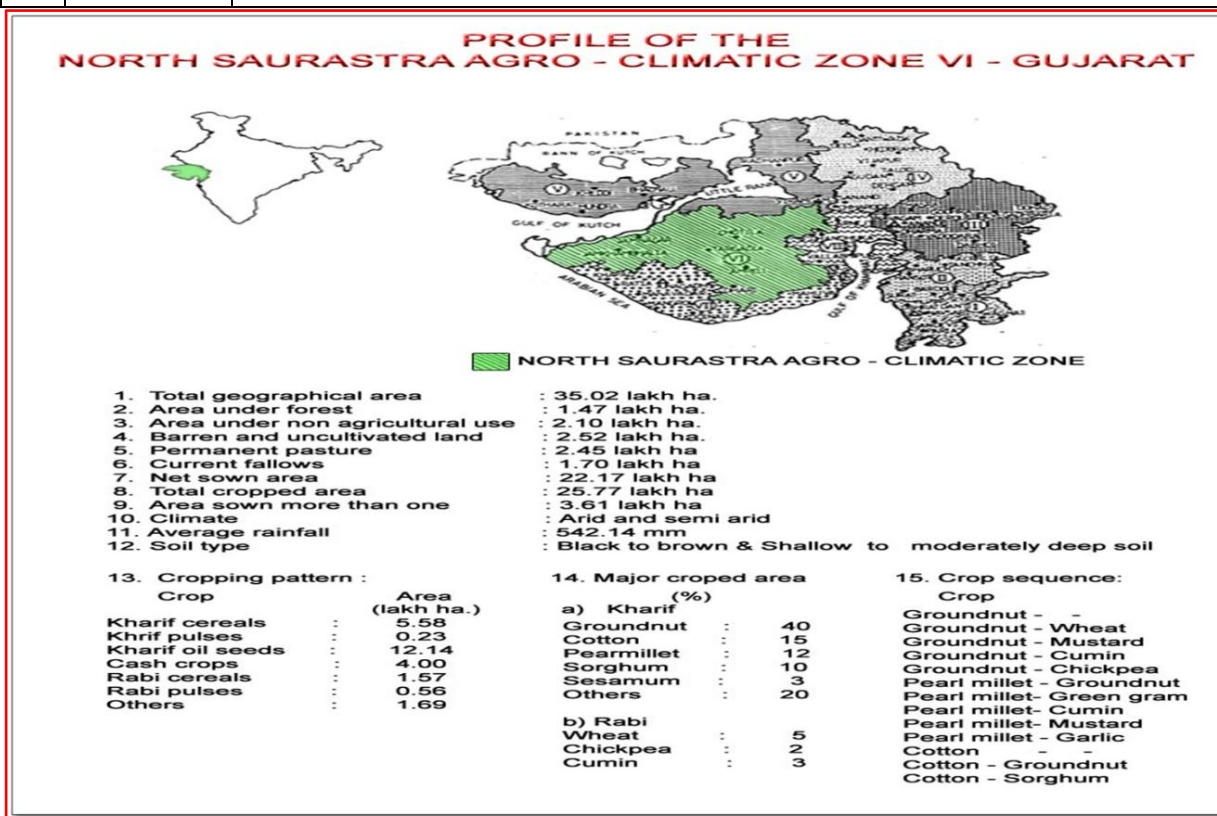
2.1 Major farming systems/enterprises (based on the analysis made by the KVK)

Sr. No.	Farming system/enterprise
1	<p>The district Surendranagar mainly falls in north Saurashtra agro-climatic zone. The district located in India at 22.30° to 23.45° North latitude and 71.00° to 72.15° East longitude. Surendranagar district is bounded in north by Gulf of Kutch and Mehasana district, in the south by Bhavnagar and part of Ahmedabad district, on the east by part of Ahmedabad and west by Rajkot district. The average annual rainfall is 585 mm. The average temperature of the district ranges with 41°C maximum to 11°C minimum. The soil is mostly medium black, shallow to moderately deep and calcareous in nature, therefore cotton is the major crop of the district. Some patches of saline soil found in Dasada and Lakhtar talukas, calcareous sandy soil found in some part of Chotila, Sayla, Thangadh & Dhrangdhra taluka and loamy soil is found in some part of Dhrangdhra taluka. The pH of the soil is alkaline and underground water is non saline in nature.</p> <p>The district covers 10.45 lakh ha geographical area out of which 6.49 lakh ha under cultivation, of which only 0.62 lakh ha is irrigated. Major area comes under rainfed farming. The main sources of irrigation are wells, tube wells, ponds and canals. The major crops of this region are cotton, sesame & pearl millet and others are sorghum, wheat, chick pea, groundnut, mustard, cumin, green gram, black gram, onion, garlic and vegetables. The fruit orchard area is very less. The Common varieties of major crops grown in Surendranagar district are given below</p>

Sr. No.	Major crops	Varieties
1	Groundnut	Bunch variety : GG-2, GG-7, TAG-37A, TPG-41,GJG-32 Semi spreading variety: GJG-9, GJG-31, GG-20, GJG-22, GG HPS-1 Spreading Variety : GAUG-10, GG-11, GG-13
2	Cotton	Bt. Cotton hybrids
3	Cotton desi/Hybrid	V-797, G-Cot-13, G-Cot-21, GJ.Cot-102, GJ.Cot.Hy-22
4	Wheat	Lok-1, GW-496, GW-322, GW-173, GW-366, GJW-463, GW-451
5	Bajra (Pearl Millet)	GHB-558, GHB-538, GHB-732, GHB-757, GHB-744 and GHB-905
6	Gram	GG-1, GG- 2, GJG-3, GG-5 and GJG-6
7	Green gram	Guj. Mug-4, K-851
8	Black gram	Guj. Urd-1, T-9
9	Sesame	GT-2, GT-3, GT-4, GJT-5, GJT-6 and GT-10
10	Castor	GAU-CH-1, GCH-6, GCH-7, GCH-9
11	Sorghum	GFS-4. GFS-5, Gundhari, S-1049 (Fodder)
12	Onion	Junagadh Local (Pilipatti), Gujarat White Onion-1, AFLR, AFDR, GJWO-3, GJRO-11
13	Tomato	G.Tomato-1, Junagadh Tomato-3, Junagadh Ruby, GJT-6, Pvt. Hybrids.
14	Brinjal	GBL-1, GBGR-1, GJB-2, GJB-3, GJRB-5 , Pvt. Hybrids.
15	Okra	GO-2, GO-3, Parbhani Kranti, GJO-6 Pvt. Hybrids.
16	Isabgul	Gujarat Isabgul-1, Gujarat Isabgul-2
17	Fenugreek	Gujarat Methi-2
18	Cumin	GC-4
19	Mango	Kesar
20	Sapota (Chiku)	Kalipatti, Cricket ball
21	Lemon	Kagdi Lime
22	Ber	Umran, Gola, Seb, Mehrun
23	Papaya	Madhu Bindu, Taiwan-786, GJP-1

2.2 Description of Agro-climatic Zone and major agro ecological :

Sr. No.	Agro-climatic Zone	Characteristics
1.	North Saurashtr a Agro climatic Zone VI	The district Surendranagar mainly falls in north Saurashtra agro-climatic zone. The district located in India at 22.30° to 23.45° North latitude and 71.00° to 72.15° East longitude. Surendranagar district is bounded in north by Gulf of Kutch and Mehasana district, in the south by Bhavnagar and part of Ahmedabad district, on the east by part of Ahmedabad and west by Rajkot district. The average annual rainfall is 585 mm. The average temperature of the district ranges with 41°C maximum to 11°C minimum. The soil is mostly medium black, shallow to moderately deep and calcareous in nature, therefore cotton is the major crop of the district. Some patches of saline soil found in Dasada and Lakhtar talukas, calcareous sandy soil found in some part of Chotila, Sayla, Thangadh & Dhrangdhra taluka and loamy soil is found in some part of Dhrangdhra taluka. The pH of the soil is alkaline and underground water is non saline in nature.



2.3. Agro – Ecological situation in the District :

Sr. No.	Agro Ecological Situation	Characteristics	Taluka	Soil Texture
1.	Shallow black	Medium calcareous, Moderate erosion, Moderate drain, MHC,AMC,CEC	Chotila & Thangadh	Silty loam
2.	Shallow sandy loam	Sloppy shallow, Highly erosive, Well drain, MHC,PHC & CEC	Muli & Sayla	Sandy loam
3.	Medium	Silty loam, Moderate drainage, High MHC, AMC& CEC	Wadhwan & Limbdi	Medium black Silty loam
4.	Black	Silty loam, Moderate drainage, High MHC, AMC& CEC	Chuda & Dhrangadhra	Medium black Silty loam
5.	Low lying black	Clay loam, Poor drainage High MHC, AMC &CEC Water-logged, Saline ground water	Lakhtar & Dasada	Medium black Silty loam

2.4 Soil type :

Sr. No.	Soil type	Characteristics
1	Medium black soils	Medium black soils generally occur at shallow depths (less than 5m) where basalts/shale forms the main rock unit and is exposed on the surface in the south, southwest and central part of the area. These soils are good in fertility but not suitable for heavy irrigation
2	Red Sandy soils	The red sandy soils occur in north east, east and south east part of the area.
3	Silty soils.	The silty soils are found along a narrow strip close to the little Rann of Kachchh in the north east and along shallow alluvial tracts and hard rock areas in central uplands has appreciable content of sand.

Available nitrogen and phosphorous status for the district was low. Wide spread deficiency of sulphur was found in the district. The available Zn status of the district was low to medium. In general, the soils of the district are low to medium in organic carbon status. Application of nutrients based on soil testing, use of bio-fertilizers, crop residue management, use of organic fertilizers, green manuring in irrigated area, use of zinc based fertilizer or gypsum and crop rotation will help in restoration of soil health.

2.5 Area, Production and Productivity of major crops cultivated in the district

Year : 2018-19

Crop	Surendranagar			Gujarat		
	Area (ha)	Production (MT)	Productivity (kg/ha)	Area (ha)	Production (MT)	Productivity (kg/ha)
Juwar	-	-	-	39119	52271	1336
<i>Kharif</i> -Bajara	6474	7522	1162	163540	228467	1397
<i>Summer</i> -Bajara	213	620	2911	228035	664155	2913
<i>Kharif</i> -Greengram	1589	577	363	63057	21072	334
<i>Kharif</i> -Groundnut	18120	35860	1979	1566372	2143343	1368
Castor	58112	23457	404	521877	944316	1809
<i>Kharif</i> -Sesame	15844	6616	418	80106	37026	462
<i>Summer</i> -Sesame	5440	2720	500	17620	10969	623
Cotton (Irrigated)	253051	662382	445	1855771	5247548	481
Cotton (Unirrigated)	94344	113285	204	804285	1055299	223
Guar seed	2172	869	400	134104	75365	562
Wheat (Irrigated)	28901	64722	2239	775440	2390546	3083
Wheat(Unirrigated)	1020	779	764	21716	16588	764
Gram	10949	7531	688	172954	234886	1358
Cumin	95740	31191	326	349616	199980	572
Funnel	15678	25108	1601	42752	66243	1549
Chillies	150	156	1040	4532	4443	980

Average Area, Production and Productivity : Year 2005-06 to 2018-19 (14-Year)

Crop	Surendranagar			Gujarat		
	Area (ha)	Production (MT)	Productivity (kg/ha)	Area (ha)	Production (MT)	Productivity (kg/ha)
Juwar	5813	7398	787	80486	105240	1313
<i>Kharif</i> -Bajara	26684	35693	1437	408569	456708	1246
<i>Summer</i> -Bajara	1026	2616	2568	251531	646261	2550
<i>Kharif</i> -Greengram	3643	1873	500	143482	67400	468
<i>Summer</i> -Greengram	224	147	675	55379	35341	1027
Pigeonpea	158	174	1062	257172	275646	1072
<i>Kharif</i> -Groundnut	17564	35355	1996	1611369	2620614	1606
<i>Summer</i> -Groundnut	535	1023	2023	102014	187672	1867
Castor	45718	91986	2127	549261	1121711	2026
<i>Kharif</i> -Sesame	45345	18803	428	191976	80616	441
<i>Summer</i> -Sesame	6185	3088	503	38339	20724	592
Cotton (Irrigated)	207415	768777	640	1674194	6548482	671
Cotton (Unirrigated)	207144	342494	285	860926	1412119	277
Total-Cotton	390271	1057902	459	2544121	7960608	532
Guar seed	10339	8163	657	208727	129486	586
Wheat (Irrigated)	33974	103889	3007	1044150	3126851	2964
Wheat (Unirrigated)	4950	4367	829	60410	44367	723
Total-Wheat	41082	108256	2648	1090197	3115705	2829
Gram	13809	14057	938	181882	199660	1075
Cumin	70146	47634	659	291785	189069	633
Funnel	5591	8937	1651	30145	55151	1947
Chillies	186	189	1017	7310	6992	961

Note : Cotton yield is in lint

B. Rainfall Status at Krishi Vigyan Kendra (Nana kandhasar) :

Date	Rainfall (mm)	Date	Rainfall (mm)
13-06-2019	05	06-09-2019	92
17-06-2019	06	07-09-2019	05
22-06-2019	45	08-09-2019	45
25-06-2019	18	09-09-2019	20
26-06-2019	76	10-09-2019	10
04-07-2019	03	11-09-2019	10
22-07-2019	42	25-09-2019	08
25-07-2019	08	26-09-2019	06
28-07-2019	04	27-09-2019	15
29-07-2019	45	28-09-2019	20
31-07-2019	33	29-09-2019	45
03-08-2019	20	30-09-2019	58
05-08-2019	09	01-10-2019	36
10-08-2019	180	09-10-2019	06
11-08-2019	05	30-10-2019	45
24-08-2019	25	02-11-2019	32
29-08-2019	20	07-11-2019	05
02-09-2019	45		
04-09-2019	40	Total Rainy Days	37
05-09-2019	42	Total Rainfall (mm)	1129

2.7 Production and productivity of livestock, Poultry, Fisheries etc. in the district :

Category	Population	Production	Productivity
Cattle			
<i>Crossbred</i>	3345	54,61,197 lit	-
<i>Indigenous</i>	600280	-	-
Buffalo	379240	-	-
Sheep			
<i>Crossbred</i>	461	-	-
<i>Indigenous</i>	77285	-	-
Goats	157611	-	-
Pigs			
<i>Crossbred</i>	-	-	-
<i>Indigenous</i>	-	-	-
Rabbits	104	-	-
Poultry- 8599			
Hens	-	-	-
<i>Desi</i>	-	-	-
Category		Production (Q.)	Productivity
Fish (Reservoir)	-	-	-

2.8. Details of Operational area / Villages

Year : 2016-17 to 2019-20

Sr. No.	Taluka	Name of the block	Name of the village	Major crops & enterprises	Major problem identified	Identified Thrust Areas
1.	Chotila	Chotila	Lakhchokiya	Cotton, Bajra, Sesame, Pulses, Dairy Farming	Uncertain and scattered rainfall, pink bollworm in cotton, Reddening in cotton, Wild animals, Lower milk production.	Dry farming technology Awareness for vaccination & artificial insemination of animals
			Bhimora	Cotton, Bajra, Groundnut, Sesame, Pulses Dairy Farming,	Uncertain and scattered rainfall, infestation of pink boll worm in cotton, sucking pest in vegetables, HS disease	Dry farming technology Awareness for vaccination & artificial insemination of animals
			Rajawad	Cotton, Cumin, Groundnut, Sesame, Pulses, Vegetables Dairy Farming,	Lack of irrigation facility, Uncertain and scattered rainfall, Lower milk production, HS disease	Dry farming technology, Awareness for vaccination & artificial insemination of animals
			Sanosara	Cotton, Bajra, Cumin, Wheat, Sesame, Dairy Farming,	Uncertain and scattered rainfall, Injudicious use of fertilizers & Pesticides, Black quarter disease	Adoption of organic farming, Bio-fertilizers & Vermi-compost Dry farming technologies Awareness for vaccination & artificial insemination of animals
2.	Sayla	Sayla	Hadala	Cotton, Groundnut, Cumin, Wheat, Sesame, Dairy Farming	Lack of knowledge of modern dry land technologies, lack of Awareness for vaccination & artificial insemination of	Awareness for vaccination & artificial insemination of animals

					animals	
			Chorvira	Cotton, Castor, G'nut, Wheat Dairy Farming,	Lack of knowledge of modern dry land technologies, FMD	Dry farming technologies, Awareness for vaccination & artificial insemination of animals
			Mangalkui	Cotton, Wheat, Cumin, Sesame, Bajra	Lack of knowledge of modern dry land technologies, Injudicious use of fertilizers & Pesticides	Dry farming technologies
			Dharadungari	Cotton, Bajra, Sesame, Wheat, Cumin, Dairy Farming,	Lack of knowledge about weed, pest and diseases & nutrient management HS disease, Trypanosomiasis disease	To motivate farmers to grow arid and semi arid horticultural crops. Awareness for vaccination & artificial insemination of animals
3.	Chuda	Chuda	Karmad	Dairy Farming, Cotton, G'nut, Sesame, Wheat, Cumin, Bajra, Gram	Soil salinity, poor drainage system FMD, Lack of knowledge of modern dry land technologies, INM, IPM etc	Irrigated farming technology, Awareness for vaccination & artificial insemination of animals
			Ramdevgadhi	Dairy Farming, Cotton, G'nut, Sesame, Wheat, Gram, Cumin, Bajra	Soil salinity, Awareness for vaccination & artificial insemination of animals	Irrigated farming technology, Awareness for vaccination & artificial insemination of animals
			Melapur	Dairy Farming, Cotton, G'nut, Sesame, Gram, Wheat, Cumin, Bajra	Soil salinity, low knowledge of scientific cultivation of crops ,HS disease, Injudicious use of fertilizers & Pesticides	Irrigated farming technology, Awareness for vaccination & artificial insemination of animals
			Chhatariyala	Dairy Farming, Cotton, G'nut, Sesame, Gram, Wheat, Cumin, Bajra	Soil salinity, poor water quality for irrigation, , low knowledge about INM, IPM , in crops,	Irrigated farming technology, Awareness for vaccination & artificial insemination of animals

2.9. Priority thrust areas:

Crop/Enterprise	Thrust area
Cotton	<ul style="list-style-type: none"> ✓ Increase productivity of the crops by adopting recommended practices of integrated pest management (Pink boll worm in Bt-cotton (IPM) and INM in cotton ✓ Recycling of the cotton stalk by cotton shredder
Groundnut, Sesame Castor and Wheat	<ul style="list-style-type: none"> ✓ Increase productivity of the crops by adopting recommended dry farming technologies, newly released varieties and INM in sesame
Cumin	<ul style="list-style-type: none"> ✓ Integrated Diseases Management and IPM
Chickpea	<ul style="list-style-type: none"> ✓ Increase productivity of the crops by newly released varieties and storage grain for seed purpose to farmers for next year.
Horticulture (Pomegranate, Lemon, Guava and chilly)	<ul style="list-style-type: none"> ✓ Value addition in fruits and vegetables, INM, training and pruning orchard and promote the farmers to adopting arid horticulture crops
Agriculture	<ul style="list-style-type: none"> ✓ Providing information and create interest to young generation for agriculture as a profession.
Farm waste	<ul style="list-style-type: none"> ✓ Recycling of the farm waste through composting, Vermi-composting and green manuring.
Micro Irrigation	<ul style="list-style-type: none"> ✓ Effective use of water by micro irrigation system, water harvesting structure and water harvesting techniques.
Animal Science	<ul style="list-style-type: none"> ✓ Increase productivity of the milk by adopting scientific feeding and breeding technologies and to create awareness about clean milk production.
Post Harvesting Technology (PHT)	<ul style="list-style-type: none"> ✓ Create awareness for proper storage and reduce post harvest losses.

3. Technical Achievement :

As per the mandates of KVK, before transfer of the technology to the farmers it has to be tested. The objective of an on-farm trial is to predict how different management practices, variety or any technology will perform compared to each other under KVK zone environment and cropping system. The process of testing a hypothesis conducted to farmers fields, so they can use the information in systematic manner and help them making production decisions on farm. To know the difference between traditional technology and tested technology at the same time or same season. Excellent work done by KVK Nana Kandhasar to assess different technologies like crop varieties, IDM of different crop IPM of different crop and animal husbandry.

3.1.1 Achievement on technology assessed and refined :

OFT

Year wise	Number of OFTs		Number of Farmers	
	Targets	Achievement	Targets	Achievement
2019-20	04	04	17	17

Year	No. of Technologies	No. of farmers covered	Livestock	Other (Home Science)
2019-20	04	17	1	-

Discipline	Technology Assessed/Refined
Agronomy	Assessment of response of bio fertilizers to wheat yield
Plant Protection	Management of wilt in cumin
	Assessment use of plant growth regulator and detopping technique enhance yield of cotton
Animal science	Assessment of use of probiotic in buffaloes of Surendranagar district
Horticulture	Varietal assessment of tomato GT-6 in Surendranagar district

Year wise	Area of FLD (ha)		No. of Farmers	
	Targets	Achievement	Targets	Achievement
2019-20	64	64	160	160

Year wise	Training (including sponsored, vocational and other trainings carried under Rainwater Harvesting Unit)					Extension Activities			
	Number of Courses			Number of Participants		Number of activities		Number of participants	
	Clientele	Targets	Achievement	Target s	Achievement	Targets	Achievement	Targets	Achievement
2019-20		68	66	1655	1705	152	344	18175	25253

3.1.2 Abstract of interventions undertaken (Year- 2005-2006 to 2020-21)

Sr. No.	Thrust area	Crop/ Enterprise	Identified Problem	Interventions					
				Title of OFT if any	Title of FLD if any	Title of Training if any	Title of training for extension personnel if any	Extension activities	Supply of seeds, planting materials etc.
1	-	Groundnut	Low yield	-	Varietal evaluation	IPM in Groundnut Control measures for pest and diseases of kharif corps Management of pest and disease of Groundnut	1. Preseasonal training on rabi crops 2. Preseasonal training on kharif crops 3. Extension methods	Filed Day - 10	FLD :Seed inputs : GG-20, GJG-9, GJG-31, GJG-32, GJG-22 Insecticide : Mancozeb 75WP
2	-	Sesamum	Low yield	Effect of Supplementary Irrigation On yield of sesamum	Varietal evaluation	Management of pest & disease of sesame Importance of thinning, gap filling & maintenance of plant population in major kharif crops			FLD : Seed inputs : Guj.Sesamum-2, 3 & 4 OFT : Endosulphan 35 %

						Pure seed production techniques in sesame			
						Pest management in sesame			
						Pure seed production technique in sesame			
3	-	Cotton	Low yield	Management of sucking pests in Cotton	Varietal evaluation	Production technology of cotton & groundnut			FLD :
						IPM in cotton			Seed inputs : RCH-2
						Precautions while handling pesticides			Insecticide :
						Economic use of fertilizers in major kharif crops			Imidachloprid 17.8 %
									Acetamaprid 20 %
									Methyl-o-demetone 25 %
									OFT :
									Thiomethoxan 25 %
									Imidachloprid 17.8 %
									Acetamaprid 20 %
									Dimethoate 30 %
									Methyl-o-demetone 25 %
4	-	Bio-agent	Heavy infestation	Application of Tricho derma against stem rot Disease	Yield evaluation	Importance of IPM			FLD :
						Selection of chemical pesticides			Bio-agent :
									Trichoderma harzianum
									Culture
									OFT :

				in g'nut					Trichoderma harzianum Culture Castor cake
5	-	Gram	Low yield	-	Varietal evaluation	Integrated weed management in rabi field crops			Seed input : GG-1, GG-2, GJG-3, GJG-6 & GG-5 Insecticide : Beauveria
						Efficient water management in major rabi field crops			
6	-	Cumin	Low yield	-	Varietal evaluation	Improved cultivation practice for wheat and cumin			Seed input : Guj.Cumin-4 Fungicide : Mancozeb 75 WP Hexaconazol 5 %
						Plant protection measures for pest & disease in cumin			
						Integrated weed management in rabi field crops			
						Control measures for pest & disease in cumin & wheat			
						Efficient water management in major rabi field crops			
7	-	Wheat	Low yield	-	Varietal evaluation	Improved cultivation practice for wheat and cumin			Seed input : GW-366, GW-451 & GW-463 Insecticide :
						Control measures for			

						pest & disease in cumin & wheat			Endosulphan 35 %
						Efficient water management in major rabi field crops			Monocrotophos 36 %

3.1.3 Achievements on technologies assessed and refined (Year wise)

A. Abstract of the number of technologies assessed* in respect of crops/enterprises

2019-2020

Thematic areas	Cereals	Oilseeds	Pulses	Commercial Crops	Vegetables	Total
Varietal Evaluation	-	1	-	-	2	3
Seed / Plant production	-	-	-	-	-	-
Weed Management	-	-	-	-	-	-
Integrated Crop Management	-	-	-	1	-	1
Integrated Nutrient Management	1	-	-	-	-	1
Integrated Farming System	-	-	-	-	-	-
Mushroom cultivation	-	-	-	-	-	-
Drudgery reduction	-	-	-	-	-	-
Farm machineries	-	-	-	-	-	-
Value addition	-	-	-	-	-	-
Integrated Pest Management	-	-	-	-	-	-
Integrated Disease Management	-	-	-	1	-	1
Resource conservation technology	-	-	-	-	-	-
Small Scale income generating enterprises	-	-	-	-	-	-
Total	1	1	-	2	2	6

B. Abstract of the number of technologies refined* in respect of crops/enterprises

2019-20

Thematic areas	Cattle	Poultry	Sheep	Goat	Other	TOTAL
Evaluation of Breeds	-	-	-	-	-	-
Nutrition Management	-	-	-	-	-	-
Disease of Management	-	-	-	-	-	-
Value Addition	-	-	-	-	-	-
Production and Management	-	-	-	-	-	-
Feed and Fodder	-	-	-	-	-	-
Small Scale income generating enterprises	-	-	-	-	-	-
Women & Child care	-	-	-	-	-	-
Total	-	-	-	-	-	-

C. Abstract on the number of technologies refined in respect of livestock / enterprises

Year : 2019-20

Thematic areas	Cattle	Poultry	Sheep	Goat	Other	TOTAL
Evaluation of Breeds	-	-	-	-	-	-
Nutrition Management	-	-	-	-	-	-
Disease of Management	-	-	-	-	-	-
Value Addition	-	-	-	-	-	-
Production and Management	-	-	-	-	-	-
Feed and Fodder	-	-	-	-	-	-
Small Scale income generating enterprises	-	-	-	-	-	-
Women & Child care	-	-	-	-	-	-
Total	-	-	-	-	-	-

** Technology that is refined in collaboration with ICAR/SAU Scientists for improving its effectiveness.*

3.1.4 List of Technology Assessed (Year wise)

Year	Sr. No.	Thematic area	Name of the technology assessed	Area (ha.)	Number of trials	Remarks
2019-20	1	INM	Assessment of response of Bio fertilizers to wheat crop yield	1.2	3	
	2	VE	Varietal assessment of Brinjal GJHB-4 in Surendranagar district	1.0	4	
	3	VE	Varietal assessment of Tomato GT-6 in Surendranagar district	1.0	4	
	4	VE	Varietal assessment of sesamum Guj Til-4 in Surendranagar district	1.2	3	
	5	IDM	Management of wilt in cumin.	1.2	3	
	6	ICM	Assessment use of plant growth regulator and detopping technique enhance yield of cotton.	1.2	3	
	7	NM	Assessment of effect of mineral mixture and by pass protein supplement in increasing milk production in buffaloes	-	10	Ani Sci
	8	NM	Assessment of use of probiotic in buffaloes of Surendranagar district	-	5	Ani Sci

3.1.5 List of Technology Refined :

Thematic area	Name of the technology refined	Area (ha.)	Number of trials	Remarks
-	-	-	-	-

3.2 Details of each On Farm Testing

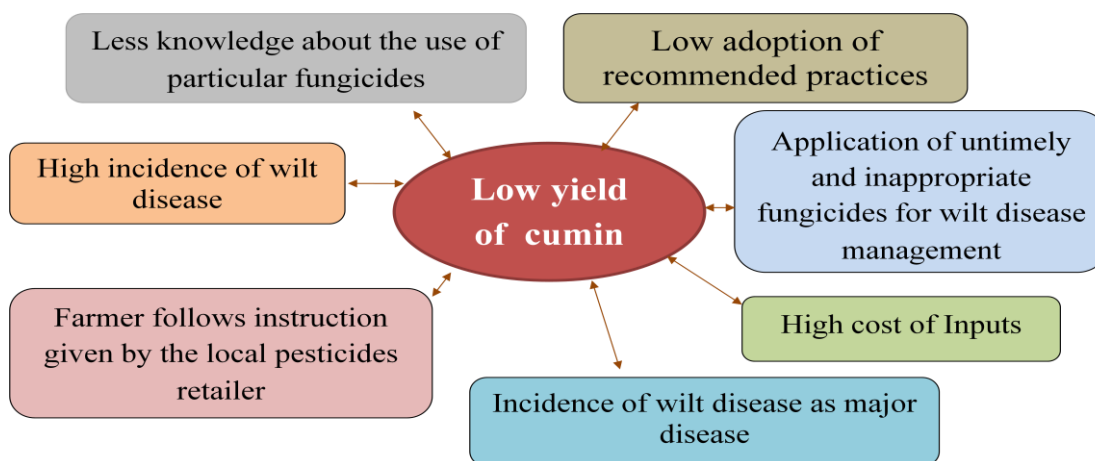
3.2.1 OFT : 1

1. Title of Technology: Management of wilt in cumin

2. Problem Definition:

Gujarat, which was the biggest producer of spices in the country, has slipped to third rank. Now, Andhra Pradesh tops in spice production with Rajasthan ranked second. Spice output, including that of coriander and cumin seeds, has dropped by 20% in Gujarat. In 2015-16 a disease had hit production of cumin and coriander in the state. Productivity of cumin crop first rank in India as well Asia in the world. Now a day productivity reduced and quality point of view suffering due to incidence of diseases and pest. Farmers are practicing excess use fungicides without followed recommended dose as prescribed by concerned scientist. Therefore cost of cultivation inevitably increase and some time, crop get failure due to inappropriate and excessive use of fungicides. Application of recommended dose for the control of wilt disease in the cumin crop is being undertaken for OFT. This OFT traces the transformation in the cumin production through recommended technology in the Surendranagar district.

• Problem Cause Diagram



3. Details of technologies selected for assessment : T₁-Farmers practice (Use of mancozeb, copper oxychloride and sulphur etc fungicides after infestation).
 T₂-Recommended practices Application of the *Trichoderma harzianum* (2x10⁶cfu/gm) @ 5.0 kg mixed in 1000 kg of FYM/ha at the time of sowing.
 T₃: Application of the *Trichoderma harzianum* (2x10⁶cfu/gm) @ 5.0 kg mixed in 100kg of sand/ha at the one month after germination of crop.
4. Source of technology : Department of Plant Pathology, CoA, JAU, Junagadh-2015

5. Production system and thematic area : Irrigated in *Rabi* season

6. Performance of the technology with performance indicators : 2019-20

Technology Assessed / Refined	Disease Intensity (%)	% Yield increase over farmer's practice	Seed Yield (Qt/ha)	Net Return (Profit) in Rs. / unit	BC Ratio
T ₁	18.33	-	5.97	56058	3.04
T ₂	0.33	34.00	8.00	82570	3.81
T ₃	3.00	27.80	7.63	78237	3.73

* Data indicated Disease Intensity in per cent before harvest the crop.

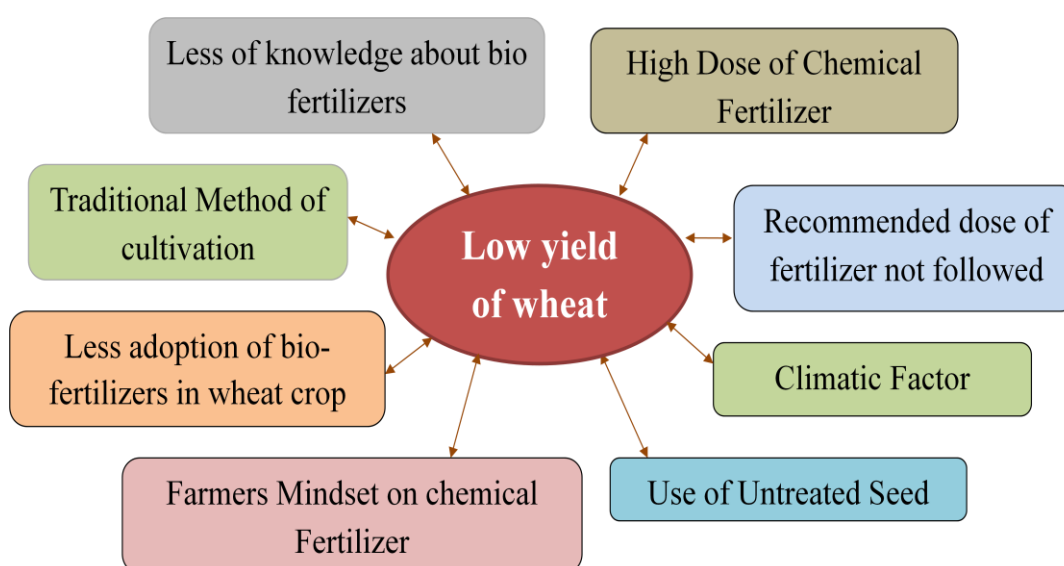
Results : Data in the table revealed maximum wilt disease intensity was observed in T₁ ie. 18.33. Seed yield was higher in recommended practices. More net return Rs. 26514/ha obtained from recommended practices of application of the *Trichoderma harzianum* (2×10^6 cfu/gm) @ 5.0 kg mixed in 1000 kg of FYM/ha at the time of sowing.

3.2.2 OFT : 2

- Title of Technology Assessed:-** Assessment of response of Bio fertilizers to wheat crop yield
- Problem Definition :**

In Rabi season the area of wheat cultivation in Surendranagar district is higher after cumin crops as compare to other crops. Due to canal facilities increased in this area the area under wheat crop also increased. But the continuous use of chemical fertilizer in this crops the productivity is stagnate day by day and cost of cultivation increased. High uses of chemical fertilizer in crops the soil fertility also reduced. In this situation the KVK decide to increase uses of bio-fertilizers to reduce cost of cultivation and increase soil fertility as well as quality and quantity of wheat yield.

Problem Cause Diagram:



3. Details of technologies : T₁- Farmer's practice: - 125- kg DAP & 190- Kg Urea /ha

selected for assessment

T₂- Recommended dose of fertilizer: 132Kg DAP + 206 Kg Urea (120-60-00).

T₃-75 percent RDF+ *Azotobacter* & PSB (100- Kg DAP+156- Kg Urea+3.0 lit *Azotobacter* + 3.0 lit. PSB)

4. Source of technology : Dept. Agronomy, JAU, Junagadh -2015

5. Production system and thematic area : Irrigated in *Rabi* season

6. Performance of the Technology with performance indicators :

Technology Option	Yield (qtl/ha)	% Increase in yield	Total Cost (Rs/ha)	Gross return / ha	Net Return (Profit) in Rs. / ha	BC Ratio
T ₁ - Farmer's practice	30.50	--	22500	54900	32400	2.44
T ₂ - Recommended	31.80	4.26	23800	57240	33440	2.40
T ₃ - Recommended	32.50	6.55	23100	58500	35400	2.53

Result: Data in the table revealed maximum grain yield was observed in T3 (Recommended practices) and T2 grain yield was increased by 6.55 and 4.26 per cent over control T1. More net return obtained Rs. 3000 from T3 (75 percent RDF+ *Azotobacter* & PSB (100- Kg DAP+156- Kg Urea+3.0 lit *Azotobacter* + 3.0 lit. PSB) over control treatment.

3.2.3 OFT: 3

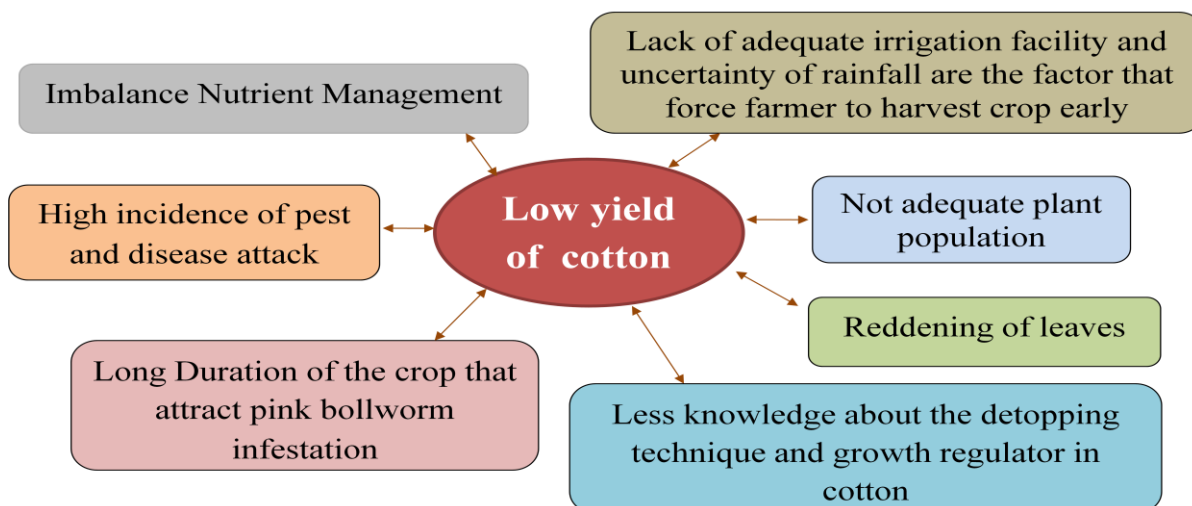
1. Title of Technology Assessed: - Assessment use of plant growth regulator and detopping technique enhance yield of cotton.

2. Problem Definition:

Surendranagar district ranks first in total cotton production of the state (22 %), followed by Rajkot (16.6 %), Bhavnagar (15.8 %) respectively. Thus cotton is very important crop of the district for sustainability point of view.

Since last two to three years, infestation of pink bollworm in cotton, uncertainty of rainfall and scattered rain and changing climatic condition, now farmers are forced to harvest crop as against they assumed for 180 to 240 days period. Ultimately this resulted in low production due to inadequate plant population and less no. of bolls per plant and per unit area. So that use of plant growth regulator and detopping technique enhance yield of cotton.

Problem Cause Diagram



Objective	:	To enhancement yield of cotton low cost technology
Reason for low yield of Cumin	:	1. No adoption of recommended practices. 2. Farmers follows instruction given by the local pesticides retailer 3. Lack of knowledge about the new technique and growth regulator.
Technical Intervention	:	Enhancement yield of cotton through low cost technique.
Treatments	:	T ₁ -Farmer practice : Natural growth of cotton plant T ₂ -Detopping the cotton plant at 75 day after sowing for uniform height T ₃ - Foliar spray with Ethylene 39% @ 2.0 ml/15 lit of water at 90 DAS
Source of Technology	:	T ₂ : CRS, JAU, Junagadh (2016) T ₃ : DFRS, JAU, Targhadia (2016)
Area	:	1.2 ha (0.40 ha each farmer)
No. of replication	:	03
Cost of OFT	:	975

Performance of the Technology:

(Selling Price: 5750/qui)

Treat	Average Yield (q/ha)	Cost of Cultivation (₹/ha)	Gross return (₹/ha)	Net return (₹/ha)	BCR	% Increase yield over farmer's practice
T ₁	15.97	29750	91808	62058	3.09	-
T ₂	18.90	30000	108675	78675	3.62	18.37
T ₃	17.43	30175	100242	70067	3.32	9.19

Results: Data in the table revealed that seed cotton yield was recorded maximum I recommended practices T₂ (18.90 qtl/ha) followed by T₃ (17.43 qtl/ha). Highest net return was obtained from T₂- Detopping the cotton plant at 75 day after sowing for uniform height (Rs. 78675/ha) followed by T₃ treatment that is foliar spray with Ethylene 39% @ 2.0 ml/15 lit of water at 90 DAS (Rs. 70067/ha) recommended practices.

3.2.4 OFT : 4

Title of Technology Assessed :- Varietal assessment of sesame in Surendranagar district

Objective	To increase yield of Sesame
Reason for low yield of Sesame	1. No adoption of recommended varieties. 2. Farmers follows instruction given by the local agro input retailer 3. Lack of knowledge about the location specific variety.
Technical Intervention	Introduction new variety of Sesame
	T ₁ -Variety: Local or GT-2 T ₂ -Variety: GT-4 T ₃ -Variety:GJT-6
Excepted cost	Rs 1800
Area	0.75
No. of replication	03
Source of Information	Agricultural Research Station, JAU, Amreli.

Technical Indicator	Economic Indicator
Yield (q/ha)	Cost of Production (Rs/ha)
	Gross return: (Rs/ha)
	Net return: (Rs/ha)
	B:C Ratio

Performance of the Technology:

(Price 9500/Q)

Treatment	Average Yield (q/ha)	Cost of Cultivation (₹/ha)	Gross return (₹/ha)	Net return (₹/ha)	BCR	% Increase yield over control
T ₁	4.80	14750	45600	30850	3.09	-
T ₂	5.20	14750	49400	34650	3.35	8.33
T ₃	5.40	14750	51300	36550	3.47	12.5

Results: Data in the table revealed that yield of sesame was recorded maximum in recommended practices T₃ (5.40qtl./ha) followed by T₂ (5.20 qtl/ha). Highest net return was obtained from T₃- GJT-6 (Rs. 36550/ha) followed by T₂, variety GT-4(Rs. 34650/ha) recommended practices.

3.2.5 OFT : 5

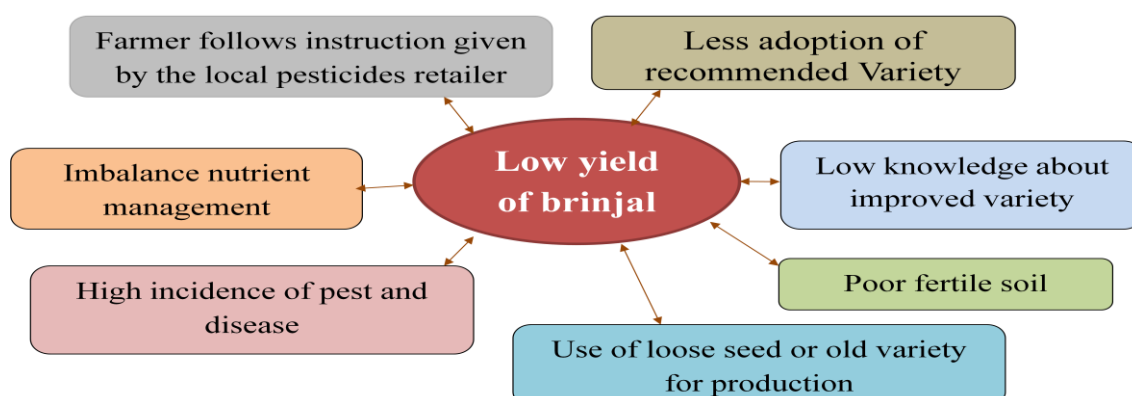
1. Title of Technology Assessed: - Varietal assessment of Brinjal GJHB-4 in Surendranagar district.

2. Production system:-

Brinjal or eggplant (*Solanum melongena*L.) is an important solanaceous crop of sub-tropics and tropics. In India, it is one of the most common, popular and principal vegetable crops grown throughout the country except higher altitudes. It is a versatile crop adapted to different agro-climatic regions and can be grown throughout the year. It is a perennial but grown commercially as an annual crop. Brinjal cultivation in India is estimated to cover about 8.14% vegetable area with a contribution of 9% to total vegetable production. The crop is largely grown in small plots or as inter crop both for cash and domestic consumption by farmers all over India. The major brinjal producing states are West Bengal, Orissa, Gujarat, and Maharashtra. The state has a great potential for brinjal production for domestic and exports markets but the yield of this crop is relatively low especially in rainy season due to lack of improved varieties as well as resistance to insect-pest and disease of economic importance and suitability to changing climatic conditions.

Brinjal variety GJHB-4 found suitable for cultivation in North Saurashtra Region of Gujarat. This variety resistance to jassid and fruit borer were less compared to local checks.

Problem Cause Diagram



Objective	To increase yield of Brinjal
Reason for low yield of Brinjal	1. No adoption of recommended varieties. 2. Farmers follows instruction given by the local agro input retailer 3. Lack of knowledge about the specific variety.
Technical Intervention	Introduction new variety of brinjal
Treatments	T ₁ - Variety: Local T ₂ - Variety: GJHB-4- 50 gm and Beauveria-2.0 kg T ₃ - Variety: GNRB-1 - 50 gm and Beauveria-2.0 kg
Excepted cost	2900
Area	0.25 ha
No. of replication	04
Results :	Result Awaited

3.2.6 OFT :- 6

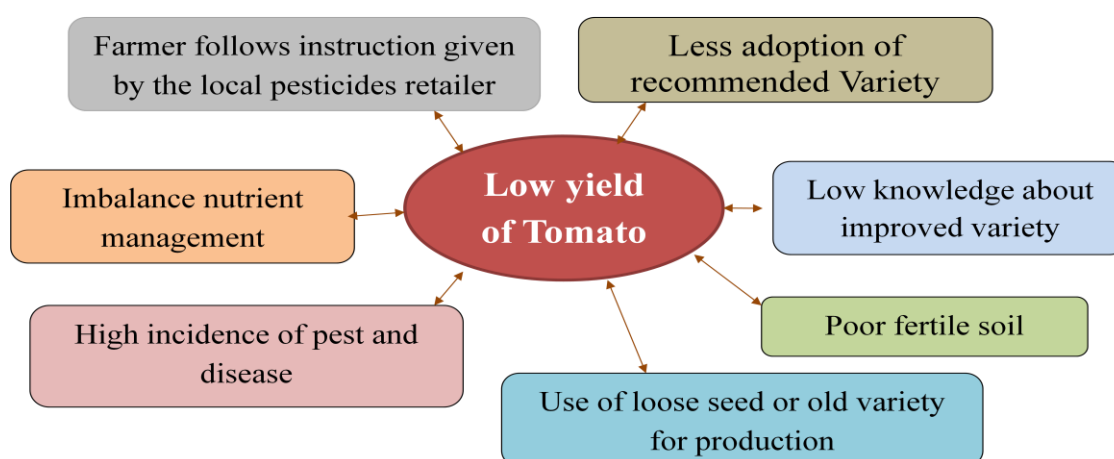
1. Title of Technology Assessed :- Varietal assessment of Tomato GT-6 in Surendranagar district.

2. Production system:-

Tomato (*Lycopersicon esculentum*) belongs to the genus *Lycopersicon* under Solanaceae family. Tomato is one of the most important "protective foods" because of its special nutritive value. It is one of the most versatile vegetable with wide usage in Indian culinary tradition. It is a perennial but grown commercially as an annual crop. Tomato cultivation in India is estimated to cover about 8.14% vegetable area with a contribution of 9 % to total vegetable production. The crop is largely grown in small plots or as inter crop both for cash and domestic consumption by farmers all over India. The major tomato producing states are Andhra Pradesh, Bihar, Chhattisgarh and Gujarat.

Tomato variety GT-6 found suitable for cultivation in North Saurashtra Region of Gujarat. This variety tolerant against leaf curl disease compared to local checks.

Problem Cause Diagram



Objective	To increase yield of Tomato
Reason for low yield of Brinjal	1. No adoption of recommended varieties. 2. Farmers follows instruction given by the local agro input retailer 3. Lack of knowledge about the specific variety.

Technical Intervention	Introduction new variety of brinjal
Treatments	T ₁ - Variety: Local/Private sector T ₂ - Variety: GT-6 50 gm and <i>Beauveria</i> -2.0 kg T ₃ - Variety: - GAT-5 - 50 gm and <i>Beauveria</i> -2.0 kg
Excepted cost	2600
Area	0.25 ha
No. of replication	04
Results :	Result Awaited

3.3 ACHIEVEMENTS OF FRONT LINE DEMONSTRATIONS :

Front Line demonstration (FLD) is a unique approach to provide an direct interface between researcher and farmers, as the scientists are directly involved in planning, execution and monitoring of the demonstrations of technologies developed by them and can get direct feedback from farmers' fields. KVK Nana Kandhasar conducted different FLDs on various crops like groundnut, sesame, cotton, gram, wheat, cumin as well as horticultural crops likewise brinjal, tomato, onion, kitchen garden and guava as well as animal husbandry lucerne crop, goat, buffalo. This enables the scientists of JAU to improvise research programme accordingly. In FLDs, the scientists provide technological inputs to different farmers to organize the demonstrations. Thus, FLDs provide an opportunity to researchers and extension personnel for understanding the farmer's resources and requirement to fine tune and/or modify technologies for easy adaptability at farmers' field.

1.3. A. Details of FLDs implemented (Year wise)

(Information is to be furnished in the following three tables for each category i.e. Oilseed, Pulse and Other)

Category	Crop	Thematic area	Technology Demonstrated	Season	Area (ha)		No. of farmers/ demonstration			Short fall
					Proposed	Actual	SC/ST	Others	Total	
					Oil Seed	Sesame	CP	Latest Variety	<i>Kharif</i>	
	Groundnut	DM	Latest Variety	<i>Kharif</i>	4	4	3	7	10	
	Groundnut	PP	Bio Agent	<i>Kharif</i>	2	2	1	4	5	
Pulse	Gram	CP	Latest Variety	<i>Rabi</i>	4	4	4	6	10	
Cereal	Wheat	CP	Latest Variety	<i>Rabi</i>	8	8	6	14	20	
Spices	Cumin	PP	DM	<i>Rabi</i>	8	8	7	13	20	
Commercial	Cotton	INM	Bio Fertilizer	<i>Kharif</i>	4	4	4	6	10	

3.3. B Performance of Front Line Demonstrations (Year wise)

Crop	Technology Demo.	Variety	No. of Farmers	Area (ha)	Demo. Yield Qtl/ha			Yield of local Check Qtl./ha	Yield Increased (%)	Data on parameter in relation to technology demonstrated	
					Highest	Lowest	Average			Demo	Local
Sesame	Variety	GT-4	10	4.0	8.25	3.88	6.49	5.59	16.06	4.94	4.28
G'nut	Variety	GG-20	10	4.0	23.63	13.50	18.96	16.18	17.20	3.35	2.98
G'nut	Bio agent	GG-20	05	2.0	22.63	14.50	18.60	16.54	12.45	3.32	3.04
Cotton	Variety	Bt	10	4.0	22.50	16.25	19.40	16.35	18.65	3.46	2.96
Wheat	Variety	GW-451	20	8.0	61.25	33.40	48.81	43.21	12.98	3.48	3.13
Cumin	Variety	GC-4	20	8.0	11.88	7.50	9.99	8.74	14.34	4.22	3.72
Gram	Variety	GJG-6	10	4.0	23.00	13.00	18.34	15.29	19.93	3.44	2.91

Category	Crop	Cost of cultivation (Rs/ha)		Gross returne (Rs/ha)		Net returne (Rs/ha)		BCR	
		Demo	Local	Demo	Local	Demo	Local	Demo	Local
Oil seeds	Sesame	14450	14380	71363	61490	56913	47110	4.94	4.28
	Groundnut	28710	27590	96235	82114	67525	54524	3.35	2.98
	Groundnut	28410	27590	94395	83941	65985	56351	3.32	3.04
Pulse	Gram	21330	21010	73350	61160	52020	40150	3.44	2.91
Cereal	Wheat	23490	23090	81761	72368	58271	49278	3.48	3.13
Spices	Cumin	27825	27605	117427	102695	89602	75090	4.22	3.72
Commercial	Cotton	30160	29700	104275	87881	74115	58181	3.46	2.96

Front-line demonstration on horticultural crops including fruits, vegetables and flowers

Crops	Season	No. of farmer	Area (ha)	Avg. yield (q/ha)	Local check			Improved Variety			Increase		Effective gain (Rs.)
					Av. Yield	C (Rs.)	R (Rs.)	Variety	C (Rs.)	R (Rs.)	C (Rs.)	R (Rs.)	
Brinjal	<i>Kharif</i>	10	01	256.10	324.5	9306	15030	GRB-5	10428	24414	1122	9384	8262
Tomato	<i>Kharif</i>	10	01	307.74	247.47	12410	14069	GAT-5	15360	27120	2950	13051	10101
Onion	<i>Rabi</i>	10	01	327.19	256.8	11370	18320	GAWO-2	12350	23210	980	4890	3910

Front-line demonstration on Livestock

Animal/ bird	Breed	No. of Raisers	Total no of animals/ birds	Avg. Prodn. Milk Production /day	Local check			Improved breed / tech.		Increase		Effct. Gain (Rs)
					Av. Prod. Production /day	C	R	C	R	C	R	
-	-	-	-	-	-	-	-	-	-	-	-	-

Crops	No. of farmer	Area (ha)	Avg. yield (q/ha)	Local check			Improved Variety			Increase		Effective gain (Rs.)
				Av. Yield	C (Rs.)	R (Rs.)	Variety	C (Rs.)	R (Rs.)	C (Rs.)	R (Rs.)	
Lucerne	10	1	440	355	12500	44568	Anand Lucerne-3	15000	55732	2500	11164	86664

• **Front-line demonstrations on Farm Implements and Machineries:**

Farm Implements and Machineries	No. of farmers	Area (ha)
-	-	-

3.3 C. Technical Feedback on the demonstrated technologies (2006 -2021)

Sr. No.	Crop	Variety/ Technology	Farmer's Feed Back
1	Wheat	GW-451	- 10 to 15 % more yield than Lok-1 and GW-496, baking quality observed good and suitable for chapatti making in diet. Grain size smaller than GW-496.
2	Gram	GJG-6	- It is good variety over local variety for all parameters. - Farmer demanded seeded varieties for vegetable purpose in both irrigated & non irrigated conditions. - Average 2-3 grains per pod is found in GJG6 variety whereas in local variety only 1-2 grains were observed. - In nutshell, farmers preferred GJG-6 variety due to High Yielding character, bold seeded size and prominent to wilt resistant. - Grain size of this variety is also of bold than local variety, hence may fetch good market price.
3	Cumin	GC-4	- High yielder and wilt resistance but poor and late germination - Farmer demanded blight resistant variety. - Sawaj <i>Trichoderma</i> is very popular and low cost as comparison to private companies product. Effective against cumin (Wilt) soil borne disease control.
4	Groundnut	GJG-9	- GJG-9 is good variety. - Early mature variety - Higher yielder over all local varieties.
5	Sesamum	GT-4	- Guj. Til-4 is higher yielder over all local varieties (GT-2). - Gujarat Til-4 is suitable for low rainfall area - GT-4 is higher yielder over local varieties and early maturity period 75 to 80 days. - GT-4 is higher yielder over local varieties and early maturity period, due short period more suitable for aberrant weather.
6	Cotton	Bt-Variety	- Like Bt variety resistance over larvae, it is require the sucking pest resistance variety - Farmer demanded sucking pest tolerant variety. - Location specific varieties should be developed - Bt. cotton requires more water and nutrient, do not withstand in moisture and nutrient stress conditions. So drought tolerant variety should supply. - Bt. cotton requires more water and nutrient, do not withstand in moisture and nutrient stress conditions.

			<p>So drought tolerant variety should supply.</p> <ul style="list-style-type: none"> - Letter stage of crop infected by pink boll worm so required tolerant Bt cotton varieties. - Azotobacter, PSB and Micro mix grade IV are low cost input gave good response in cotton crop. - Sawaj <i>Beauveria</i> is product of JAU, locally known as "Kandhasar Powder" very popular in the district. This low cost technology very effective against specially cotton pests. Farmers are used this product in large quantity. - Farmer's are adopted Gir Sawaj MDP for control pink boll worm in cotton crop satisfy with effective control and easy to used in field condition.
7	Tomato	GJ-3	- Higher yielder over all local varieties.
8	Brinjal	GJLB-4	<ul style="list-style-type: none"> - Higher yielder over local varieties. - Less infection observed fruit borer and white fly
9	Lucern	Anand L-3	<ul style="list-style-type: none"> - Anand Lucerne-3 is suitable for multi cutting and good regeneration capacity with good fodder quality. - Pests and diseases incidence in the low as compare to local variety
10	Onion	Onion-GAWO-2	- Less infestation of thrips was observed as compared to the checks.
11	Animal	Mineral mixture and by pass protein	- Use of mineral mixture and by pass protein increase milk yield and thereby helpful for farm economics

3.4 ACHIEVEMENTS ON TRAINING

A. On Campus Training :

Sr. No.	Thematic Area	No. of Courses	Participants		
			Male	Female	Total
1	Crop Production	8	202	24	226
2	Horticulture	4	77	46	123
3	Animal Science	4	0	96	96
4	Home Science	1	0	24	24
5	Agricultural Engineering	0	0	0	0
6	Plant Protection	6	147	20	167
7	Fisheries	0	0	0	0
8	Agricultural Extension	9	215	49	264
9	Agro-forestry	0	0	0	0
10	Soil Fertility and Management	0	0	0	0
11	Production of input at site	0	0	0	0
	Total	32	641	259	900

B. Off Campus Training :

Sr. No.	Thematic Area	No. of Courses	Participants		
			Male	Female	Total
1	Crop Production	7	143	28	171
2	Horticulture	6	101	43	144
3	Animal Science	7	146	11	157
4	Home Science	0	0	0	0
5	Agricultural Engineering	0	0	0	0
6	Plant Protection	8	193	6	199
7	Fisheries	0	0	0	0
8	Agricultural Extension	3	60	9	69
9	Agro-forestry	0	0	0	0
10	Soil Fertility and Management	0	0	0	0
11	Production of input at site	0	0	0	0
	Total	31	643	97	740

C. Consolidated table (On and Off Campus Training) :

Sr. No.	Thematic Area	No. of Courses	Participants		
			Male	Female	Total
1	Crop Production	15	345	52	397
2	Horticulture	10	178	89	267
3	Animal Science	11	146	107	253
4	Home Science	1	0	24	24
5	Agricultural Engineering	0	0	0	0
6	Plant Protection	14	340	26	366
7	Fisheries	0	0	0	0
8	Agricultural Extension	12	275	58	333
9	Agro-forestry	0	0	0	0
10	Soil Fertility and Management	0	0	0	0
11	Production of input at site	0	0	0	0
	Total	63	1284	356	1640

(D) Vocational Training Programme for Rural Youth :

Crop/Enterprise	Date	Title of the training programme	Identified Thrust area	Duration in days	Number of other participants													
					General			SC/ST			Total							
					M	F	Total	M	F	Total	M	F	Total					
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(E) Sponsored Training Programmes :

Title	Duration	Number of other participants General			Number of SC/ST Participants			Total number of participants			Sponsoring Agency
		M	F	Total	M	F	Total	M	F	Total	
Crop production, Plant Protection, Horticulture, LPM, Agri. Extension and Field visit of demonstration unit	89 (No. of Trainings)	239 3	179 5	4188	00	0 0	00	239 3	179 5	4188	ATMA

3.5 Extension programmes (including activities of FLD Programmes)

To work as knowledge resource centre of agricultural technologies for supporting initiatives of public, private and voluntary sector to improve agricultural economy of the district, Krishi Vigyan Kendra, Nana Kandhasar conducts various extension activities like field day, method demonstration, field visit, exposure visit, awareness camp, celebration of soil health day, farmers day etc in collaboration with line departments. These activities create awareness among rural communities on various issues of farmers regarding agriculture and allied fields.

Sr. No.	Activities	No. of programmes	No. of farmers	No. of Extension Personnel	Total
1	Field Day	13	407	07	481
2	Kisan Mela	3	4030	17	4050
3	Kisan Gosthi	2	257	5	264
4	Scientists' visit to farmers field	42	715	9	766
5	Animal health camps	1	127	4	132
6	Group discussions	3	45	3	51
7	Film Show	40	2324	10	2374
8	Lecture Delivered	221	9425	15	9661
9	Extension literature distribution	32	7918	5	7955
10	International Women Day	01	55	04	60
11	International Yoga Day	01	49	05	55
12	Mahila Krishi Diwas	02	182	11	195
13	Nutrition week	01	30	04	35
14	P M Kisan Sanman Nidhi Yojna	01	126	06	133

15	Swachhata Hi Sewa Diwas	01	20	05	26
16	World food day	01	72	03	76
17	Constitutional Day	02	110	06	118
18	World Soil Day	01	47	02	50
19	Kisan Diwas	01	89	07	97
20	Kisan and Vigyan Diwas	01	57	02	60
21	Swachhata Pakhwada	01	262	04	267
22	Mahila Shaktikaran Pakhwada	01	348	10	359
23	World zoonoses day	01	113	02	116
24	Tree Plantation	01	69	06	76
25	Farmer Awareness Programme	01	103	06	110
Total		375	26980	158	27567

Field day conducted on farmer's field :

Farmers Field Day	
Number	Participants
13	407

Special Events Celebrate :

Special Events Celebrated	No.	Participants
World Zoonoses Day	01	110
International Yoga Day	01	59
Mahila Krishi Diwas	02	152
World Food Day	01	72
Swachhta Hi Sewa Diwas	01	20
Constitution Day	05	192
Soil Health Day	01	47
Kisan Diwas	01	89
Kisan and Vigyan Diwas	01	57
International Women Day	01	43

Week	No.	Participants
PMKSNY	01	126
Kisan Gosthi / Tree Plantation	01	69
Gobal Potato Conclave	01	46
Vaigyanik Gosthi and Farmer awareness programme	01	103

Technology Week Celebration :

Technology week celebration	
No.	Participants
01	423

3.6 Production and supply of Technological products

3.6.A1 Seed Material:

Krishi Vigyan Kendra, Surendranagar farm produce truthful as well as breeder seeds of groundnut, sesame, Cumin and also produce planting materials of different vegetables like tomato, brinjal, Onion, Chilli and fruit crops like papaya and lime.

Year	Crop	Variety	Stage	Area (ha)	Quantity (kg)	Value (Rs.)
2019	Groundnut	GJG-31	Breeder	3.04	5290	474100
	Groundnut	GJG-31	Truthful	1.55	2410	154150
	Groundnut	GJG-9	Breeder	4.06	7080	1011750
	Groundnut	GJG-9	Truthful	2.01	1570	102080
	Sesame	Guj. Til-3	Breeder	1.1	610	132148
	Sesame	Guj. Til-3	Truthful	1.54	730	101998
	Cumin	GC-4	Truthful	0.5	400	80000
	Total				13.80	18090

3.6.A2 Plant Materials

Yeras	Name of Vegetable/Fruit crop	Variety	Quantity (No.)	Provided to No. of farmers
2019	Tomato	JT-3	2175	220
	Brinjal	GJLB-4	1725	175
		GRB-5	1125	110
	Chilli	Wadhvani Chilli	125	25
	Onion	GJRO-11	1025	30
Total			6175	560

3.6.B Technological products :

Sr. No.	Particular	Quantity	Provide to No. of farmers	Amount
1	<i>Trichoderma</i> (Kg)	16392	2104	1147440
2	<i>Beauveria Bassiana</i> (Kg)	13158	2241	1973700
3	<i>Azotobacter</i> culture (lit)	258	83	30960
4	PSB culture (lit)	240	68	28800
5	<i>Rhizobium</i> culture (lit)	79	47	9480
6	Pheromone Trap (No.)	1238	35	24760
7	Pink bollworm Lure (No.)	2086	35	41720
8	MDP	162	41	89100
9	<i>Metarhizium</i> (Kg)	271	49	40650
Total				33,86,610

3.7 Literature Developed/Published Folder/ Popular article/Research paper published

3.7.A Research Paper Published:

Sr. No.	Contribution	Year of Publication	Title	Name of Journal	Vol /Issue /Page No or Rating/ISSN/ ISBN No.
1	M. S. Chandawat , M. F. Bhoraniya, R. P Kalma and D. A Patel	2019-20	Perception of end users about effectiveness of Sawaj brand <i>Trichoderma</i>	International Journal of Farm Sciences.	4.01
2	M. S. Chandawat, M. F. Bhoraniya, R. P. Kalma and D. A. Patel	2019-20	Constraints in adoption of SAWAJ brand bio fertilizers under field condition by the farmers of Surendranagar district in Gujarat state.	Agriculture Update	4.39
3	M. S. Chandawat, M. F. Bhoraniya, R. P. Kalma, P. R. Kanani and D. A. Patel	2019-20	Adoption level of SAWAJ <i>Trichoderma</i> among farmers of Surendranagar district in Gujarat state.	Agriculture Update	4.39

3.7. B Popular Article Published :

Sr No.	Contributors	Year of publication	Title	Name Magazine	Vol /Issue /Page No
-	-	-	-	-	-

3.7. C Books/ book chapters / Manuals etc. :

Sr. No	Title of book	Title of chapter	Name of Author
-	-	-	-

3.7. D Extension literature (Leaflets/Folder) :

Sr. No.	Name of folder published	Year	Number of Prints	Authors name
-	-	-	-	-

3.7. E Any other publications which not included above : Nil**3.7. F Workshop/Seminar/Conference/Meeting/Training Attended :**

Sr. No.	Date	Name of Scientist	Title	Venue	Type
1	14/06/2019 to 16/06/2019	Mr. M. F. Bhoraniya	Annual Zonal Workshop of KVKs	ICAR0Central Coastal Agricultural Research Institute, Ela, Velha, Goa	Annual Zonal workshop
2	06/11/2019 to 26/11/2019	Dr. R. P. Kalma	Practical knowledge sharing on nutrition and value addition in commercial poultry	Centre of advanced faculty training in avian sciences, department of poultry science, veterinary college & research institute, Namakkal, Tamil nadu	Refresher course
3	03/09/2019 to 23/09/2019	D. A. Patel	Innovative Interventions For Sustainable Vegetable Production Under Changing Climate Scenario	Dr Y S Parmar University of Horticulture and Forestry Nauni0Solun (H.P)	Refresher course

3.8 Success stories/Case studies/Impact studies, if any (two or three pages' write-up on each case with suitable action photographs)

Name of KVK: Surendranagar

Title of intervention:

Crop and Variety: Chickpea and GJG-6

Name of farmer & Address: Chavada Jayeshbhai Kamabhai

Village : Rampara

Tehsil : Wadhwan

Dist : Surendranagar

Details of technology demonstrated:

1. Seed : GJG-6: 50 kg
2. *Rhizobium* Culture: 1.0 lit
3. PSB-Culture: 1.0 lit
4. *Trichoderma*: 4.0 kg &
5. *Beauveria*: 2.0 kg

Institutional Involvement: Krishi Vigyan Kendra-Surendranagar

Success Point: 25.5 per cent highest yield of chickpea obtained from improved variety GJG-6 over then local variety GG-2

Farmer Feedback:

1. It is good variety over GG-2 variety for all parameters.
2. Farmer demanded seeded varieties for irrigated conditions.
3. Average 2-3 grains per pod is found in GJG-6 variety whereas in local variety only 1-2 grains were observed.
4. In nutshell, farmers preferred GJG-6 variety due to high yielding character and prominent to wilt resistant.

Yield (q/ha)	
Demonstration	24.60
Potential yield of variety/technology	25.00 to 27.00
District average	7.30
State average	11.25

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

Practice used	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	19.60	20980	78400	57420	3.74
Demonstration	24.60	22180	98400	76220	4.44
% Increase	25.51	5.72	25.51	32.74	18.72

Grain price Rs. 4000/qui of seed

(Good quality action photographs along with caption should be placed in the write up and same should be given separately in JPEG format)



KVK scientist visit Chavada Jayeshbhai Kamabhai's chickpea crop demonstrated GJG-6 variety at Rampara village of Wadhwan taluka



Chavada Jayeshbhai Kamabhai along with progressive farmer demonstrated GJG-6 chickpea variety at Rampara village of Wadhwan taluka



Off campus training on farmer's field during chickpea crop at flowering stage



Field day on improved variety GJG-6 at growing stage of chickpea

Success story farmer oil seed - 2019

Name of KVK: Surendranagar

Title of intervention:

Crop and Variety: Groundnut and GJG-31

Name of farmer & Address: Kukadiya Vinubhai Kehabhai
Village : Bhetsuda
Tehsil : Chotila
Dist : Surendranagar

Details of technology demonstrated:

1. Seed : GJG-31: 30 kg
2. *Rhizobium* Culture: 500 ml
3. PSB-Culture: 500 ml
4. *Trichoderma*: 2.0 kg &
5. *Beauveria*: 1.0 kg

Institutional Involvement: Krishi Vigyan Kendra-Surendranagar

Success Point: 29.11 per cent highest yield of groundnut obtained from improved variety GJG-31 over then local variety GG-2.

Farmer Feedback:

- GJG-31 is higher yielder over local varieties/GG-2
- Good for pod and fodder yield
- Also gives high yield in aberrant weather situation
- At harvesting time due to late rainfall it become not pod germinate in soil
- Stem rot disease is not found in GJG-31 variety

Yield (q/ha)	
Demonstration	22.31
Potential yield of variety/technology	34.83
District average	26.16
State average	16.29

Performance of technology vis-à-vis Local check (Increase in productivity and returns)

Practice used	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	17.28	28209	87696	49551	3.10
Demonstration	22.31	29850	113223	83373	3.79
% Increase	29.11	5.82	29.11	68.26	22.36

Pod yield price Rs. 5075/qui



Field day on improved variety GJG-31 at growing stage of groundnut



Kukadiya Vinubhai Kehabhai along with progressive farmer demonstrated GJG-31 groundnut variety at Bhetsuda village of chotila taluka



Group discussion at Bhetsuda village of chotila taluka

Success story animal husbandry

Name of KVK: Surendranagar

Title: "Importance of scientific management of animals for profitable dairy farming"

Crop and animals: Cotton, Groundnut, Sesame, other seasonal crops and 3 Jaffarabadi, 12 Bunny buffaloes and 3 crossbred cows

Name of farmer & Address: Sindhav Sureshkumar Jerambhai

Village : Dholi

Tehsil : Dhrangadhra

Dist : Surendranagar



Details of technology demonstrated:

Shri. Sindhav Sureshkumar Jerambhai is commerce graduate & engaged with agriculture since last 14 years. He has 6 Acre agriculture land and cultivates cotton, groundnut, sesame and other seasonal crops & maintains 18 cows & buffalo. Under the guidance of KVK scientists in terms of training, he gained knowledge regarding scientific management of dairy animal. Initially he applies scientific management and adopted recommendations given by the scientists and he take good profit by fetching good return. He applies scientific management of animal by artificial insemination, vaccination, use of mineral mixture, and providing chopped green and dry fodder to the animals.

Institutional Involvement: Krishi Vigyan Kendra-Surendranagar

Success Point:

Previously he gets only 4 litre milk yield from cow/day & 5 to 6 litre from buffaloes/day by rearing animals in non-scientific method. He remains regular contact with scientist of Krishi Vigyan Kendra, Nana Kandhasar. At last with all the experience and lessons he gained from KVK scientist, he applied scientific approach in routine dairy animal management. With the adoption of scientific approach *Viz.* construction of pucca shed for animals, use of vaccination for prevention of diseases, use of mineral mixture, artificial insemination for breeding of animals and providing chopped green and dry fodder to the animals. At present he gets average 12 litres milk/day/cow & 13 litres milk/day/buffaloes. Total monthly income was around 165000 to 170000 in which investment and expenditure of animal feed, medicine etc were 65000-70,000. The net monthly income he got the Rs. 1, 00,000 from animal unit. He also gets Farm Yard Manure (FYM) & utilized this FYM in his farm land for agricultural production for getting higher production.

Farmer Feedback:

- Farmer said that he gets double income from rearing of animal by scientific management.



Rearing of animal in shed



Provision of chopped fodder to animals

Kitchen Garden: Helpful in diverse and nutritious diet

- 1 **Name :** Rekhaben Harjibhai Solmiya
- 2 **Village :** Morsal, Sayla, Surendranagar
- 3 **Education :** 6th Pass
- 4 **Mobile No. :** 9586734833
- 5 **Animal :** Buffalo-5, Cow-2 & Ox-2
- 6 **Area :** 2.00 ha
- 7 **Family :** 4-Member & 3 Children



Rekhaben Harjibhai Solmiya lives with a family of seven in Morsal village within Sayla block of Surendranagar district in Gujarat. Her family relies mostly on farming for their diets and livelihood. She is a woman who has been actively engaged with self-help groups. She actively participate in various training programmes organized by ATMA at KVK- Nana Kandhasar. After the training programme she understand about the importance of kitchen gardening for nutritional importance as well as income saving.

Rekhaben mentioned that prior to start of kitchen gardening her family's diet lacked diversity and consisted mostly of the crops they could grow on their farmland or what they could purchase in the market. Regarding farming, this meant mostly grains or seasonal vegetables such as eggplant. Rekhaben further noted that relying on the market for food can be costly; thus, their family could not expand their diets through the market.

Intervention and Results

A key intervention through the KVK is provide the information of year calendar of kitchen gardening and management. KVK scientist give maximum efficiencies on bio control using name based pesticides *Beauvaria* and *Trichoderma*, KVK also ensure the seed availability according to season at low price rate @ Rs 10 per packets.

Impact

According to Rekhaben, the kitchen garden has been impactful for her family and in her village. She began participating training in July of 2017. As initial batch of seeds have since grown into a beautiful, diverse, garden with fruit crops like pomegranate, sapota, guava and citrus. This garden includes green guar, bottle guard, ridge guard, bitter guard, chilli, pigeon pea (toor), eggplant, green leafy vegetable, tomatoes and cabbage etc. Rekhaben proudly claimed that the foods grown in the garden were being utilized in recipes within their home. Additionally, she said the quantity was more than sufficient for the foods to be distributed equally for the whole family. The intervention has also been successful in reducing reliance on the market.

Output

Rekhaben Stated that from the growing of kitchen gardening not only secures the nutrition point but also helps in savings about Rs. 50,000 to 60,000 per year. If this value deposit in the bank regularly for 15 years. This income helps the family for better education or organizing better social events like marriage etc.



Rekhaben Standing in her kitchen garden



KVK Scientist observe her kitchen garden

3.11 Field Activities: Number of villages adopted :

Sr. No.	Name of Village
1	Lakhchokiya
2	Bhimora
3	Rajawad
4	Sanosara
5	Hadala
6	Chorvira
7	Mangalkui
8	Dharadungari
9	Karmadh
10	Ramdevgad
11	Melapur
12	Chhatariyala

3.12 Activities of Soil and Water Testing Laboratory

Soil and water are important components of production of any crop. Effective and efficient use of both is key for sustainable agriculture. KVK, Surendranagar provide a service for soil and water testing since year 2011.

Year	Soil Samples tested	Soil Health Card issued	No of Farmers benefitted
2019	-	-	-

4. Linkage

4.1 Functional Linkage with different organization

Sr. No.	Name of the organization	Area of collaboration/ interaction
1	State department of Agriculture	Surendranagar-district
2	Dy. Director of Agriculture (Extension)	Surendranagar-district
3	Dy. Director of Horticulture	Surendranagar-district
4	Dy. Director of Animal husbandry	Surendranagar-district
5	Dy. Director of Soil Conservation	Surendranagar-district
6	Dy. Director of Social Forestry	Surendranagar-district
7	Dy. Director of Fisheries	Surendranagar-district

8	NABARD	Surendranagar-district
9	Jilla Udyog Kendra	Surendranagar-district
10	Milk Co-operative Society	Surendranagar-district
11	State bank of India (Lead bank)	Surendranagar-district
12	Doordarshan Kendra	Surendranagar-district
13	All India Radio	Surendranagar-district
14	ATMA, Surendranagar	Surendranagar-district
15	NHRDF	Surendranagar-district
16	Farmers Training Centre	Surendranagar-district
17	Information department, Surendranagar	Surendranagar-district
18	RFIS- Surendranagar	Surendranagar-district
19	AKRSP-Surendranagar	Sayla, Thangadh and Chotila-taluka
20	AFPRO-Project	Muli, Thangadh and Chotila-taluka
21	Suminter farmer producer Company	Chotila taluka
22	Cohesion Foundation Trust	Lakhtar taluka

4.2 Special programmes undertaken by the KVK, which have been financed by state Govt/ other agencies

Special Events Celebrated	No.	Participants
World Zoonoses Day	01	110
International Yoga Day	01	59
Mahila Krishi Diwas	02	152
World Food Day	01	72
Swachhta Hi Sewa Diwas	01	20
Constitution Day	05	192
Soil Health Day	01	47
Kisan Diwas	01	89
Kisan and Vigyan Diwas	01	57
International Women Day	01	43

Week	No.	Participants
PMKSNY	01	126
Kisan Gosthi / Tree Plantation	01	69
Gobal Potato Conclave	01	46
Vaigyanik Gosthi and Farmer awareness programme	01	103

4.3 Details of linkage with ATMA

Sr. No.	linkage	Area of collaboration/ interaction
1	ATMA, Chuda	Training, Demonstration, field visit
2	ATMA, Chotila	Training, Demonstration, field visit
3	ATMA, Dhrangadhra	Training, Demonstration, field visit
4	ATMA, Lakhtar	Training, Demonstration, field visit
5	ATMA, Limbdi	Training, Demonstration, field visit
6	ATMA, Muli	Training, Demonstration, field visit
7	ATMA, Patdi	Training, Demonstration, field visit
8	ATMA, Sayla	Training, Demonstration, field visit
9	ATMA, Thangadh	Training, Demonstration, field visit
10	ATMA, Wadhwan	Training, Demonstration, field visit

4.4 Details of programmes implemented under National Horticultural Mission : NIL

4.5 Nature of Linkage with National Fisheries Development Board : NIL

5. Performance of Infrastructure in KVK

5.1 Performance of Demonstration Units (Other than instructional farm) : Year 2019-2020 – Nil

5.2 Performance of instructional farm (livestock and fisheries production)

Year 2019 - Nil

6. Financial Performance :

6.1 Details of KVK Bank Accounts

Bank account Name	Name of the Bank	Location	Account Number	IFSC
Training Organizer KVK Nana Kandhasar	STATE BANK OF INDIA	Chotila	66002464030	SBIN0060104
Training Organizer KVK Revolving Fund	STATE BANK OF INDIA	Chotila	66002438769	SBIN0060104

6.2 Utilization of KVK Funds

Sr. No.	Particulars	Sanctioned	Released	Expenditure
A. Recurring Contingencies				
1	Pay & Allowances	11000000	14250103	7388648
2	Traveling allowances	59000	56714	56105
3	Contingencies	1126000	1302258	1297074
TOTAL (A)		12185000	15609075	8741827
B. Non-Recurring Contingencies				
1	Works	0	0	0
2	Equipment's including SWTL& Furniture	0	0	0
3	Vehicle (Four wheeler)	1450000	1453306	1453306
4	Library (Purchase of assets like books & journals)	0	0	0
TOTAL (B)		1450000	1453306	1453306
C. REVOLVING FUND		0	0	0
GRAND TOTAL (A+B+C)		13635000	17062381	10195133

Summery of Utilization of KVK funds

Sr. No.	Year	Opening Balance (Rs.)	Income(Rs.)	Expenditure (Rs.)	Closing Balance (Rs.)
1	2019-20	3427381	13635000	10195133	6867248

6.3 Status of revolving funds

Year	Opening balance as on 1st April	Income during the year	Expenditure	Net balance
2005-06	100000	-	-	100000
2006-07	100000	73778	15709	158069
2007-08	158069	360622	331160	187531
2008-09	187531	287137	187888	286780
2009-10	286780	624618	100011	811387
2010-11	811387	171380	51	982716
2011-12	982716	677483	512461	1147738
2012-13	1147738	903804	307645	1743897
2013-14	1743897	1015204	437161	2321940
2014-15	2321940	733361	544037	2511264
2015-16	2511264	1573458	631127	3453595
2016-17	3453595	3291526	2458926	4286195
2017-18	4286195	6962898	5674258	5574835
2018-19	5574835	5422216	4284740	6712311
2019-20	6712311	4823057	3295197	8240171
2020-21	8240171	1506444	558099	9188516

7. Other Project

7.1 ATIC (Agricultural Technology Information Centre):

Krishi Vigyan Kendra, Surendranagar also conduct trainings and FLDs under ATIC programme which is famously know as Single Window System in agricultural extension.

7.1.1 Training under ATIC:-

Year	No. of Training	Participants		
		Others	SC/ST	Total
2019-20	12	228	47	275

7.1.2 Critical input provided to farmers during the period under ATIC :

Year	Crop	Input	Total Area (ha)	Total Number of Demonstrations
2019	Sesame	1. GT-4 2. <i>Beauveria</i> & 3. Sulphur	16	40
	Cotton	1. GC Hy-8 2. <i>Azotobacter</i> 3. PSB 4. <i>Beauveria</i> 5. Micromix Grade -IV	16	40
	Cumin	1. GC-4 2. <i>Trichoderma</i>	16	40
	Wheat	1. GW-463 2. <i>Azotobacter</i> 3. PSB	16	40

7.1.3 Performance of front-line demonstration of ATIC in *Kharif/ & Rabi* season:-

Year	Crop	Variety	Farmers	Area (ha.)	Demo. Yield Qtl/ha			Yield of local Check qtl./ha	Yield Increase (%)	Average Cost of cultivation (Rs./ha)		Average Gross Return (Rs./ha)		Average Net Return (Profit) (Rs./ha)		BC Ratio (Gross Return / Gross Cost)
					H	L	A			Demo	Check	Demo	Check	Demo	Check	
2019-20	Sesame	GT-4	40	16	06.28	04.20	06.10	05.60	08.92	14570	13550	67100	61600	52530	48050	4.61
	Cotton	GCH 10 Bt	40	16	28.40	18.80	23.8	21.20	12.26	42190	41275	119000	106000	76810	64725	2.82
	Cumin	GC-4	40	16	07.20	03.80	06.80	06.20	09.67	28425	28225	81600	74400	53175	46175	2.87
	Wheat	GW- 366	40	16	42.50	22.60	33.50	30.20	10.92	24960	24460	60300	54360	35340	29900	2.41

7.2 Activities done under NFSM:

Sr. No	Season	Crop	Technology for demonstration	Component	Area (ha.)	No. of Demo.
1	Rabi-2019-20	Chick pea	Improve Variety and bio agents	Variety GJG-3: 25 kg, <i>Rhizobium</i> Culture: 0.5.0 lit, PSB-Culture: 0.5 lit, <i>Trichoderma</i> : 2 kg & <i>Beauveria</i> : 1 kg	20	50

7.2. Performance of front-line demonstration

Year	Crop	Variety	Farmers	Area (ha.)	Demo. Yield Qtl/ha			Yield of local Check qtl./ha	Yield Increase (%)	Average Cost of cultivation (Rs./ha)		Average Gross Return (Rs./ha)		Average Net Return (Profit) (Rs./ha)		BC Ratio (Gross Return / Gross Cost)
					H	L	A			Demo	Check	Demo	Check	Demo	Check	
2019-20	Gram	GJG-3	20	50	29.50	15.00	20.24	16.37	23.63	22580	21380	80950	65480	58370	44100	3.59

7.3 Activities done under NMOOP (National Mission On Oilseeds And Oil Palm) :

Sr. No.	Season	Crop	Component	Area (ha)	No. of Demo.
1	<i>Kharif</i>	Groundnut	G'nut Seed: GJG-31- 30 kg, Rhizobium-500 ml, Trichoderma-2 kg, Beauveria-1 kg, Neem oil-500 ml & Sticker-500 ml	20	50

7.3 Performance of front-line demonstration

Crop	Variety	Farmers	Area (ha.)	Demo. Yield Qtl/ha			Yield of local Check qtl./ha	Yield Increase (%)	Average Cost of cultivation (Rs./ha)		Average Gross Return (Rs./ha)		Average Net Return (Profit) (Rs./ha)		BC Ratio
				H	L	A			Demo	Check	Demo	Check	Demo	Check	
Groundnut	GJG-31	50	20	24.00	8.45	20.24	16.37	23.63	22180	20980	80950	65480	58770	44500	3.65

7.4 Mera Gaon Mera Gaurav (MGMG):

7.4.1 Name of scientist

Team Formed	Name Of Scientist	No. of villages covered
1	Mr. M. F. Bhoraniya	10
	Mr. D. A. Patel	
	Mr. A. K. Vala	
2	Dr. B. C. Bochalya	
	Dr. R. P. Kalma	
	Mr. M. N. Patel	

7.4.2 Name of Villages

Sr. No.	Name of village	Sr. No.	Name of village
1.	Doliya	6.	Dheduki
2.	Ratanpar	7.	Lakhanka
3.	Magharikheda	8.	Sangani
4.	Nana Kandhasar	9.	Vijaliya
5.	Shapar	10.	Gadhad

7.4.3 Activities in MGMG

Activities	2019-2020	
	No.	Farmer Participated & benefitted
Visit to village by teams	13	273
Interface meeting/Goshthies	11	231
Training Organized	09	189
Demonstrations conducted (Crops)	04	160
Mobile based advisories (No. Of messages)	03	417
Literatures support provided (No.)	07	375
Awareness Supported (No.)	06	675
Other (Celebration of Day)	08	329

8 Special Achievements/Award/Rewards etc.

8.1 Krishi Vigyan Kendra, JAU, Nana Kandhasar was awarded with the “Best Exhibition Stall Award”

Krishi Vigyan Kendra, JAU, Nana Kandhasar was awarded with the “Best Exhibition Stall Award” in category of agricultural research, development & extension by the hands of Hon. Dr, Mahendra Munjpara, member of parliament, Surendranagar. The programme “Destination Gujarat 2019” mega exhibition was organized by Sansa Foundation, Delhi from 18th to 20th December, 2019 at Surendranagar, Gujarat to provide formal platform to farmers & rural youth to interact with eminent personalities of various sectors like science & technology, health care, agriculture, information technology, power & textile, women empowerment and education.



Scientists of Krishi Vigyan Kendra, JAU, Nana Kandhasar receiving “Best Exhibition Stall Award” by the hands of Hon. Dr, Mahendra Munjpara, member of parliament, Surendranagar

8.2 Scientist of Krishi Vigyan Kendra, JAU, Nana Kandhasar awarded with the Dr. APJ Abdul Kalam National award



Scientist of Krishi Vigyan Kendra, JAU, Nana Kandhasar receiving Dr. APJ Abdul Kalam National award

8.3 Scientist of Krishi Vigyan Kendra, JAU, Nana Kandhasar awarded with the Dr. APJ Abdul Kalam lifetime achievement award



Scientist of Krishi Vigyan Kendra, JAU, Nana Kandhasar receiving Dr. APJ Abdul Kalam lifetime achievement award

9. Most significant achievements of KVK :

9.1 Use of *Beauveria bassiana* for control of pink bollworm and sucking pest in cotton crop by farmers of Surendranagar district

Key Challenge:-

- In Surendranagar district, cotton is major crop grown in *kharif* season and sown in approximately 2.75 to 3.25 lakh hectare area under Bt. Cotton.
- Since last two years, early and heavy infestation of pink bollworm in Bt. cotton crop was observed and farmers of Surendranagar district were frightened to think about the loss caused by pink bollworm.
- Farmers were not face this kind of infestation earlier and thus not fully aware about the control of pink bollworm in cost effective and environment friendly manner.
- Government officials claimed that the menace can be contained with chemical treatment. “The treatment of insecticides will cost farmers an additional 2,000-2,500 per acre. This will add to their cost of cultivation. The remedy is available and this menace can be contained,” said a senior agriculture official from Rajkot district. (Pink bollworm hits cotton in Gujarat, Maharashtra, The Hindu, daily news paper, August, 8, 2017).
- CICR deputed a team of scientists to survey the regions and collect samples for analysis. The team reported extensive occurrence of rosette flower symptoms that are caused due to pink bollworm damage. The damage ranged between 0-80% on Bollgard II at Bharuch, Vadodara, Anand, Bhavnagar, Amreli, Junagadh, Rajkot, Surendranagar and Ahmedabad districts.(Pink Bollworm Strikes Bt-Cotton, Cotton Statistics and News, Cotton Association of India, 1st December, 2015)
- Farmers and traders fear an additional loss in cotton and production by 20 per cent from the pink bollworm infestation in the fields, thereby restricting arrivals and pushing up prices ahead of the new crop year which begins in late September. (After

floods, pink bollworm infestation affects cotton crop in Gujarat, Business Standard, 14/08/2017.)

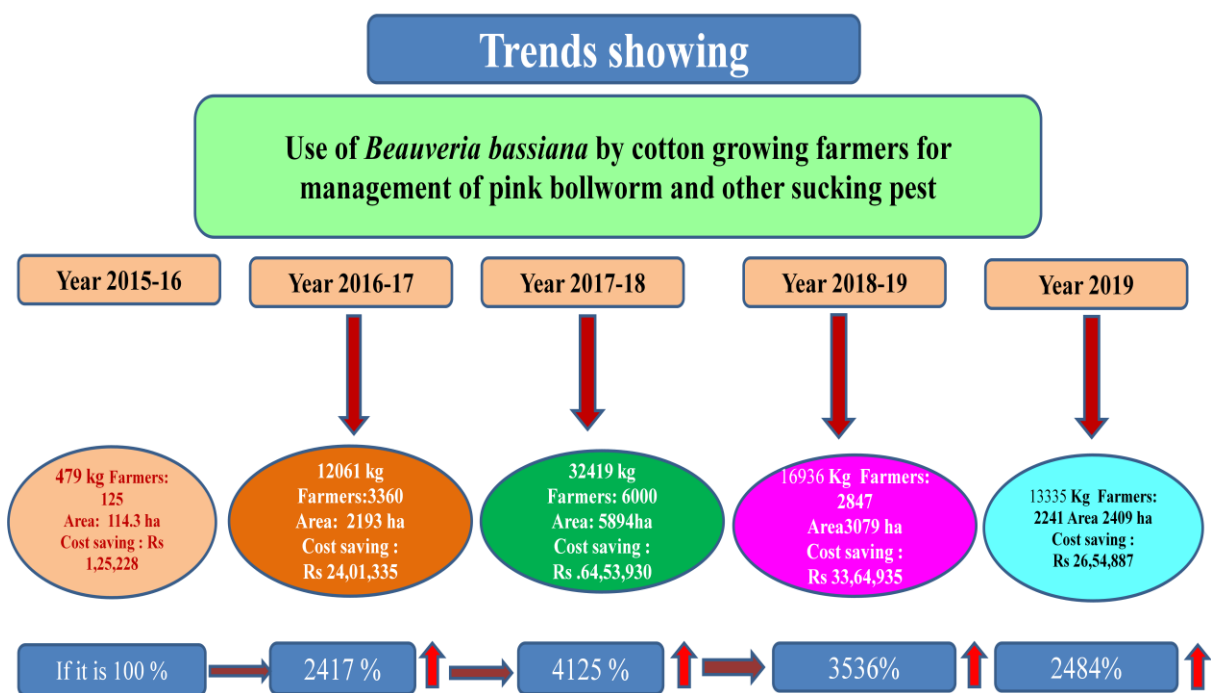
- Pink boll worm populations from Gujarat developed resistance to Cry1Ac and Cry2Ab together. Therefore the larvae are able to survive on BG-II.
- Chaos was continue until and unless KVK, JAU, Surendranagar undertaken massive campaign for control of pink bollworm by adopting scientific approach in integrated manner. We promoted use of *Beauveria bassiana* for effective control as is low cost technology.

Old Practices :

- Excess and injudicious use of chemical insecticides for control of Pink Bollworm and other pest of cotton.
- Application of chemical insecticides without knowing whether it is recommended for the control of pink bollworm or not was in practice.
- Due to this, cost of cultivation become high and control of pest still stand as big problem due to faulty or inappropriate selection of chemical insecticides for control of pink bollworm in cotton crop. Ultimately resulting in crop loss or total crop failure.
- Early sowing of Bt. Cotton (In the month of April) and late harvesting (till March April) of the same was in practice which attract pink bollworm's early infestation and sustaining for a long time in crop field.
- Farmers kept cotton stalks of previous year crop in which pink bollworm pupa hosted till the new crop arrival and a major reason for sustaining pink boll worm in Bt cotton crop.
- Farmers were not aware about the integrated management of pink bollworm in Bt cotton crop.

Quantification of impact of use of *Beauveria bassiana* on management of pink bollworm in Bt Cotton crop

Sr. No.	Spray	Average cost of input incurred farmers/ha/spray (Rs.)		Approximately cost saving due to use of <i>B. bassiana</i> over chemical insecticide/ha/spray	Per cent saving cost <i>B. bassiana</i> over chemical pesticide/ha/spray
		<i>Beauveria bassiana</i>	Chemical insecticides		
1.	I- Spray	225*	540* (Monocrotophos + Acephate)	315	58
2.	II-Spray	300*	660* (Profenophos + Imidachloprid)	360	55
3.	III-Spray	300*	720* (Fipronil+ Diamethoate)	420	58
Total		825	1920	1095	



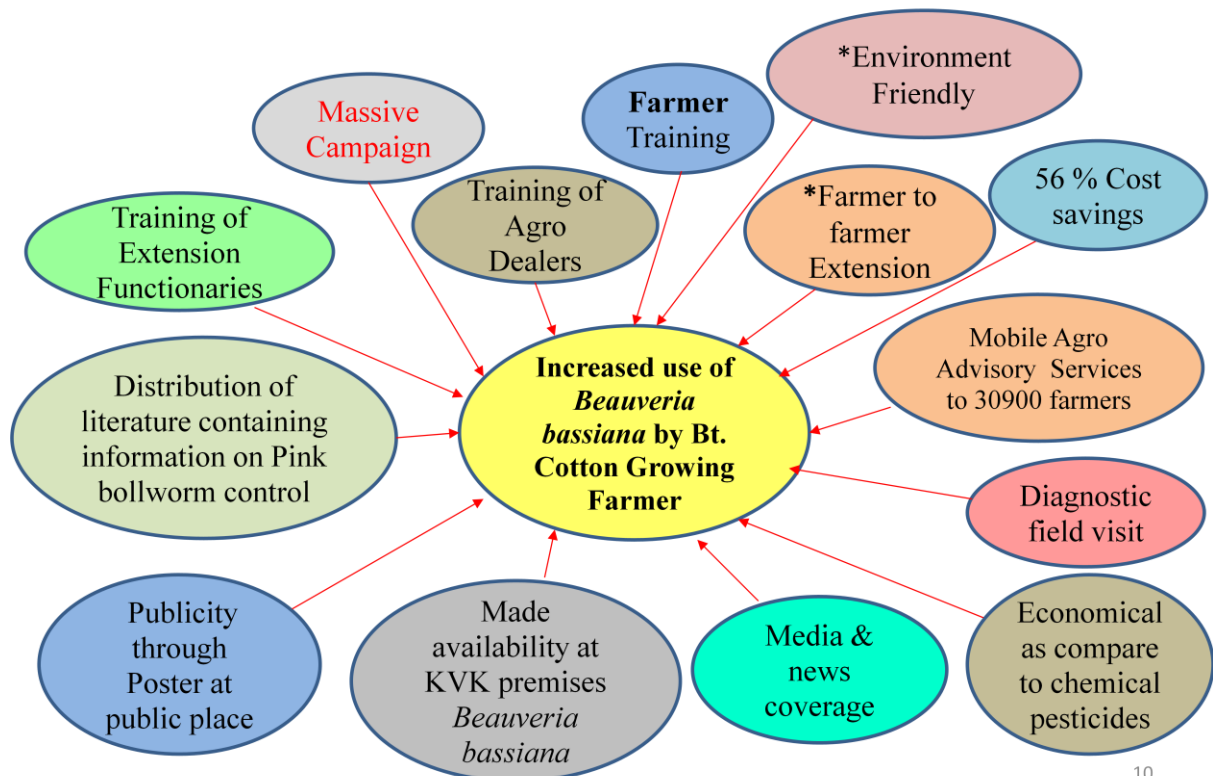
Year	KVK Provide to Faarmers (Kg)	Number of Farmers <i>Beauveria</i> used	Area (ha)	Use of <i>Beauveria</i> Increase (%)	Cost saving over chemical insecticides (Rs)
2015-16	479	125	114.3	100	1,25,228
2016-17	12061	3360	2193	2518	24,01,335
2017-18	32419	6000	5894	6768	64,53,930
2018-19	16936	2847	3079	3536	33,64,935
2019-20	13335	2241	2409	2484	26,54,887

In different villages of Surendranagar district, approximately 61895 kg *Beauveria bassiana* ("Sawaj *Beauveria*") was purchased from KVK during last two year. If above three spray was assumed to be done with *Beauveria bassiana* in comparison with chemical spray, approximately Rs. 1,23,22,731 (Rs one crore twenty three lakh twenty two thousand seven hundred thirty one) net saving was observed.

(If 5.5 kg of *B. bassiana* used for three spray then $61895/5.5 \times 1095 = 1,23,22,731$ /-, here 61895 kg is quantity of total *B. bassiana* used by farmers, Rs. 825 incurred for purchase of every 5.5 kg *Beauveria bassiana* and Rs. 1095 is average overall total saving/ha if three spray done with *B. bassiana*).

While 8-10 per cent increase in production due to use of timely and appropriate spray of pesticides, is a additional benefit. If in it happened in 11280 ha then, over all 26401 quintal increased production was taken by farmers as compare to non beneficiary farmer.

How large adoption of Sawaj *Beauveria*



10

Outcome and Impact :

1. Cost saving of more than 55 % as compare to chemical pesticides. Approximately Rs. 1,23,22,731 saved by the cotton growing farmers who use *Beauveria bassiana* for management of pink boll worm and sucking pest in Bt. Cotton.
2. Apart from cost saving, 8 – 10 % increase in production of Bt cotton beneficiary farmers due to timely use and appropriate measures taken due to guidance of KVK scientists.
3. At least 31,979 litter hazardous chemical insecticide replaced by use of *Beauveria bassiana* by the Bt cotton growing farmers of Surendranagar district.
4. *Beauveria bassiana* is environment friendly and safe to use for human health as well as safe to animal and other creature.

The key to the success of Krishi Vigyan Kendra :

- KVK, Surendranagar encouraged and promoted *Beauveria bassiana* because it is cheap, economical and providing effective result in managing pink bollworm and sucking pest in Bt. Cotton crop.
- Farmers to farmer extension is key to reach to more/ larger number of farmers in all three MSTI as purchasing of *Beauveria basiana*, *Trichoderma* and selling of chickpea seed of farmers only possible due to integrated approach of extension and in this farmer to farmer extension was in centre of all success.
- Farmer of Karmad only got success in selling 900 quintal of their chick pea seed to hundreds of other farmers of district as well as out of district was indicating that if

farmer trust on organization and technology and if technology is good and economical, farmers are ready to adopt technologies and to expand it to other farmer also.

- KVK is promoting bio pesticides and bio agent are economical to farmers.

9.2 Use of Trichoderma in cotton, groundnut and cumin crop by farmers of Surendranagar District

Key Challenge:-

- In Surendranagar district, more than 60 per cent area of *kharif* crops is occupied by cotton. In the *kharif* season, out of total area under cotton crop, more than 80 % of area covered by Bt. cotton cultivation. More than 40% area of *kharif* crops is occupied by groundnut.
- In recent past 4-5 years, disease infestation of wilt in cotton, stem rot in groundnut and wilt in cumin crops was observed . Heavy loss occur due to *Fusarium* wilt in cotton, Stem rot (*Sclerotium rolfsii*) in Groundnut and *Fusarium* wilt in cumin crop .
- Farmers were not face this kind of infestation earlier and thus not fully aware about the control of wilt in cost effective and environment friendly manner.
- Fusarium wilt (*Fusarium oxysporum*) Fusarium wilt is now an important constraint to sustainable cotton production. Wet weather conditions (temperature above 23°C and relative humidity exceeding 85%) are particularly conducive to disease development. Disease incidence can be higher in plants with injured tissues (for example, plants damaged by Intercultural operations). Plants can be affected by the disease at any stage during the season. The vascular tissue of infected plants exhibits a brown/chocolate discoloration through the main stem. Infected water-conducting stem tissues become inactive, causing wilted foliage. Plant death, wilting, yellowing and defoliation are typical of disease symptoms. Leaves turn yellow between veins and eventually shed to leave bare stems. Once the fungus has colonised the plant (diagnosis is confirmed by splitting the stem to reveal dark brown), it most likely causes the death of the host. There is no commercially viable way to eradicate the disease once established (apart from soil fumigation, which is excessively expensive).
- Chaos was continue until and unless KVK, JAU, Surendranagar undertaken massive campaign for control of wilt by adopting scientific approach in integrated manner. We promoted use of **Use of Trichoderma** in cotton for effective control.

Soil-borne diseases of field crops :

- Groundnut (*Arachis hypogaea* L.), cumin (*Cuminum cyminum*) and cotton (*Gossypium hirsutum*) is widely cultivated in Surendranagar district. Cultivation of crops offers health and economic benefits but one of the most important challenges faced by growers is the management of destructive diseases.

- Among the most devastating fungal diseases of groundnut, cumin and cotton are the soil-borne. Diseases of groundnut like stem rot (*Sclerotium rolfsii* Saccardo) and crown/collar rot (*Aspergillus niger* van Tieghem), wilt of cumin (*Fusarium oxysporum*) and wilt of cotton (*Fusarium oxysporum* f. sp. *vasinfectum*) cause substantial loss to plant stand and yield. Combined yield losses due to incidence of the diseases in range from 20-50 %.
- Many fungicides are available for management of fungal diseases. But application of fungicides throughout the season puts additional burden on the growers. Alternative disease management options like cultural practices, planting resistant cultivars, use of bio control agents, etc. can be useful in management of diseases by reducing the frequency of application of fungicides.

Old Practices :

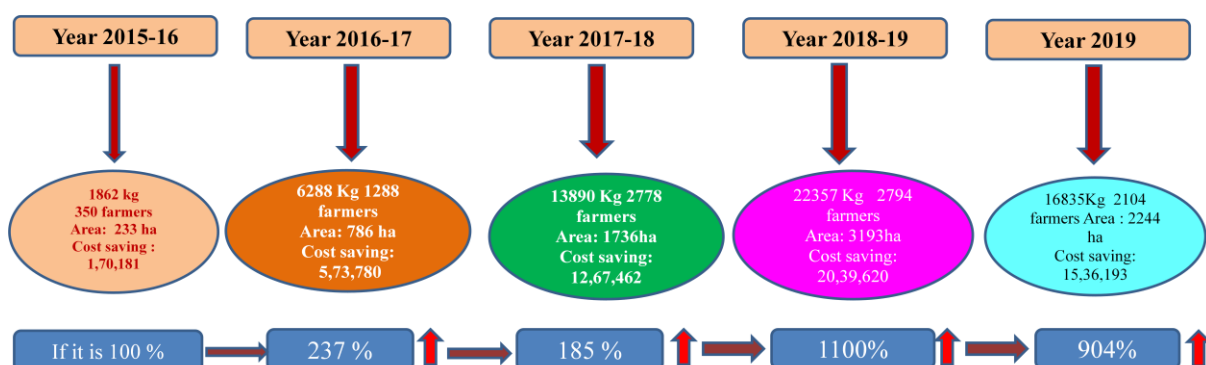
- Excess and injudicious use of chemical fungicides for control of soil born diseases in cotton, groundnut and cumin.
- Use of chemical fungicides without knowing whether it is recommended for the control measures.
- Once infestation occurred, the control of disease infestation become highly costlier thus automatically the cost of cultivation become high. Many times faulty or inappropriate selection of chemical fungicides for control of wilt in cotton, stem rot in groundnut and wilt in cumin crops resulting crop loss or crop failure.
- Farmers were not aware about the integrated management of these diseases of the crops.

Use of Gir Sawaj *Trichoderma*:

Trichoderma is used in protecting crops such as cauliflower, cotton, tobacco, soybean, sugarcane, sugar beet, eggplant, red gram, bengal gram, banana, tomato, chillies, potato, citrus, onion, groundnut, peas, sunflower, brinjal, coffee, tea, ginger, turmeric, pepper, betel vine, cardamom. Trichoderma is a potent bio control agent and used extensively for soil born diseases. It has been used successfully against pathogenic fungi belonging to various genera, viz. *Fusarium*, *Phytophthora*, *Sclerotium* etc. Trichoderma fungi produce a rich mixture of antifungal enzymes, including chitinases and β -1, 3glucanases. These enzymes are synergistic with each other, with other antifungal enzymes, and with other materials. The genes encoding the enzymes appear useful for producing transgenic plants resistant to diseases and the enzymes themselves are beneficial for biological control and other processes.

Trends showing

Use of *Trichoderma* farmers for management soil born diseases



4

Year	KVK Provide to Faarmers (Kg)	Number of Farmers <i>Trichoderma</i> used	Area (ha)	Use of <i>Trichoderma</i> Increase (%)	Cost saving over chemical fungicides (Rs)
2015-16	1862	350	233	100	1,70,181
2016-17	6288	1288	786	338	5,73,780
2017-18	13890	2778	1736	746	12,67,462
2018-19	22357	2794	2794	1201	20,39,620
2019 -20	16835	2104	2244	904	15,36,193

Highlights / positive feature of the *Trichoderma* :

Sr. No.	Drenching	Average cost of input incurred farmers/ha/drench (In Rs.)		Approximately cost saving due to use of <i>Trichoderma</i> over chemical pesticide/ha/drench	Per cent saving cost <i>Trichoderma</i> over chemical pesticide/ha/drench
		<i>Trichoderma</i>	Chemical pesticides		
1.	I- Drenching	280*	540* (Mencozeb + Carbendazim)	260	48
2.	II- Drenching	280*	750* (Copper Oxychloride)	470	62
Total		560	1290	730	56

Note: *This includes only cost of particular input used for drenching. This not included labour cost and other cost are static in both the cases.

Outcome and Impact :

1. Sawaj Brand *Trichoderma* is very cheap, economical and cost effective for soil born fungal diseases as compare to other private products available in the market including chemical fungicides.
2. It is environment friendly.
3. Easily available at KVK and other University Centres. Farmers even purchase it when they are coming to KVK to participate in training and other extension programmes.
4. Easy to use and effective result of *Trichoderma* , self motivate to use it to their fields

9.5 Details of Electricity Connection at KVK, JAU, Nana Kandhasar :

Sr. No.	Name Connection	Meter number	Consumer Number
1	Training Organizer, laboratory	8215278	27854/00198/7
2	Training Organizer, Hostel	PGST00780632	27854/00191/0
3	Asst. Res. Sci., DFRS (Old Office)	DDU3764296	27854/00033/6
4	E-Type Quarter-1	PGST02502490	27854/00192/8
5	Training Organizer, D- Type Quarter-1	27800217083	27854/00193/6
6	Training Organizer, D-Type Quarter-2	193507	27854/00194/4
7	Training Organizer, C-Type Quarter-1	PGST01225878	27854/00195/2
8	Training Organizer, C-Type Quarter-2	PGST1440976	27854/00197/9
9	Training Organizer, C-Type Quarter-3	27800217087	27854/00196/0
10	Suki Kheti Sansodhan Kendra New Connection-20 HP	158194	27854/00884/1
11	Asst. Res. Sci. Dry Farming Old Connection- 30 HP	Yearly	27854/00151/0

-----X-----X-----