Tamil Nadu Veterinary and Aimal Sciences University
Directorate of Extension Education
ICAR-Krishi Vigyan Kendra
VC&RI campus, Namakkal

Annual Progress Report Summary

1.Training Programmes

Clientele	No. of Courses	Male	Female	Total participants
Farmers & farm women	205	3881	3094	6975
Rural youths	35	792	314	1106
Extension functionaries	18	488	285	773
Sponsored Training	15	183	232	415
Vocational Training	-	-	-	-
Total	273	5344	3925	9269

2.Frontline demonstrations

Enterprise	No. of Farmers	Area (ha)	Units/Animals
Oilseeds	150	60	-
Pulses	100	40	-
Cereals	-	-	-
Vegetables	60	5.5	-
Other crops	55	21.4	-
Total	365	126.9	-
Livestock & Fisheries	30 5	1.00	20 dairy Animals 60 Small Ruminants 250 poultry birds & 2500 J.quail 60000 Shrimp & 20000 GIFT Tilapia
Other enterprises	-	-	-
Total	400	127.9	82830
Grand Total	**400**	**127.9**	**82830**

3.Technology Assessment & Refinement

Category	No. of Technology Assessed & Refined	No. of Trials	No. of Farmers
Technology Assessed			
Crops	6	55	55
Livestock	1	10	10
Various enterprises	-	-	-
Total	**7**	**65**	**65**
Technology Refined			
Crops	-	-	-
Livestock	-	-	-
Various enterprises	-	-	-
Total	-	-	-
Grand Total	**7**	**65**	**65**

4.Extension Programmes

Category	No. of Programmes	Total Participants
Extension activities	763	27282
Other extension activities	176	25000
Total	**939**	**52282**

5.Mobile Advisory Services

Name of KVK	Message Type	Type of Messages						
		Crop	Livestock	Weather	Marketing	Aware-ness	Other enterprise	Total
KVK, Namakkal	Text only	11	16	132	11	18	-	188
	Voice only	-	-	-	-	-	-	-
	Voice & Text both	-	-	-	-	-	-	-
	Total Messages	**11**	**16**	**132**	**11**	**18**	**-**	**188**
	Total farmers Benefitted	**175**	**42**	**5325**	**22**	**113**	**-**	**5677**

6.Seed & Planting Material Production

	Quintal/Number	Value Rs.
Seed (q)	232.09	7148165
Planting material (No.)	10486& 32700 setts	863971
Bio-Products (kg)	45 no. of bio product	520045
Livestock Production (No.)	27630	405307
Fishery production (No.)	1800	5750

7.Soil, water & plant Analysis

Samples	No. of Beneficiaries	Value Rs.
Soil	600	81225
Water	171	28315
Plant	-	-
Total	771	109540

8.HRD and Publications

Sr. No.	Category	Number
1	Workshops	6
2	Conferences	3
3	Meetings	15
4	Trainings for KVK officials	21
5	Visits of KVK officials	
6	Book published	-
7	Training Manual	02
8	Book chapters	-
9	Research papers & popular articles	11 & 51
10	Lead papers & Reports	- & 15
11	Seminar papers & technical booklets	06 & 09
12	Extension folder	21
13	Proceedings & KVK newsletter	- & 2
14	Award & recognition	03
15	On going research projects (NICRA, NFSM, NMOOP)	03

DETAIL REPORT OF APR-2017-18

1. GENERAL INFORMATION ABOUT THE KVK

1.1. Name and address of KVK with phone, fax and e-mail

Address	Telephone		E mail
	Office	Fax	
ICAR-KRISHI VIGYAN KENDRA Veterinary College and Research Institute Campus, Namakkal - 637 002 Tamil Nadu.	04286 - 266345, 266650	-	kvk-namakkal@tanuvas.org.in, kvk.Namakkal@icar.gov.in Website : www.namakkalkvk.com

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

Address	Telephone		E mail
	Office	FAX	
Tamil Nadu Veterinary and Animal Sciences University Madhavaram Milk Colony, Chennai - 600 051.	044 -25551584	044- 25551585	registrar@tanuvas.org.in Website : www.tanuvas.ac.in

1.3. Name of the Programme Coordinator with phone & mobile No

Name	Telephone / Contact		
	Residence	Mobile	Email
Dr.N.Akila	45A Kongu Nagar, Vengamedu, Karur – 639 006	97908 85431 89039 32591	akila2528@gmail.com

1.4. Year of sanction: 2004

1.5. Staff Position (as on 31th March, 2018)

Sl. No.	Sanctioned post	Name of the incumbent	Design-ation	Discip-line	Pay Scale (Rs.)	Present basic (Rs.)	Date of joining	Perman-ent /Temp-orary	Category (SC/ST/ OBC/ Others)
1	Senior Scientist and Head	Dr.N. Akila	Senior Scientist and Head	Animal Science	37400-67000 + 10000	44850+10000	16.12.15	Permanent	OBC
2	Scientist	Dr.C.Sharmila Bharathi	Scientist	Horticulture	15600-39100 + 8000	29000+8000	25.05.06	Permanent	OBC
3	Scientist	Dr. P.Murugan	Scientist	Agronomy	15600-39100 + 7000	25910+7000	23.06.17	Permanent	OBC
4	Scientist	Th.C.Sankar	Scientist	Agricultural Entomology	15600-39100 +6000	19050+6000	24.11.15	Permanent	SC
5	Scientist	Dr.M.Jothilakshmi	Scientist	Animal Science	15600-39100 +6000	19050+6000	01.06.16	Permanent	OBC
6	Scientist	Dr. S.Sathya	Scientist	Soil Science	15600-39100 +6000	20370+6000	18.11.15	Permanent	OBC
7	Scientist	Dr.S.Paulpandi	Scientist	Fisheries	15600-39100 +6000	16920+6000	18.11.15	Permanent	SC
8	Farm Manager	Tmt. M. Daisy	Farm Manager	Agronomy	35900-113500	52600	25.05.06	Permanent	SC
9	Superintendent cum Accountant	Tmt.G.Manimekalai	Superintendent cum Accountant	--	36900-116600	42700	01.03.18	Permanent	OBC
10	Programme Assistant (Technical)	Th.S.Shrinivasan	Programme Assistant (Technical)/ Assistant	--	20600-65500	34100	16.05.12	Permanent	OBC
11	Programme Assistant (Computer)	Vacant	-	-		-	-	-	-
12	Junior Stenographer	Th.N.Sundararajan	Stenographer Gr.III	--	20600-65500	24600	19.09.11	Permanent	OBC
13	Driver (Tractor)	Th.S. Kalaimani	Driver (Spl.Gr.)	--	35900-113500	54200	06.07.09	Permanent	OBC
14	Driver (Jeep)	Th. T.Puttasamy	Driver	--	19500-62000	29500	10.02.14	Permanent	OBC
15	Supporting staff	Tmt. M.Nagammal	Supporting staff	--	15700-50000	26800	14.09.05	Permanent	OBC

16	Supporting staff	Th.M.Periyasamy	Supporting staff	--	15700-50000	21700	20.11.12	Permanent	SC

1.6. Total land with KVK (in ha) :

S. No.	Item	Area
1	Under Buildings	1250 Sq.m
2.	**Under Demonstration Units** a) **Goat Shed** Slatted floor shed for goat Slatted floor shed for sheep Shed for kids and lambs b) **Dairy Shed** c) **Desi bird shed** Deep litter system Cage for Chicks Semi-intensive shed for alternate poultry d) Piggery shed e) Ornamental fish hatchery f) Fish pond - 1 no. (cement)	 57.50 Sq.m 42.00 Sq. m 57.80 Sq.m 52.03 Sq.m 33.70 Sq.m 34.80 Sq.m 193.4 Sq.m 23.23 sq. m 40.00 Sq.m 2500 Sq.ft
3.	**Under Crops** **1. Total cropped area** (Agricultural and Horticultural crops) **2. Total non cropped area** (using for livestock grazing land and tree planting**)**	 7.40 ha. 12.6 ha
4.	**Other units** a) Shade net- Azolla Production unit b) Shade net- poly bag nursery (Fruit and vegetable saplings) c) Coconut nursery d) Mushroom unit e) Vermi compost unit (2 nos.) f) Automatic Weather station g) Honey bee unit h) Biocontrol production unit	 121.38 Sq.m 198.00 Sq.m. 40.00 Sq.m. 6.50 Sq.m 60.00 Sq.m - 3 nos. -

1.7. Infrastructural Development:

A.Buildings

S. No.	Name of building	Source of Funding	Stage		
			Complete		
			Completion Date	Plinth area (Sq.m)	Expenditure (Rs.)
1.	Administrative Building	ICAR	29.10.2008	550	45.13
2.	Farmers Hostel	ICAR	29.10.2008	300	30.52
3.	Staff Quarters	ICAR			
	1. Supporting Staff		29.10.2008	100	44.35
	2.Assistant Professor			300	
4	Demonstration Units	ICAR			
	1. Goat unit		09.10.2009	57.8	2.98
	2. Desi bird unit		09.10.2009	66.26	2.98
5	Fencing	ICAR	09.06.2008	980 RM	3.13
6	Compound wall	ICAR	03.03.2008	174 M	4.70
7	Bore well (Farm)	ICAR	22.06.2009	--	2.00
8	Energizing bore well	ICAR	29.08.2007	--	0.58
9	New bore well	ICAR	22.06.2017	--	2.00
10	Rainwater harvesting pond	NICRA	2013	-	1.00
11	Rural Bank, Agri Mart (Sales and store room) and Community Radio Station	MLA CDS, District Panchayat, ICAR TSP, TANUVAS GF	21.04.2015	163.14	88.95
12	Specialized KVK – Laboratory for animal science	ICAR	31.03.2017	350 sq.ft for lab	7.50

13	Threshing yard (Construction of drying yard) at KVK campus, Namakkal	PPP fodder	27.03.2018	30 x 30 ft	1,38,804
14	BT road (providing premix carpet over exisiting BT road from KV main entrance upto office rear side of KVK campus, Namakkal)	PPP fodder	27.03.2018	770 Sq.m	1,50,796

B.Vehicles

Type of vehicle	Year of purchase	Cost (Rs.)	Total kms. Run	Present status
Tractor	2005	4,99,997	2004.5 hrs.	Good
TVS Star city	2006	39,996	63564	Good
Honda Aviator	2009	49,925	32856	Good
Tempo Traveller (Force)	2012	(Transferred from FTC, Theni)	49347	Good
Jeep(Mahindra Bolero)	2017	737664.00	10536	Good

C) Equipments & AV aids

Sl.No.	Name of Equipments	Date of purchase	Cost (Rs.in lakhs)	Present status
1.	Computer system	31.03.2005	33414.40	In working condition
2.	Xerox machine	31.03.2005	34362.51	”
3.	HCL Laptop	30.03.2007	23680.32	”
4.	Total Mixer Ration (TMR) feed plant	31.03.2009	69031.81	”
5.	PA systems	31.03.2009	18791.93	”
6.	EPABX System	31.03.2009	31306.34	”
7.	Generator	31.03.2010	129290.14	”
8.	Power Tiller	31.03.2010	88573.50	”
9.	Brush cutter	20.03.2009	10602.25	”
10.	LCD TV	28.07.2010	10679.58	”
11.	Deep Freezer with Stabilizer	15.09.2010	13476.03	”
12.	Refrigerator 280 lt	28.07.2010	12731.17	”
13.	Ultra pure water	31.03.2011	233747.50	”
14.	UV Spectrophotometer	31.03.2011	268778.53	”
15.	Flame Photometer	30.03.2011	41052.01	”
16.	Nitrogen Analyser	31.03.2011	245325.29	”
17.	Electronic weighing balance	31.03.2011	40022.10	”
18.	Portable Carp Hatchery unit	20.03.2011	94191.21	”
19.	Laptop	21.11.2012	23545.00	”
20.	Multi functional printer	08.11.2012	59116.00	”
21.	Rotavator	31.03.2014	53796.00	”
22.	Sony LED TV	16.09.2014	59209.00	”
23.	PUSA STFR soil testing kit	16.02.2016	72500.00	”
24.	MRIDAPARIKSHAK Mini soil testing lab	27.03.2017	90300.00	”
25.	LCD projector	31.03.2017	27500.00	”
26.	CCTV camera	31.03.2017	20000.00	”
27.	Samsung LED monitor	31.03.2017	23400.00	”
28.	Desktop dell	31.03.2017	31600.00	”
29.	LCD screen logic wall mounted	31.03.2017	12850.00	”
30.	Lenova tablet	31.03.2017	17000.00	”
31.	Sony projector	31.03.2017	30750.00	”
32.	Sony Digital camera	31.03.2017	26000.00	”
33.	Desktop dell	31.03.2017	28300.00	”
34.	Laminar Air Flow	31.03.2017	71420.00	”
35.	Double distillation unit	31.03.2017	47600.00	”
36.	Hot ari oven digital	31.03.2017	19045.00	”
37.	Autoclave	31.03.2017	19045.00	”
38.	Elctronic microscope - olympus	31.03.2017	142550.00	”
39.	Lab equipment work table	31.03.2017	95200.00	”

40.	Weighing bridge	31.03.2017	45000.00	”
41.	Shed cleaner	31.03.2017	30000.00	”
42.	Brush cutter	31.03.2017	25000.00	”
43.	Refrigerator	31.03.2017	25000.00	”
44.	Milking machine	31.03.2017	50000.00	”
45.	Bolero jeep	31.05.2017	737664.00	”
46.	Sand bath	28.03.2018	11505.00	”

1.8. A). Details of SAC meeting conducted in the year

Sl.No.	Date	No of Participants	Salient Recommendations
1.	07.11.2017	50	• KVK should prepare bankable project proposals for Integrated Farming System and supply to needy farmers on cost basis. • ICAR song should be played in each and every programme of KVK. • KVK Foundation Day programme should be conducted every year along with successful farmer’s exhibition with atleast 500 farmers. • Season oriented trainings/workshops and seminars to be organized to disseminate the technology in time. • Bio-inputs for organic cultivation may be encouraged through supply of bio-inputs from KVK. The area under organic farming may be monitored and database developed. • Continuous generation of data should be made to assess the success and failures of established farms over a period. • Discussions with line departments should be conducted and their suggestions may be carried out before preparing the action plan for subsequent year • Farmers may be taken to Centre for Medicinal Plant, VC&RI, Orathanadu for EVM training and their feedback may be collected and documented. • Availability of poultry vaccines may be made at KVK, Namakkal under Revolving Fund mode. • More farmers should be added in TANUVAS mobile App and technical information should be communicated regularly. • Soil test based fertilizer application may be promoted. • Organic farming should be promoted and farmers details may be collected and published. • Green gram variety IPM 2014, WGG 42 should be raised in crop cafeteria of KVK farm for 2 years. Also BRG 176 redgram variety to be raised in the cafeteria. • Documentation of success stories should be done. • An exhibition should be arranged on successful farming practice as a one-day event, showcasing farmer’s success. This need to facilitate farmer-farmer interaction and learning. • Proposal of successful farmers may be submitted for ICAR and TANUVAS awards. • Alternate poultry farming may be popularized among the farmers. • EVM practices may be popularized among the farmers to protect the animals by natural way of healing ills. • Demonstration of IIHR watermelon variety Arka Mukh suitable for high density planting may be done. • Steps may be taken to popularize karu vazhai in Kollihills • To control the weeds, demonstration of cowpea intercropping with banana may be popularized among the farmers. • Innovative farmers may be selected and trained on integrated pest and disease management at village level for speedy dissemination of information among the farmers • Display boards on pest and disease management may be placed at common places in villages to create awareness among the farmers. • Scientists may be deputed to train the farmers about organic farming and its value addition during ATMA training programmes. • Awareness campaign on shrimp and fish farming may be done to the extension officials during zonal workshops. • Salt tolerant fruit and vegetable varieties may be popularized among the farmers. Water melon variety having pale green with white stripe may be popularized

			in Namakkal district. Traditional trees, vegetables and medicinal plants cultivation should be popularized. • Apiculture should be promoted in orchards and coconut farm to improve the pollination as well as production of crops. Priority may be given to conduct training on sericulture during the months of June and July • Biological way of root rot control in mulberry may be introduced. • Suitable IFS model for dry land agriculture may be prepared and submitted to bank for popularization. KVK scientists may be utilized for water shed projects during the training programmes to save the rain water. Marketing facility may be created at KVK for organic agriculture inputs. • To motivate the farmers on organic farming, economics of organic farming may worked out and educate the farmers to adopt the same. • Parthenium awareness programme may be celebrated

2. DETAILS OF DISTRICT (2017-18)

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

S. No	Farming system/enterprise
1	Pulses - Groundnut - Maize Paddy- Pulses-Minor Millets Pulses – Cotton / Sorghum Paddy – Banana / Sugarcane Cotton-Maize -pulses Sugarcane- Sugarcane Fruit crops Mango- Amla-Sapota-Pomegranate-Guava-Banana Vegetable Crops Chillies-Brinjal-Onion-Lablab (Garden Bean) Plantation crop Coconut-Fodder crops + Intercrop with pulses Arecanut Pepper-coffee Allied Sector Livestock-Poultry-Fisheries Enterprises Fruits-Vegetables-Millets-Milk processing-Value addition millets and Fisheries

2.2.Description of Agro-climatic Zone & major agro ecological situations (based on soil and topography)

S. No	Agro-climatic Zone	Characteristics
1.	North Western Zone	This zone covers an area of 18,271 Sq. kms (10,28,097 hectares) of which 56.3 per cent is under cultivation. Out of total area of cultivation, only 23 percent i.e., 2,35,828 hectares are irrigated area. The annual normal rainfall of the zone is 849 mm. This zone has been identified as moderately drought prone. Paddy, Maize, Ragi, Bajra, Sugarcane, Groundnut, Cotton, Sunflower, and mango are the major crops of this zone. Forest area in this zone constitutes nearly 30 percent i.e. 5,35,282 hectares of the area of the zone, which is nearly 25 per cent of the total forest area of the State. KVK located with geological position N11^{o}09.296' Latitude, E078^{o}09.708' longitude with MSL 509.

2.3. Soil type/s

S. No.	Soil type	Characteristics	Area (ha)
1.	Red loam & Red sandy soil	Light texture, Porous structure, and absence of lime. Poor fertility, Low Base Exchange capacity.	1,98,438
2.	Lateritic	Light texture, open free draining structure, deficient in lime and moderately acid in reaction.	77,357
3.	Black	Porous, compact and impervious, swells on wetting and shrinks, cracks in drying.	38,678
4.	Alluviul	Structure of loose and free draining, compact and impervious.	21,525

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

S. No	**Crop**	**Area (ha)**	**Production (Qtl)**	**Productivity (Qtl /ha)**
Agricultural crops				
1	Paddy	7312	386804	52.9

2	Cholam	47706	363042	7.61
3	Maize	5898	473963	80.36
4	Redgram	1176	3528	3.0
5	Greengram	6995	55400	7.92
6	Blackgram	1410	7261	5.15
7	Groundnut	27292	178489	6.54
8	Sugarcane	11852	9481600	800
Fruits				
1	Banana	1525.5	488174	320
2	Mango	2536.6	237217	93.5
3	Sapota	330.3	34061	103
4	Pomegranate	38.4	2428	63.2
5	Amla	68.6	9815	143
6	Guava	86.0	4198	48.8
7	Acid lime	86.9	11105	14.5
8	Jack	159.9	32540	127.8
9	Pine apple	468.0	182527	390
Vegetables				
1	Tapioca	16023	6154434	384
2	Onion	2018.9	141327	70
3	Brinjal	303.2	45480	150
4	Bhendi	193.0	17353	90
5	Gourds	67.5	9453	140
6	Tomato	272.9	76321	279
7	Chillies	141.2	5650	40
Spices				
1	Turmeric	2053.9	285659	139
2	Pepper	635.4	1276	2
Plantation				
1	Arecanut	624.3	12486	20
Flower crops				
1	Flowers	173.9	1250	7.1

2.5. Weather data

Month	Rainfall (mm)	Temperature ^{0} C		Relative Humidity (%)	
		Maximum	Minimum	Maximum	Minimum
January 2017	3	32.19	28.87	76.29	36.77
February 2017	0.0	34.56	19.93	70.75	27.18
March 2017	6	36.71	24.32	76.42	34.87
April 2017	12	39.63	27.23	70.57	30.13
May 2017	108	37.81	26.58	75.16	38.55
June 2017	27	36.30	26.30	70.13	40.13
July 2017	15	36.42	25.87	74.32	39.06
August 2017	153	34.58	24.84	80.52	49.19
September 2017	277	33.70	24.20	83.77	56.83
October 2017	142	33.65	23.94	84.13	59.45
November 2017	89	32.07	22.43	83.23	57.43
December 2017	79	30.84	20.10	79.55	52.19

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

Category	Population	Production	Productivity
Cattle			
Crossbred	258400	2842400 LPD	11 lit.
Indigenous	49670	248350 LPD	5 lit.
Buffalo	219987	1319922 LPD	6 lit.
Sheep			
Crossbred	151786	2428576 kg	16 kg (6 months)

Goats	462934	7869878 kg	17 kg (6 months)
Pigs			
Crossbred	13927	1114160 kg	80 kg (10 months)
Indigenous	3831	249015 kg	65 kg (10 months)
Rabbits	852	1278 kg	1.5 kg (6 months)
Poultry			
Desi	693212	1386424 kg	2 kg (1 year)
Improved	41787830	2.7 crore egg	190 eggs/bird (72 wks)
Ducks	987	2467.5 kg	2.5 kg (1year)
Turkey and others	710	3550 kg	5 kg (1 year)
Fisheries	6000	20 T	0.114 laks tons
Fish	20ha	35ton	1.75ton/ha
Inland	20ha	35ton	1.75ton/ha
Shrimp	0.4ha	1710	

2.7.Details of Adopted Villages (2017-18)

Year of adoption: 2017-18

Village adoption Under University (TANUVAS) funding during 2017-18

Date	Name of the Programme	Place	Activities performed
24.06.2017	Human Health camp	Aniyapuram	• General health checkup, specific disease diagnosis and treatment was provided
10.08.2017	Kitchen garden	Aniyapuram	• Cultivation of greens and vegetable as low cost model For inculcating nutritious gardening in their home for nutritional security
23.10.2017	Parturition Day	Kalangani	• To emphasis the importance of oestrous synchronization, The farmers along with calved animals were participated and fellow farmers were enlightened.
14.11.2017	Financial literacy programme	Aniyapuram	• Importance of savings and banking behavior was inculcated among students
26.11.2017	National Milk Day	Kalangani	• Skills for Clean Milk Production methods taught and discussed the importance of milk day with the farmers.
19.12.2017	National farmers day	Marakadu	• Farmers and extension officials were taught about hydrophonic fodder production techniques

Details of FLD and OFT-proposed villages (2017-18)

Sl. No.	Taluk/ mandal	Name of the block	Name of the village	Major crops & enterprises	Major problem identified	Identified Thrust Areas
1	Namakkal	Puduchattram	Nochipatti	Green gram	Low yielding long duration variety (var.CO.6,CO.7), YMV incidence (20-30%), Deficit moisture	Introduction of new green gram variety (CO-8) with moisture stress management
2			Kalangani	Dairy Small ruminants and poultry	High somatic cell count Incidence of subclinical mastitis Poor shelf life of milk Economic loss	Assessment of mastiguard efficacy in clean milk production
3		Mohanur	Chinnakarasamp alayam	Paddy, Groundnut	Cultivation of low yielding paddy varieties (BPT 5204, ADT 46, IR 20), Incidence of pest & diseases, Cultivation of low yielding groundnut varieties	Introduction of new paddy variety (CO-52) with drum seeder method of paddy cultivation and demonstration of high yielding groundnut variety (CO-7) with ICM practices.

4			Aniyapuram	Marigold, Tuberose	Low yield (6-7 tonnes/ha) in marigold Occurrence of male flower Unawareness about micronutrient spray (35%)	Demonstration of Marigold var.Arka Alankara
5			R.Pudupalayam	Dairy Small ruminants and poultry	Resistance over mass/frequent/irregular deworming Intensive use of drugs led to poor widespread resistance to all current anthelminthics. Poor health, Anemic animals & mortality Lack of knowledge on RD control management (60%) Inadequate knowledge on EVM treatment (95%). Disease outbreak despite vaccination (40%).	Demonstrating EVM method of deworming & assessment of worm load in Small Ruminants and native chicken
6		Namakkal	Anna nagar	Dairy Small ruminants and poultry	Low egg yielding in native chickens (60 to 80) Slower weight gain Premium price for native chicken at market	Demonstration of performance of improved desi strains at Namakkal district
7	Rasipuram	Namagiripettai	R.Pudupatti	Groundnut Millets	Cultivation of old groundnut variety (TMV7), less pod yield and poor farm income, No awareness on minor millets cultivation	Introduction of high yielding groundnut varieties & minor millets and seed production technology
8			Perappancholai	Paddy Maize	Cultivation of low yielding paddy varieties (BPT 5204, ADT 46, IR 20), Incidence of pest & diseases, higher cost of cultivation, labour scarcity Low available nutrients status Non adoption of soil test based fertilizer application Micronutrient deficiency (Zn-85.7%, B-29.7% & Cu-27.4%). Poor seed filling & Yield loss	Introduction of new paddy variety (CO-52) with SRI method & seed production Soil test based fertilizer application and introduction of high yielding maize hybrid COHM 6

9			Karkoodalpatti	Cabbage, Cauliflower, Carrot, Tapioca Tomato Cucurbits Vegetables Groundnut Flower crops	Price fluctuation in cabbage & cauliflower. Low yield in carrot. Non availability and high demand for Coccinia Continuous & excess application of chemical fertilizer affects the soil fertility Deficiency in available nutrients Non adoption of soil test based fertilizer application Lack of awareness about biofertilizer application Price fluctuation in multiplier onion (Rs.8 – 50) Non availability of Bellary onion during June - September Price rise in bellary onion due to sharp fall in arrivals from Maharashtra	Alternate crop for cabbage and cauliflower with market preference Assessment of Coccinia with high yielding varieties Soil test based fertilizer application and introduction of biofertilizers application microbial consortia Popularization of high yielding Bellary onion varieties
10			Rajapalayam Mettala	Chillies, Tomato, Onion	Low yield in Chilli hybrid Priyanka & Indra	ICM practices in chillies hy.Arka Harita
11			N.Kattur	Tomato	Fruit borer, Sucking pests, leaf curl, TSWV causes yield loss-20% Incidence of nematode leading to yield losses 8 %. Poor plant population.	Integrated pests, diseases and nematode management
12			Thanneerpandal kadu	Tapioca Groundnut Maize Sorghum	Unaware about timely application of potassium Less adoption soil test based fertilizer application Low yield	Introduction of soil test based split application of potassium with ICM practice (Trial is in progress)
13		Vennandur	Moolakdu	Ground nut	Incidence of collar rot & stem rot (20%) Repeated cultivation of age old variety (10yr) Yield loss due to late leaf spot, rust, root rot (33%)&leaf folder, spodaptera incidence Lack of awareness about high yield new varieties Poor yield (850kg/ha)	FFS on Integrated pests and diseases management
14			Vadugampalayam	Shrimp	Unawareness of *L.vannamei* cultivation In venandur block ground water found to be saline, So not suitable for Indian Major Carp(IMC) fish culture	Introduction of shrimp culture of high production & Market price.

15	Sendamangalam	Erumapatti	Devarayapuram	Bhendi	Irregular yellowing of leaf - 8% Severe infestation results in premature defoliation Development of sooty mold Fruit not fit for marketing. Yield reduction-28%	Varietal assessment for YMV
16		Sendamangalam	Sendamangalam	Dairy Small ruminants and poultry J.quail	High chick mortality (10 to 20%) Lack of knowledge on chick rearing methods No water sanitizing in practice	Demonstration of Package of practices to prevent chick mortality in Japanese Quail farming
17	Kollihills	Kolli Hills	Edappulinadu	GIFT Tilapia	Lack of knowledge of scientific integration, low nutritive feed Shortage of critical fish farming inputs Non availability of quality feeds with affordable market price	Alternate culture
18	Paramathy velur	Paramathy	Manickanatham	Black gram, Sorghum	Cultivation of local variety, Incidence of YMV & Pod borer, Low yield	Introduction of new black gram variety (VBN 8), single cut fodder sorghum varieties
19	Thiruchengode	Mallasamu Dhiram	Maanuvakattupalayam	Groundnut Millets	Cultivation of old groundnut variety (TMV7), Low pod and haulm yield, No awareness on minor millets cultivation	Introduction of high yielding varieties and ICM practices in Groundnut and Fox tail millet
20			Palamedu	Cotton-Summer cotton	Incidence of borers and sucking pests-30% Incidence of Stem weevil & wilt-5% Poor plant population Smaller size bolls Heavy secretion of honey dew leads to development of sooty mould. Repeated cultivation of cotton in same field Yield loss due Low number of bolls Poor boll bursting (45%). Poor yield (12q/ha)	Integrated pests management

21		Thrunchengode	Pattalur	Sugarcane	Incidence of borers and white fly -15% Infested leaves with white and black dots. Incidence of woolly aphids-7% Heavy secretion of honey dew leads to development of sooty mould Burning of trashes after harvest of previous crop affects the soil quality. Poor recycling of organic resources. Losses of nutrients from loss due to burning Micronutrient deficiency in soil Yield loss	Integrated pests management Introduction of insitu mulching of sugarcane trashes with ICM practice
22	Kumarapalayam	Pallipalayam	Kumarapalayam	Sugarcane Paddy Tapiocca and Banana Dairy and Small Ruminants	Drought condition Shortage of green and dry fodder Non utilization of crop residues of sugarcane,cassava & banana plant as animal feed	Demonstration on utilization of crop residues of cassava leaves & banana pseudo stem as animal feed

2.8.Priority/thrust areas

Crop/Enterprise	Thrust area
Paddy	Introduction of New paddy variety and ICM Practices
Pulses	Introduction of high yielding varieties with ICM practices
Groundnut	Introduction of high yielding varieties and Integrated pest & disease management
Minor millets	Integrated crop management and value addition
IFS	Farming system model for various ecosystem
Green fodder	Intensive fodder cultivation and seed production in fodder crops
Compost	Farm waste recycling (vermicompost and other compost)
Carrot	Alternate crop for cabbage & cauliflower, Varietal assessment of carrot with high yielding variety
Coccinia	Varietal assessment in Coccinia
Bellary onion	Popularization of high yielding bellary onion variety
Chillies	ICM practices in Chilli hybrid
Marigold	Demonstration of marigold var.Arka Alankara
Cotton	Integrated pests management
Bhendi	Varietal assessment for YMV
Tomato	Integrated pests, diseases and nematode management
Groundnut	FFS on Integrated pests and diseases management
Sugarcane	Introduction of insitu mulching with ICM practice and Integrated pests management
Maize	Introduction of hybrid with ICM practice
Tomato	Introduction of biofertilizers and micronutrient application with ICM practice
Tapioca	Introduction of timely application of nutrients with ICM practice
Livestock Nutrition Management	Demonstration on utilization of crop residues as animal feed
Livestock Disease Management	Demonstrating EVM method of deworming & assessment of worm load in Small Ruminants
Livestock Disease Management	Demonstration on EVM treatment for Ranikhet Disease in Native Chicken
Livestock Disease	Assessment of mastiguard efficacy in clean milk production

Management	
Package of practices for Japanese quail farming	Demonstration of Package of practices to prevent chick mortality in Japanese Quail
Poultry Production	Demonstration of performance of improved desi strains at Namakkal district

3.TECHNICAL ACHIEVEMENTS

3.A. Details of target and achievements of mandatory activities by KVK during 2017-18

OFT (Technology Assessment)				FLD (crop/enterprise/CFLDs)			
1				2			
Number of technologies		Total no. of Trials		Area in ha		Number of Farmers	
Targets	Achievement	Targets	Achievement	Targets	Achievement	Targets	Achievement
7	7	65	65	18.9 & 2830 animals	17.9 ha 2830 animals	190	160

Training (including sponsored, vocational and other trainings carried under Rainwater Harvesting Unit)					Extension Activities			
3					4			
Number of Courses			Number of Participants		Number of activities		Number of participants	
Clientele	Targets	Achievement	Targets	Achievement	Targets	Achievement	Targets	Achievement
Farmers	109	205	3390	6975	147	148	11850	13364
Rural youth	5	35	116	1106	175	177	11649	11666
Extension Functionaries	8	18	370	773	5	8	250	318

Seed Production (Qtl.)				Planting material (Nos.)			
5				6			
Target		Achievement	Distributed to no. of farmers	Target		Achievement	Distributed to no. of farmers
Agri crop seeds	5.0	27.5	123	Setts	25000	32700	27
Fodder seeds	150	175.52	7092	Planting material	5000	8776	1148
Veg.seed	2.00	2.15	1889	Micronutrient mixture	2.5	3.75	49
Biofertilizers	5	7.7	582	Crop boosters	2.5	3.75	129
Bio pesticide				**Bio agents**			
Neem oil (lit)	50	64.5	25	Acerophaus (no)	1000	3982	450
Pungam oil (lit)	05	6.25	15	Trichocard egg (cc)	50	120	120
Pest repellent (lit)	100	185	54	RB lure (no)	0	6	3
Panchakaviyam (lit)	500	598	200	Water trap (no)	0	65	15
Amirtha karasil (lit)	100	118.5	45	Brinijal lure (no)	0	10	5
Themor karasil (lit)	0	8	5	Fruit fly trap (no)	0	27	20
Inchi pondu karasil (lit)	0	82	15	Lucin lure (no)	0	21	9
Muttai karasil (lit)	0	6	3	Funnel trap (no)	0	8	5
Jeevamirtham (no)	0	8	4	TLM lure (no)	0	14	10
Bio fungicide							
Trichoderma viride (kg)	200	384	155	BACW lure (no)	0	11	6
Pseudomonas fluorescens (kg)	200	345	160	Yellow sticky trap (no)	50	172	75
Beauveria bassiana (kg)	50	124	45	Pheromone Trap - Funaltype(no)	100	5500	68
Trichoderma harzianum (kg)	100	182	68	ESB lure (no)	0	10	6
Metarhizium (kg)	25	37	12	INB lure (no)	0	50	25
VAM (kg)	100	108	89	Pectin lure (no)			
Others-beekeeping				Blue sticky trap(no)	0	25	20

Honey bee+ hieve(no)	10	44	44	Pheromone trap (no)	0	33	15
Honey (kg)	50	112.25	80	Spoda Lure (no)	50	117	25
Honey extractor(no)	0	7	7	Heli-lure (no)	0	75	30
Smoker (no)	0	6	6	RPW lure (no)	0	183	50
Bee hives only (no)	0	6	6	Coconut pvc trap-with lure (no)	0	15	7
Gloves (no)	0	1	1				
Others-Mushroom							
Mushroom (kg)	0	84.23	15	Mushroom spawn (no)	0	13	2

3.b. TECHNOLOGY ASSESSMENT

Summary of technologies assessed under various crops by KVKs

Thematic areas	Crop	Name of the technology assessed	No. of trials	No. of farmers
Integrated Nutrient Management	Tomato	Assessment of performance of microbial consortia in tomato	5	5
Varietal Evaluation	Sorghum	Assessment of suitable single cut fodder sorghum varieties for rainfed condition	10	10
	Carrot	Assessing the performance of carrot variety Pusa Rudhira in Namakkal District	20	20
	Coccinia	Assessing the performance of Coccinia varieties in Namakkal District.	5	5
Integrated Pest Management	Bhendi	Assessment of Bhendi Cultivars Tolerant to YMV (Trial is under progress)	10	10
Integrated Crop Management	Paddy	Assessment of new paddy variety CO-52 through different system of cultivation	5	5
Total			**55**	**55**

Summary of technologies assessed under livestock by KVKs

Thematic areas	Name of the livestock enterprise	Name of the technology assessed	No. of trials	No. of farmers
Disease Management	Dairy	1	10	10

Summary of technologies assessed under various enterprises by KVKs

Thematic areas	Enterprise	Name of the technology assessed	No. of trials	No. of farmers
Disease Management	Dairy	Assessment of mastiguard efficacy in clean milk production	10	10

3.c. TECHNOLOGY ASSESSMENT IN DETAIL

OFT -1 (Agronomy)

1. **Thematic area**: Integrated crop management
2. **Title:** Assessment of new paddy variety CO-52 through different system of cultivation
3. **Scientists involved**: Dr.P.Murugan, Scientist (Agronomy) & Dr.N.Akila, Senior Scientist & Head
4. **Details of farming situation**
   - **Location of trial**

     Paddy is a main food crop cultivated in Mohanur, Kabilarmalai, Sendamangalam and Namagitipettai block of Namakkal district in a area of 7312 ha during Samba season (Rabi) of every year. More than 24 per cent of the area is occupied by rice cultivation in different season of Namakkal district. The farmers of Namakkal district are small and marginal farmers, who have already exploited 20 per cent of the potential for rice cultivation and further scope for enhancing yield is limited due to pest and diseases, and system of rice intensification (SRI) technology. In this regards, KVK Namakkal conducted On Farm trial on Assessment of new paddy variety CO-52 through different system of cultivation at five farmers field of Perappancholai and Chinnakarasampalayam village of Namagiripettai and Mohanur block respectively during Rabi season 2017-18. Perappancholai village is situated at 11.42^0 N latitude and 78.46^0 E longitude and Chinnakarasampalayam village is located at at 11.15^0 N latitude and 78.11^0 E longitude.
   - **Major crops grown**

Perappancholai – Paddy, Banana, Maize, groundnut, Tapioca, Coconut and Arecanut
Chinnakarasampalayam – Paddy, Groundnut, Cyprus, Pulses, Banana, Coconut, Causarina.

- **Season**

  The main cropping systems followed by the farmers is Paddy – Banana, Tapioca – Maize / Groundnut and Millets followed by pulses. Main season of paddy cultivation in both villages are September – October (Samba season).

- **Farming situation (Irrigated/Rainfed)**

  Both open and bore wells is a main source of irrigation in Perappancholai village, where as Chinnakarasampalayam village has well and Cauvery river scheme water for cultivation of crops. More than 95 percent of paddy farmers have irrigated the paddy field by flood irrigation method.

- **Climatic condition during the crop period**

  The average annual rainfall of Namakkal District during 2017-18 was 716.5 mm. Out of which, the rainfall received during North East Monsoon is 237.60 mm. Perappanchaolai and Chinnakarasampalayam village received an average rainfall of 163.2 mm with 9 rainy days in October, 90.4 mm of rainfall in 6 rainy days during November, 78 mm of rainfall in 3 rainy days in December and no rainfall during January 2018 and February upto 15th, 2018. During the crop period (October 2017 – 15th February 2018), totally 331.6 mm of rainfall was received in 18 rainy days. Maximum monthly mean temperature was 32.1^{o}C and minimum was 20.1^{o}C.

- **Soil type and fertility status**

  The soil type is sandy clay loam with a pH of 7.4 and EC of 0.4 dSm^{-1} with a soil nutrient status of low Nitrogen (230 kg/ ha), medium Phosphorus (10.4 kg / ha) and high Potassium (312 kg /ha).

5. Problem definition / discription

- The farmers facing low yield as major problems in paddy cultivation is due to heavy incidence of stem borer, leaf folder, blast and BPH disease, non availability resistant variety.
- Further, rice production area is also declining due to non adoption of pest and disease resistant variety during Samba season (August – January)
- Non adoption of improved crop management practices particularly SRI method of paddy cultivation.
- The cost of cultivation of rice also increased from Rs.30,000 to Rs.37500 per hectare due to the cultivation of old varieties and more number of pesticides and fungicides spray
- Poor grain and straw yield
- Less farm income
- Non availability of farm labours during intercultural operations
- Farmers expected alternate variety for BPT 5204.
- The main objective of the study was to assess the performance of new paddy variety CO-52 in different methods of paddy cultivation in Namakkal district for higher grain yield and more net income.

6. Technology Assessed

Three paddy production technology were assessed with new paddy variety CO-52

1. **Traditional paddy cultivation** (Farmers practice) – Higher seed rate (60 kg/ha), manual transplanting, hand weeding and blanket recommendation of fertilizer with BPT 5204 variety.
2. **SRI Method of Paddy cultivation** - Technology was released by Tamil Nadu Agricultural University, Coimbatore during 2008. Technologies include lesser seed rate (7.5kg/ha), mat nursery preparation, early seedling age (14 days), single plant seedlings, square method of planting (25 x 25 cm), alternate wetting and drying, weed management by cono-weeder and leaf colour chart based nutrient management.
3. **Direct drum seeder method of paddy cultivation** - Technology was released by Tamil Nadu Agricultural University, Coimbatore during 2009. Technologies include lesser seed rate (20kg/ha), direct sowing of sprouted seeds in puddled field through drum seeder, no need to prepare paddy nursery, weed management by cono-weeder and nutrient management.

   New high yielding paddy variety seeds (CO-52), seed treatment with bio control agents, nursery management, direct seeding, weed management, nutrient management and integrated pest management practices for major pest and diseases were demonstrated.

Characteristics of New paddy variety CO-52

Medium duration (135 Days), White medium slender rice, Alternate to BPT 5204 variety, Resistant to Blast, Leaf hopper & Plant hopper, Moderately resist to Brown spot, Sheath rot & blight, 62% Head rice recovery, Higher yield (6191 kg/ha) and suitable for samba season of all over Tamil Nadu.

7. Critical inputs given

Name of the critical inputs	*Quantity (kgs)*	*Cost (Rs.)*
Paddy Seed CO-52	75 kg	2503
Seed treatment & field application (Azospirillum and Phosphobacteria)	10 kg	550
Pseudomonas	5 kg	720
Cono weeder	2 no.	3600
Zinc sulphate	25 kg	1125

8. Results:

Table : 1. Performance of the technology

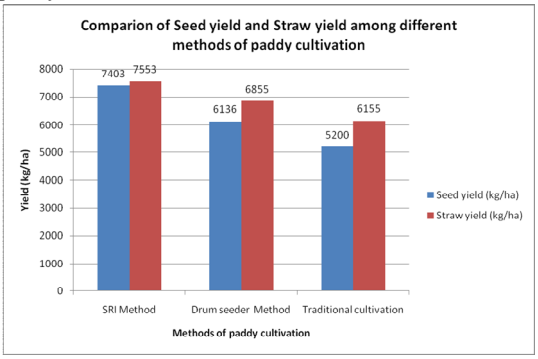
Technology Option	***No.of trials***	***Yield (t/ha)***	***Net Returns (Rs.in Lakhs)***	***B:C ratio***	***No. tillers/hill***	***Stem borer incidence (%)***
Farmers Practice	*5*	*5.20*	*0.43*	*2.10*	*18.2*	*7.2*
Technology 1(SRI Method)		*7.40*	*0.77*	*2.88*	*38.4*	*2.1*
Technology 2(Direct drum seeder method)		*6.13*	*0.60*	*2.56*	*31.5*	*2.3*

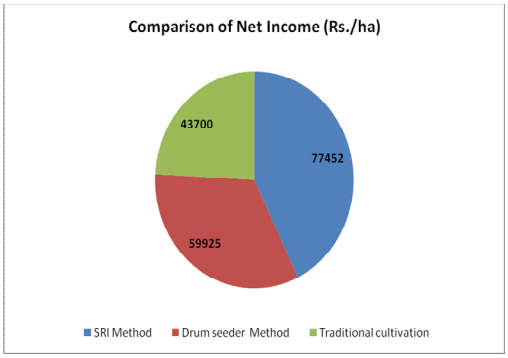
Description of the results

- ✓ The on farm trials was conducted in five farmers field at Perappancholai and Chinnakarasampalayam village during Rabi season (Samba season) 2017. KVK offered off campus training, distributed critical inputs to the beneficiaries and trails were carried out. The yield data recorded in OFT fields under SRI method and drum seeder method of paddy cultivation along with farmers practice. The average yield and yield parameters recorded in the field are mentioned below.

Parameters	***SRI Method (Var:CO-52)***	***Drum seeder method (Var:CO-52)***	***Traditional paddy cultivation BPT5204 (check)***
Germination %	96	91	92
No. Productive tillers / hill (Nos)	38.4	31.5	18.3
Blast incidence (%)	1.6	1.8	3.4
Stem borer incidence (%)	2.1	2.3	7.2
Leaf folder incidence (%)	2.3	2.6	8.2
1000 grain weight (g)	15.27	15.25	15.55
Seed yield (tons/ha)	7.40	6.13	5.20
Straw yield (tons/ha)	7.55	6.85	6.15
Gross cost Rs. /ha	41000	38250	39500
Gross return Rs. /ha	118452	98175	83200
Net return Rs. /ha	77452	59925	43700
BCR	2.88	2.56	2.10

- ✓ On farm trial results revealed that SRI method of paddy cultivation with new paddy variety (CO-52) recorded more number of productive tillers (38.4),very less incidence of blast disease (1.6%), stem borer (2.1%), leaf folder (2.3%), higher grain yield (7403 kg/ha) and straw yield (7553 kg/ha) as compared to direct drum seeder method and traditional paddy cultivation practiced by farmers.
- ✓ The least grain yield (5300 kg/ha) and paddy straw yield (6155 kg/ha) were observed in traditional method of paddy cultivation.





- ✓ Economics of the study revealed that SRI method of paddy cultivation with new paddy variety (CO-52) registered higher net returns (Rs.77452/ha) and benefit cost ratio (2.88) followed by direct drum seeder and farmers practice.
- ✓ The study showed that cultivation of new paddy variety CO-52 under SRI method responded well in terms of yield attributes, grain yield, straw yield and higher net returns were obtained.
- ✓ Fetched higher market price due to very fine slender rice and most of the farmers were accepted for preference and cooking quality.

Constraints faced:

Non availability of labour for square and line method of planting and cono-weeder operations. Seeds shattering during harvesting stage was observed.

9. Feed back of the farmers involved:

New paddy variety CO-52 recorded higher productive tillers (35- 40 tillers / hill) and seed yield compared to BPT 5204 under both SRI and Drum seeder method. Very less incidence of pest and diseases and also fetched higher market price. The cost of pesticide spray is also drastically reduced from Rs.6000 to Rs.2500/acre. The higher paddy straw yield (75 bale/acre) also recorded in CO-52 paddy variety.

10. Feed back to the scientist who developed the technology:

New paddy variety CO-52 recorded higher grain yield (7.40 ton/ha) under SRI Method compared drum seeder and traditional paddy cultivation (BPT 5204) practiced by farmers. CO-52 prone to less incidence of blast, leaf folder and stem borer incidence and also fetched higher market price for seeds (Rs.23 / kg) due to very fine variety. The paddy straw yield also recorded higher (7.55 ton/ha) under SRI Method compared to check variety (6.15 ton/ha). Seeds shattering during harvesting stage was observed in CO-52 Paddy variety compared to BPT 5204.

OFT-2 (Agronomy)

1. **Thematic area**: Varietal evaluation
2. **Title**: Assessment of suitable single cut fodder sorghum varieties for rainfed condition
3. **Scientists involved**: Dr.P.Murugan, Scientist (Agronomy) & Dr.N.Akila, Senior Scientist & Head
4. **Details of farming situation**

- ❖ **Location of trial**

Sorghum is cultivating in an area of 70000 ha under both rainfed and irrigated condition in Namakkal district. Farmers cultivating CO-4 sorghum variety since long back because its performed well under rainfed condition, good palatability, red colour grains, short duration (95 days) and compact ear head. The farmers are cultivating CO-4 variety as green fodder and dry fodder for their livestock. Constraint of this variety is less fodder yield. It is cultivated both in kharif and rabi season of every year under rainfed condition. Many times the crop was became failure due to deficit of rainfall, so farmers using this crop as dry fodder like hay. Non-availability of single cut fodder sorghum has delayed the timely sowing at farmers field. Hence, KVK conducted on farm trail to assess the suitable single cut fodder sorghum varieties along with CO-4 variety under rainfed condition at ten farmers field of Manickanatham and Karaikuruchipudur village of Paramathy and Puduchattram block respectively during Kharif season 2017-18. Manickanatham village is situated at 11.11^0 N latitude and 78.00^0 E longitude and Karaikuruchipudur village is located at at 11.35^0 N latitude and 78.17^0 E longitude.

- ❖ **Major crops grown**

Manickanatham – Sorghum, Green gram, Black gram, Maize, groundnut, Tapioca, Coconut
Karaikuruchipudur – Sorghum, Green gram, Black gram, Groundnut, Tapioca and maize.

- ❖ **Season**

The main cropping systems followed by the farmers are Pulses – Groundnut, Sorghum – Pulses, Tapioca – Maize / Groundnut. Sorghum is cultivated both kharif and rabi season of every year under rainfed condition. KVK trial sowing has taken up during August month (Kharif season) with available soil moisture.

- ❖ **Farming situation (Irrigated/Rainfed)**

Fodder sorghum mainly cultivated in rainfed condition in both villages. If water source is available, they irrigate the field.

- ❖ **Climatic condition during the crop period**

The average annual rainfall of Namakkal District during 2017-18 was 716.5 mm. Manickanatham village received an average rainfall of 121 mm with 12 rainy days in August, 159.3 mm of rainfall in 8 rainy days during September, 91.2 mm of rainfall in 6 rainy days in October and 16 mm of rainfall in 1 rainy days upto 15^{th} of November. During the crop period (August 2017 – 15^{th} November 2017), totally 387.5 mm of rainfall was received in 27 rainy days. Maximum monthly mean temperature was 32.8^oC and minimum was 20.5^oC.

Karaikuruchi pudur village received an average rainfall of 94 mm with 7 rainy days in August, 147 mm of rainfall in 6 rainy days during September, 138 mm of rainfall in 6 rainy days in October and 43 mm of rainfall in 3 rainy days during upto 15th of November. During the crop period (August 2017 – 15th November 2017), totally 422 mm of rainfall was received in 22 rainy days. Maximum monthly mean temperature was 33.4°C and minimum was 21.6°C.

❖ **Soil type and fertility status**

The soil type is red loamy with a pH of 7.8 and EC of 0.8 dSm^{-1} with a soil nutrient status of low Nitrogen (211 kg/ ha), medium Phosphorus (10.2 kg / ha) and high Potassium (304 kg /ha).

5. Problem definition / discription

- Non availability of single cut fodder sorghum varieties for rainfed cultivation
- Poor fodder yield in local varieties
- Unable to withstand under moisture stress condition
- Cost of green fodder and dry fodder is high during drought period
- Most of the time after harvest of sorghum ear head, remaining portion of hay only available for fodder, its contain very less nutritive value
- Non availability of green fodder for livestock
- Cost of milk production is high
- The main objective of the study was to assess the performance of single cut fodder sorghum varieties (CO-27, PC-23) along with local check variety under rainfed condition of Namakkal district for higher fodder yield and more farm income of livestock farmers.

6. Technology Assessed

Two single cut fodder sorghum varieties were assessed along with check variety CO-4.

1. **Cultivation of CO-4 sorghum** (Farmers practice) – short duration (95 days), Good palatability, red colour grains, compact ear head and less fodder yield (25 t/ha).
2. **Cultivation of CO-27 sorghum** - Variety was released by Tamil Nadu Agricultural University, Coimbatore. Single cut fodder sorghum variety, high fodder yield (44t/ha), protein content is 7.93%, dry matter – 24.19%, single tillering and sugar content is 7.4% and good palatability.
3. **Cultivation of PC-23 sorghum** - Variety was released by Indian Agricultural Research Institute, New Delhi. Single cut fodder sorghum variety, good palatability, suitable for rainfed condition, high fodder yield (40 t/ha), suitable for all over the country.

7. Critical inputs given

Name of the critical inputs	*Quantity (kgs)*	*Cost (Rs.)*
Sorghum seeds (PC 23)	80	5100
Sorghum seeds (CO 27)	100	6000
Pseudomonas	10	1200

8. Results

Table : 1. Performance of the technology

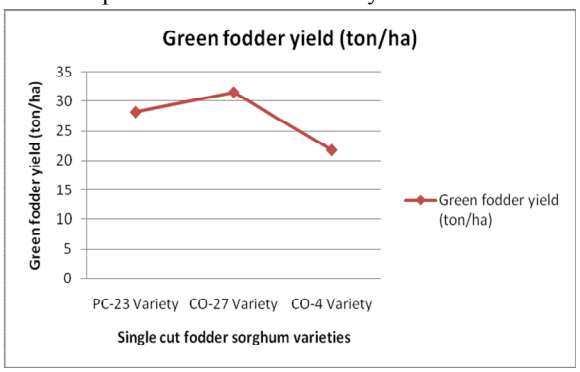
Technology Option	***No.of trials***	***Fodder Yield (t/ha)***	***Net Returns (Rs.in Lakhs)***	***B:C ratio***	***Plant height at Maturity (cm)***	***No. of leaves / stem***
Farmers Practice (CO-4 variety)	*10*	*21.8*	*0.28*	*2.81*	*155*	*13.5*
Technology 1(CO-27 variety)		*34.5*	*0.46*	*3.72*	*225*	*18.6*
Technology 2(PC-23 variety)		*32.2*	*0.39*	*3.33*	*192*	*14.2*

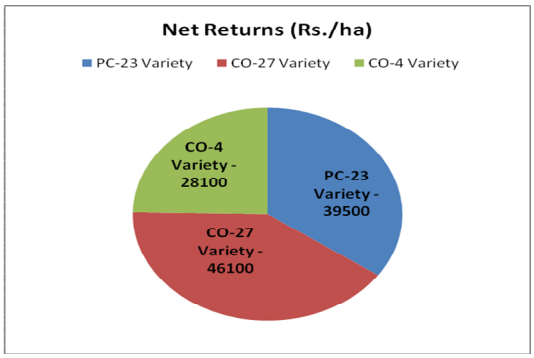
Description of the results

Arameters	***Fodder Sorghum (PC-23)***	***Fodder Sorghum (CO-27)***	***Fodder Sorghum(CO-4) Check variety***
Germination %	91	93.2	88.5
No.of tillers / hill (Nos)	1	1	1
Plant height at 75 days (cm)	192	225	155
No. of leaves at 75 days (Nos)	14.2	18.6	13.5
Palatability	Good	Good	Good
Green fodder yield (ton/ha)	28.2	31.5	21.8
Gross cost Rs. /ha	16900	16900	15500
Gross return Rs. /ha	56400	63000	43600

Net return Rs. /ha	39500	46100	28100
BCR	3.33	3.72	2.81

- ✓ The on farm trials were conducted in ten farmers field at Manicknatham and Karaikuruchi pudur village during kharif season 2017. KVK offered off campus training, distributed critical inputs to the beneficiaries and demonstration were carried out. The yield and other parameters data recorded in OFT trials and presented below
- ✓ On farm trial results revealed that cultivation of fodder sorghum variety (CO-27) recorded more plant height (225 cm), more number of leaves (18.6), higher green fodder yield (31.5 ton/ha) as compared to PC-23 and CO-4 (check variety) fodder sorghum varieties.
- ✓ The least green fodder yield (21.8 ton/ha) and less plant height were observed in local check variety (CO-4).
- ✓ Economics of the study revealed that cultivation of fodder sorghum variety (CO-27) registered higher net returns (Rs.46100/ha) and benefit cost ratio (3.72) followed by PC-23 variety and local check variety.
- ✓ The study showed that cultivation of single cut fodder sorghum variety (CO-27) performed well under rainfed condition of Namakkal district in terms of fodder yield and higher net returns were obtained.
- ✓ Regarding fodder palatability, all the fodder sorghum variety has good palatability based on livestock feeding test.
- ✓ All the OFT farmers have accepted CO-27 fodder variety as good single cut green fodder sorghum compared compared to local check variety.





Constraints faced: Non availability of sorghum variety CO-27 and PC 23 during sowing time.

9.Feed back of the farmers involved

Among the three fodder sorghum varieties, CO-27 given higher green fodder yield compared to PC-23 & CO-4 under rainfed condition. Stem size of fodder sorghum variety CO-27 was slightly bigger than PC-23 & CO-4. Small ruminants were rejected the bigger size fodder stem during feeding.

10. Feed back to the scientist who developed the technology

CO-27 sorghum variety obtained higher green fodder yield (31.5 ton/ha) compared to other PC-23 (28.2 ton/ha). There was no incidence of pest and diseases during growing period.

OFT- 3 (Horticulture)

1. **Thematic area**: Varietal assessment
2. **Title**: Assessing the performance of Carrot variety in Namakkal District
3. **Scientists involved**: Dr.C.Sharmila Bharathi Scientist (Horticulture) & Dr.N.Akila, Senior Scientist & Head
4. **Details of farming situation**
   - ❖ **Area of Demonstration**

     On Farm Testing on "Assessing the performance of carrot variety in Namakkal District" was carried out at twenty farmers' field in an area of one ha in Karkoodalpatti village, Namagiripettai block of Namakkal District during Rabi season 2017 - 18. Karkoodalpatti village is situated at 11.456^0 N latitude and 78.27^0 E longitude and at an elevation of 341m above mean sea level. This village is located at foothills of Kollihills.
   - ❖ **Crops grown**

     Namagiripettai is main market place for nearby Farmers/ Villagers to market their agriculture produces, from here they supplies or distributes all grown crop products to nearby city Namakkal, Salem, Erode and also to Chennai. This block is known for Vegetable hub of Namakkal District. Because all types of vegetables can be grown throughout the year. Karkoodalpatti village tropical vegetables such as Tomato, Chillies, Radish and Tapioca & Temperate vegetables / Cole season vegetables such as Cabbage, Cauliflower, Carrot and Beans are commercially cultivated in an area of 314 ha under irrigated condition.

- **Season**

  The main cropping systems followed by the farmers are Cabbage – Tomato – Cabbage/cauliflower. Most of the farmers cultivated cabbage throughout the year but the main sowing seasons are Oct – Nov, January and June – August.

- **Farming situation (Irrigated/Rainfed)**

  Both open wells (depth 60 -100 feet) and bore wells (Depth 800 feet) act as a main irrigation source. 70 % of the farmers used drip irrigation whereas 30 % of the farmers followed flood irrigation to cultivate the vegetable crops.

- **Weather and climate during the study period**

  The average annual rainfall of Namakkal District during 2017-18 was 703 mm. Out of which, the-rainfall received during North East Monsoon is 237.60 mm. Karkoodalpatti village received an average rainfall of 163.2 mm with 10 rainy days in October, 90.4 mm of rainfall in 7 rainy days during November and 78 mm of rainfall in 3 rainy days in December. During the study period (October, 2017 – December, 2017), totally331.6 mm of rainfall was received in 20 rainy days in Karkoodalpatti village.

- **Soil type and fertility status**

  The soil type is red sandy loam with a pH of 7.1 and EC of 0.064 dSm^{-1} with a soil nutrient status of low available Nitrogen (212 kg/ ha), medium available Phosphorus (11 kg / ha) and high available Potassium (294 kg /ha).

5. Problem definition / Description

- In this village the farmers faced major problems such as price fluctuation in cabbage & cauliflower (Rs.3-5/kg) and also high cost involved for pest and disease management.
- Cabbage growers in the village generally rely on synthetic pesticides like profenophos, cypermethrin, Proclaim, carbendazim + mancozeb for management of pests and diseases and the frequency of applications ranges from one spray/week depending upon the season and pests and disease load.
- In addition, the farmers prefer alternate crop which is having short duration, low cost involved for cultivation and also to get premium price in the market.
- In response to the threat of low market price in cabbage and high cost involved for cultivation particularly for pest management in cabbage, Krishi Vigyan Kendra, Namakkal, Tamil Nadu has formulated and implemented an OFT on Assessing the performance of Carrot variety in Namakkal District in 20 farmers field covering one ha area at Karkoodalpatti village during October 2017 – December 2017.
- The objective of the study was to assess the performance of carrot variety Pusa Rudhira as a alternate crop for cabbage, reduce cost of production by reducing the input cost for cabbage cultivation as wells as to increase the net income of the farmer.
- The intervention consisted of six components viz., promoting carrot cultivation through supply of high yielding variety seed, seed treatment with bio control agents, sowing of seeds in raised bed, soil test based manuring, foliar spray of micronutrients and integrated pest management practices for major pest and diseases.

6. Technology Assessed: (give full details of technology as well as farmers practice)

TO1	Farmers practice	Cultivation of Cabbage var.Hari Rani
TO2	Recommended practice	Cultivation of Carrot var.Pusa Kesar or Korada Pusa kesar - Developed at the IARI, New Delhi. It has red-coloured roots and self-coloured core. It can tolerate higher temperature. Suitable for sowing from August - early October. Crop matures in 90-110 days with average yield 30 t/ha. Source : IARI,New Delhi,2000
TO3	Alternate practice	Cultivation of Carrot var.Pusa Rudhira The variety Pusa Rudhira (IPC 122) is a new tropical red carrot. It is suitable for for sowing from August - October. It is characterized by green foliage and long red coloured self core roots. It takes 75-90 days to reach marketable stage for harvesting with an average root yield of 30 t/ha. It is a rich source of total carotenoids (7.60 mg/100 g), b-carotene (4.92 mg/100 g), lycopene (6.70 mg/100 g), iron (230 mg/ g), zinc (10.70 mg/g), and antioxidant superoxide dismutase activity (8.92 g/h). Source : IARI, New Delhi,2010

7. Critical inputs given

S.No	Name	Qty (Kg)	Unit cost (Rs.)	Total cost (Rs.)
1.	Carrot seed – Pusa Rudhira	5 kg	2500/Kg	12,500.00

8. Results

Table 1. Performance of the technology

Technology Option	*No.of trials*	*Yield (t/ha)*	*Net Returns (Rs. in lakh./ha)*	*B:C ratio*	*Data on Other performance indicators**
Farmers Practice	*20*	19.2	22,430	1.3	Diamond Back Moth Incidence in cabbage – 8.5 %
Technology 1(Mention details)		17.3	1,10,260	2.7	-
Technology 2(Mention details)		18.54	1,18,925	2.8	-
Technology 3(Mention details)					

Description of the results

Table 2. Vegetative and yield parameter of Carrot varieties

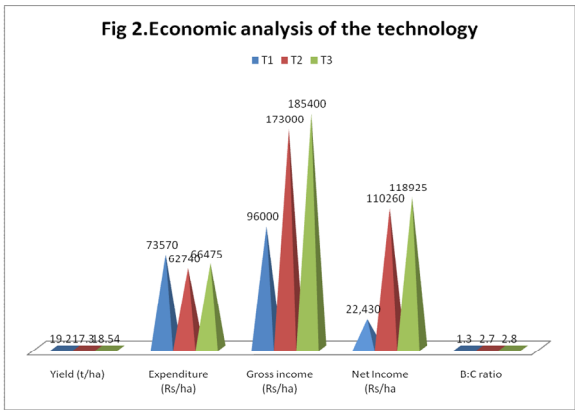
Parameters	Recommended practice (Pusa Kesar) – TO2	Alternate practice (Pusa Rudhira) – TO3
No. of leaves	8.13	12.1
Length of compound leaves (cm)	30.9	66.3
Root tuber length (cm)	13.4	22.7
Weight of carrot with tops (gm)	206.9	327.4
Weight of the root tuber alone (gm)	99.4	151.1
Diameter of root top (cm)	2.86	4.44
Diameter of middle of the tuber (cm)	1.31	2.49
Diameter of tip of the tuber (cm)	0.90	1.23
Yield (t/ha)	17.3	18.54
Gross cost (Rs)	62740	66475
Gross return (Rs)	173000	185400
Net return (Rs.)	1,10,260	1,18,925
B:C ratio	2.7	2.8

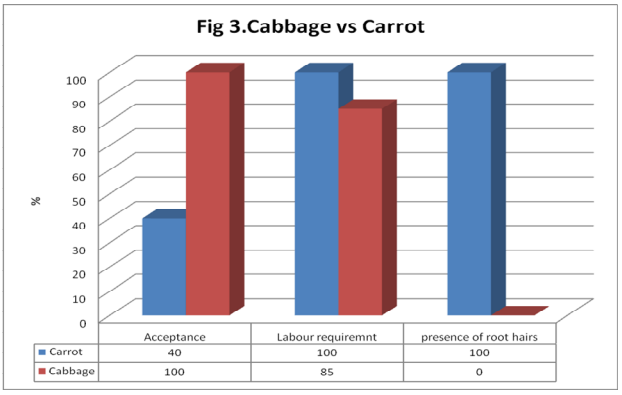
Description

- In farmers practice (T1), cabbage seedlings var.Hari Rani was planted during October 2017 at a spacing of 45 x 45 cm with a plant population of 19753/0.4 ha. The cabbage head was harvested on 110 days after planting and recorded a maximum cabbage yield of 19.2 tonnes/ha and sold at the rate of Rs. 5/Kg.
- In case of recommended practice (T2) as well as alternate practice (T3), the farmers sown the carrot seed during October 2017 at a spacing of 30 x 30 cm in raised bed and advised to mix the 200 gm of carrot seed with 4 parts of sand. The plant population maintained per 12.5 cent was 5555.

Vegetative characters of carrot

- Among the two varieties of Carrot, Pusa Rudhira performed well at Karkoodalpatti village of Namakkal District. Pusa Rudhira (T3) recorded the highest leaf length/ plant (23 cm and 38.5 cm) at 30 and 60 days after sowing followed by Pusa Kesar (T2) which registered 17.1 and 27.2cm respectively.
- The vegetative characters exhibited difference with respect to varieties. Among the two varieties, it was observed that the no.of leaves (12.1) and length of compound leaves (66.3) was the highest in Carrot var.Pusa Rudhira (T3) followed by Pusa Kesar (T2) which registered 8.13 cm and 30.9 cm respectively (Table 1).
- Pusa Rudhira was harvested in 80 days after sowing. In case of Pusa Kesar harvesting was done at 100 days after sowing.
- With respect to yield parameters viz., the maximum root tuber length (22.7 cm), weight of carrot with tops (327.4 gm) and weight of root tuber alone (151.1 gm) was recorded in T3 followed by T2 with 13.4 cm, 206.9 gm and 99.4 gm.
- Likewise among the varieties tested , the diameter of top(4.44 cm),middle (2.49 cm) and tip (1.23 cm) portion of root tuber was found maximum in T3 when compared to T2 (2.86 cm,1.31 cm and 0.90 cm) .
- With respect to yield, the maximum yield per ha (18.54 tonnes) was recorded in T3 whereas T2 recorded 17.3 tonnes/ha and sold at the rate of Rs.10/kg. The variety (T3) showed an increase of 6 % over T2.





Constraints faced

The farmers faced low level of acceptance from the consumers during the initial time of marketing due to red coloured tuber that is new to Namakkal District.

9. Feed back of the farmers involved

The farmers felt that more labours involved for harvesting, cleaning and removal of root hairs. 25% of OFT implemented farmers continued the carrot cultivation with Pusa Kesar variety while remaining farmers discontinued the carrot cultivation.

10. Feed back to the scientist who developed the technology

It is noticed that at the time of harvest, more root hairs present in the tubers. So the tuber without root hairs may be preferable.

OFT- 4 (Horticulture)

1. **Thematic area**: Varietal assessment
2. **Title**: Assessing the performance of Coccinia varieties in Namakkal District
3. **Scientists involved**: Dr.C.Sharmila Bharathi, Scientist (Horticulture) & Dr.N.Akila, Senior Scientist & Head
4. **Details of farming situation**

- **Area of Demonstration**

  On Farm Testing on "Assessing the performance of Coccinia varieties in Namakkal District" was carried out at five farmers' field in an area of one ha in Semmankadu village, Namagiripettai block of Namakkal District during Rabi season 2017-18. Semmankadu village is situated at 11.452^0 N latitude and 78.27^0 E longitude and at an elevation of 341m above mean sea level. This village is located at foothills of Kollihills.

- **Crops grown**

  Semmankadu village is coming under Namagiripettai block of Namakkal District. In this village Tomato, Chillies, Beet root, Cucurbits like Snake gourd, Bittergourd, Cucumber and Ribbed gourd are commercially cultivated in an area of 273 ha under irrigated condition. Most of the cucurbits are grown under bower system *(Pendhal system)*.

- **Season**

  Most of the farmers cultivated ribbed gourd, bitter gourd and snake gourd throughout the year in an area of 0.2 to 0.4 ha, but the main season is January and July. The farmers got subsidy from department of Horticulture and erected the pendhal (bower system) for trailing the vines of cucurbits.

- **Farming situation (Irrigated/Rainfed)**

  Both open wells (depth 60 -100 feet) and bore wells (Depth 800 feet) act as a main irrigation source. 80 % of the farmers used drip irrigation whereas 20 % of the farmers followed flood irrigation to cultivate the cucurbits.

- **Weather and climate during the study period**

  The average annual rainfall of Namakkal District during 2017-18 was 703 mm. Out of which, the rainfall received during North East Monsoon is 237.60 mm. Semmankadu village received an average rainfall of 163.2 mm with 10 rainy days in October, 90.4 mm of rainfall in 7 rainy days during November,78 mm of rainfall in 3 rainy days in December, no rainfall in January, 6 mm of rainfall in 1 rainy day in February,2018 and 36 mm of rainfall in 2 rainy days in March 2018. During the study period (October, 2017 – March, 2018), totally 373.6 mm of rainfall was received in 23 rainy days.

❖ **Soil type and fertility status**

The soil type is red sandy loam with a pH of 7.82 and EC of 0.085 dSm^{-1} with a soil nutrient status of low organic carbon (0.44 %), medium available Nitrogen (251 kg/ ha), medium available Phosphorus (12.8 kg / ha) and low available Potassium (73 kg /ha).

5. Problem definition / Description

- In this village the farmers faced major problems such as low price of ribbed gourd and snake gourd (Rs.5-10/Kg). The farmers directly sold their produce at Mettala market and Uzhavar santhai, Rasipuram.
- In the same market the farmers come to know the sale price of Coccinia and the demand for this crop is very high.
- Due to non availability of Coccinia, the price of the fruits ranged from Rs.40-50/kg.
- In response to the high demand and non availability of Coccinia, Krishi Vigyan Kendra, Namakkal, Tamil Nadu has formulated and implemented an OFT on Assessing the performance of Coccinia varieties in Namakkal District in 5 farmers field covering one ha area at Semmankadu village during October 2017 – March 2018.
- The objective of the study was to assess the performance of Coccinia varieties to meet the demand of the market, make availability of Coccinia as wells as to increase the net income of the farmer.
- The intervention consisted of four components *viz.,* promoting cultivation of Coccinia in the existing pendhal system through supply of planting materials, soil test based manuring, foliar spray of micronutrients and integrated pest management practices for major pest and diseases.

6. Technology Assessed

TO1	Farmers practice	Cultivation of Cucurbits viz., Ribbed gourd,Snake gourd and Bitter gourd
TO2	Recommended practice	Cultivation of Coccinia var. Aanaikatti sln/Co1 • Clonal selection from Anaikatti type. Fruits are long, green with white stripes, less seeded and sweet (4.5o Brix). Suitable for culinary purpose. • Duration – Perennial • Yield - 83.09 (t/year) Source : TNAU,Coimbatore,2016
TO3	Alternate practice	Cultivation of Coccinia var. DRC2 DRC 2, a variety of Coccinia promising 70 tonnes per hectare and that can be stored for over 10 days Source : UAS,Dharwad,2015

7. Critical inputs given

S.No	Name	Qty (Kg)	Unit cost (Rs.)	Total cost (Rs.)
1.	Rooted Cuttings	Each 250 cuttings	10/cuttings	5000.00

8. Results

Table 1. Performance of the technology

Technology Option	***No.of trials***	***Yield (t/ha)***	***Net Returns (Rs. in lakh./ha)***	***B:C***	***Data on Other performance indicators****
Farmers Practice	5	12	38300.00	1.66	
Technology 1(Mention details)		6.3	97988.00	2.65	Viral incidence (80%) was noticed in Anaikatti Sln/Co1 Coccinia.
Technology 2(Mention details)		7.5	131750.00	3.36	-
Technology 3(Mention details)					

Description of the results

Table 2. Yield parameter of Coccinia varieties

Parameters	Recommended practice (A.Sln/Co2) – TO2	Alternate practice (DRC 2) – TO3
No.of laterals/plant	7	11
Days taken for first flowering	38	32
Nodes at first fruiting	21	15
Fruit length (cm)	5.4	7.5
Fruit diameter (cm)	2.2	3.1
Average fruit weight (g)	17.1	23.1
No.of fruits/vine	16.8	25.5
Yield (t/ha)	6.3	7.5

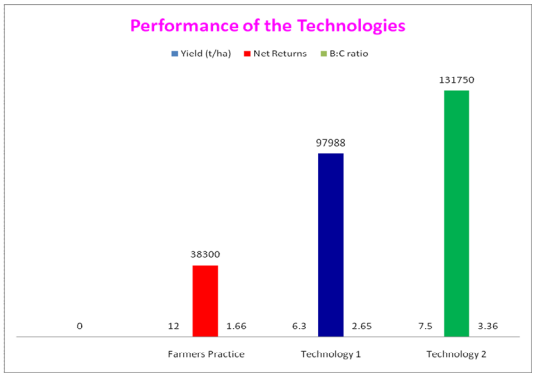
Gross cost (Rs)	59512	55750
Gross return (Rs)	157500	187500
Net return (Rs.)	97988	131750
B:C ratio	2.65	3.36

Description

- In farmers practice (T1), Ribbed gourd was sown during October 2017 at a spacing of 2x6 feet with a plant population of 330 plants/25 cent . The first harvest was taken 45 days after sowing & extended up to 90 days and recorded a maximum yield of 12 tonnes/ha and sold at the rate of Rs. 8/Kg.
- In case of recommended practice (T2) as well as alternate practice (T3), the farmers are advised to plant the rooted cuttings at a spacing of 6x6 feet. The plant population maintained per acre was 800 or 80/10 cent.

Yield parameters of Coccinia

- Among the two varieties of Coccinia, DRC2 performed well at Semmankadu village of Namakkal District. DRC2 (T3) recorded more number of laterals/ plant (11) at 5 months after planting followed by A.Sln (T2) which registered 7 laterals.
- The number of days taken for first flowering exhibited significant difference with regard to varieties. Among the varieties tested, T3 recorded the lowest days taken for first flowering (32 days), followed by T2 which registered 38 days.
- With respect to no. of nodes at first fruiting, T3 exhibited first fruiting at lowest node (15th node) whereas in T2 first fruiting was noticed in 21st node.
- Likewise among the varieties tested , the fruit length (7.5 cm),fruit diameter (3.1 cm) and average weight of the fruit (23.1g) was found maximum in T3 when compared to T2 (5.4, cm,2.2 cm and 17.1 g) .
- With respect to number of fruits/vine, the maximum number of fruits/vine was noticed in T3(25.5 fruits) when compared to T2 with 16.8 fruits.
- Among the two varieties studied, the maximum yield per ha (7.5 tonnes) was recorded in T3 whereas T2 recorded 6.3 tonnes/ha and sold at the rate of Rs.25/kg. The variety (T3) showed an increase of 16 % over T2.
- Both the varieties, first harvesting was made at 60 days after planting. Subsequent harvest was made once in a week. Totally 4 harvesting was done in a month with 6 labours/week.
- The economic analysis revealed that the highest expenditure (Rs.59512 /-) was incurred in cultivating Coccinia var.A.sln as compared to DRC2 (Rs.55750/-) & Ribbed gourd (Rs.57700/-) and the maximum net return (Rs.1,31750/-) was obtained from the variety DRC2. The highest cost of cultivation in Coccinia was due to purchase of more pesticides to control the vector to transmit the viral incidence. Therefore, farmers could save an amount of Rs.3762/- besides getting additional profit of Rs.30000/- while growing DRC2 cocinnia with good market price. The Cost: Benefit ratio also high (1:3.36) in DRC2.



Constraints faced

It is noticed that the fruit fly incidence was severe when coccinia is cultivated along with other cucurbits.

9. Feed back of the farmers involved

The farmers felt that virus free planting material is highly needed for cultivation because they need to spray pesticide weekly when the viral incidence occurs to control the vector population.

10. Feed back to the scientist who developed the technology

Since it is the most economical crop, virus free planting material is needed for cultivation without loss of crop in the initial stage as well as to reap good harvest at least for two years.

OFT- 5 (Entomology)

1. **Thematic area**: Integrated Pest Management
2. **Title:** Assessment of Bhendi Cultivars Tolerant to YMV
3. **Scientists involved**: Th.C.Sankar, Scientist (Agricultural Entomology) and Dr.N.Akila, Senior Scientist and Head
4. **Details of farming situation**

Namakkal district is situated in the North Western and Western Agro climatic zones. Minimum temperature prevailing is 22°C and maximum temperature is 38°C. Farmers are cultivating vegetables based crop system both in kharif and Rabi season under irrigation condition such as bhendi, chilies, brinjal, tomato, cucumber, bottle gourd, pumpkin and bitter gourd are important cash crops grown in more than 300 ha in 207-18. Bhendi, *Abelmoschus*

esculentus, is an herbaceous annual plant in the family Malvaceae which is grown for its edible seed pods. Farmers production was 15t/ha in operation villages and Potential yield was 22.1 t /ha.

Soils were rich in organic matter with a pH ranged between 5.8 to 6.8. The soil was sandy loam in texture, low in available N (192 kg ha^{-1}), low in available P (6.7 kg ha^{-1}), medium in avialble K (182 kg ha^{-1}). The crop received seasonal rain fall of 3mm during sowing with in one rainy days. Now the crop is vegetative stage and trials under progress.

5. Problem definition / description

The incidence of Yellow mosaic virus, Fruit damage due to insect pests is a big concern for farmers and economic losses vary between 15to 30%. The Virus is transmitted by white fly *Bemisia tabaci*. It causes huge loss occurs at early stage of crop. The infected leaves show alternate patches of green and yellow. Veins become clear and chlorate spot. With the progress of disease the veins become conspicuous and both vein and vein lets become thick. In advance stage the stems and leaf stalk become distorted

Infested Fruits are yellowish green in color and small in size .Irregular yellowing of leaf (8%), severe infestation results in premature defoliation, Development of sooty mould, Fruit not fit for marketing and Yield reduction was (28%). The Nymphs is Greenish yellow, oval in outline and Adult Minute insects with yellow body covered with a white waxy bloom.

6. Technology Assessed

Tech. option	Name the technology assessed	Salient Features
TO -1	Farmer practices:F1 hybrid	High yielding variety, sustable to YMV
TO -2	CO -4 (TNAU, 2016)	Tall plants - 135-150 cm; dark green, tender, medium size fruits; 25-29 Fruits/plant; 22 harvests in 110 days starting from 39 days after sowing; Resistant to bhendi YVMV disease
TO -3	Kashi Kranti (IIVR, 2013)	Medium to tall in growth having 2-3 branches. First flower appears after 39-41 days after sowing on 5th nodes During rainy season and 4rd node during summer season. Average fruits/plant are 21-23 having dark green in colour and 10-11 cm in length. Yield potential is 140-150 q/ha. Resistant to YMV, high yielding and better for kharif season & summer season
TO -4	PhuleVimukta (MPKV, Ramrri.2016)	High yield-206 q/ha, Resistant to YMV, Attractive dark green colour fruits &shining, Tolerant to whitefly and fruit borer , high content of calcium and phosphorus

7. Critical inputs given

Tech	**Name of critical input**	**Critical input /Trail (0.2ha) (kg)**	**Budget /Trial (Rs.)**
TO2	CO4-2kg/ha@Rs 2000 /kg	0.15	312
TO3	Kashi Kranti -2kg/ha@Rs 602 /kg	0. 5	301
TO4	PhuleVimukta -2kg/ha @Rs 860 /kg	0.8	528

8. Results: - Trial under progress

Table 1. Performance of the technology

Technology Option	**No.of trials**	**Yield (t/ha)**	**Net Returns (Rs. In)**	**B:C ratio**	**Data on Other performance indicators***
Farmers Practice- F1 hybrid	10	Sowing completed on last week of March-2018 Now crop at vegetative stage. Germination percentage CO-4 95%, Kashi Kranti-85% and PhuleVimukta 90%			Plant population /m2
Technology 1 CO -4					No of fruits /plant
Technology 2 Kashi Kranti					No of branch /plant
Technolog 3 PhuleVimukta					Fruits Wt
					Percent incidence of YMV,
					Per cent control of white fly incidence

a. Description of the results: Trial under progress

b. Constraints faced:-

9. Feed back of the farmers involved

- Use of yellow sticky trap as first time for bhendi.

- Farmers requested to make availability of *Beavearia* at Department to control of leafhopper.
- Germination percentage CO -4 is 95%, Kashi Kranti-85% and PhuleVimukta is 90%

10.Feed back to the scientist who developed the technology: Trial under progress

OFT-6 (Soil Science)

1. **Thematic area**: Nutrient management
2. **Title: Assessment of performance of microbial consortia in tomato**
3. **Scientists involved: Dr.S.Sathya Scientist (Soil Science) & Dr.N.Akila, Senior Scientist & Head**
4. **Details of farming situation**

❖ **Area of Demonstration**

On Farm Testing on "Assessment of performance of microbial consortia in tomato" was carried out at five farmers' field in an area of 1.2 ha in Karkoodalpatti village, Namagiripettai block of Namakkal District during Rabi season 2017 - 18. Karkoodalpatti village is situated at 11.456^0 N latitude and 78.27^0 E longitude and at an elevation of 341m above mean sea level.

❖ **Crops grown**

Namagiripettai is major belt for agricultural and horticultural crops. Karkoodalpatti village has been selected to implement the OFT and having cultivable area of 591 ha under irrigated condition. Paddy, maize, sorghum, millets banana, tapioca, turmeric, neerium, all kinds of vegetables, coconut, arecanut are the major crops grown in Namagiripettai.

❖ **Season**

The main cropping systems followed by the farmers are Groundnut – Tomato – Gourds. Most of the farmers cultivated tomato throughout the year but the main sowing seasons are Oct – Nov, January and June – August.

❖ **Farming situation (Irrigated/Rainfed) – Irrigated condition**

Bore well and well is the main source of irrigation. Mostly farmers applying fertilizers in surface broadcasting and with this 25 % of the farmers used 19-19-19 fertilizer as source of nutrients during the flowering and fruit initiation stage of tomato.

❖ **Weather and climate during the study period**

The average annual rainfall received in Namakkal District during 2017-18 was 716.5 mm. Ofwhich, the rainfall received during North East Monsoon was 237.60 mm. Karkoodalpatti village received an average rainfall of 163.2 mm with 10 rainy days in October, 90.4 mm of rainfall in 7 rainy days during November, 78 mm of rainfall in 3 rainy days in December and 6 mm of rainfall in 1 rainy day in February 2018. The village received 337.6 mm of rainfall in 21 rainy days during the experimental period October 2017 – February 2018. Maximum monthly mean temperature was 29.9^oC and minimum was 23.4^oC. Maximum monthly mean relative humidity was 89.0 per cent and minimum was 61.3 % at 07.22 and 14.22 hr, respectively.

❖ **Soil type and fertility status**

The experimental soil type was black in colour, sandy loam in texture and non calcareous. The soil was neutral in soil reaction (7.14), non saline (0.13 dS m-1), low in organic carbon (0.41%), low in available nitrogen (261 kg/ ha), medium in available phosphorus (17.66 kg / ha), medium in available potassium (138 kg /ha), medium in available sulphur (13.97 ppm), deficient in available zinc (1.05 ppm) and boron (0.38 ppm).

5.Problem definition / Description

- Continuous cropping with high yield crop with high demand of fertilizers causes detoriation in soil fertility. Imbalanced fertilizer application without soil testing and lack of awareness on integration of biofertilizers in fertilizer schedule created widespread nutrient deficiency in soil.
- Mostly organic carbon (OC), nitrogen (N), zinc (Zn) and boron (B) was found to deficient in most of the soil. Losses of N through the volatilization of gaseous N from the soil, easily fixing capacity of phosphorus & zinc are the reason behind the widespread deficiency and also creating loss in yield of plants. To improve the fixation and solubilization of native and fixed nutrients in soil, separate nutrient fixing and solubilizing biofertilizers recommended for soil application as well as seed treatment.
- Skipping of application of biofertilizers is a common practice if not getting the biofertilizers in the single place. Biofertilizers application not only improves the fertility and biological properties of soil but involved in reduction of 25% of chemical fertilizers from the recommended fertilizer level. To keeping all these points in view, the OFT on "Assessment of performance of microbial consortium in tomato" was implemented in Karkoodalpatti village during October 2017 – February 2018 in an area of 1 ha. The objective of the study was to assess the performance of microbial consortium in soil fertility improvement and crop productivity.

- In this trails soil application of consortium, soil test based nutrient application, foliar spray of micronutrients and integrated pest management practices were intervened.

6.Technology Assessed: (give full details of technology as well as farmers practice)

TO1	Farmers practice	Application FYM @ 12.5 t ha^{-1} as basal DAP @ 125 kg ha^{-1} applied as basal Complex 20:20:20 @ 250 kg ha^{-1} applied as basal 19: 19: 19 kg ha^{-1} @ 250 kg ha^{-1} applied at flowering to harvest stage Skipping of biofertilizer & Micronutrient i.e. Zinc Sulphate and Borax application
TO2	Recommended practice	Application FYM @ 25 t ha^{-1} as basal Soil application with azospirillum & phosphobacteria (N fixing bacteria & P solubilizing bacteria) each @ 2 kg ha^{-1} + 100 % RDF NPK & Micronutrients Soil application of N as urea @ 434 kg ha^{-1} (4 splits @ basal, 30,45,60 DAP) P as SSP @ 1562.5 kg ha^{-1}, K as MOP @ 417.5 kg ha^{-1} (4 splits @ basal, 30,45,60 DAP), Zn as Zinc sulphate @ 50 kg ha^{-1}, B as Borax @ 10 kg ha^{-1} **Source :** TNAU, Coimbatore, 2013
TO3	Alternate practice	Application FYM @ 25 t ha^{-1} as basal Soil application with Arka Microbial Consortia (N fixing bacteria, P, K & Zn solubilizing bacteria & plant growth promoting rhizobia) @ 5 kg ha^{-1} + 100% RDF NPK & Micronutrients Soil application of N as urea @ 434 kg ha^{-1} (4 splits @ basal, 30,45,60 DAP) P as SSP @ 1562.5 kg ha^{-1}, K as MOP @ 417.5 kg ha^{-1} (4 splits @ basal, 30,45,60 DAP), Zn as Zinc sulphate @ 50 kg ha^{-1}, B as Borax @ 10 kg ha^{-1} **Source :** IIHR, Bangalore, 2015

7. Critical inputs given:

S.No.	Name	Qty (kg)	Unit cost (Rs.)	Total cost (Rs.)
1.	Azospirillum	5	55	275
2.	Phosphobacteria	5	55	275
3.	Arka Microbial consortia	15	195 including transport	2925

8.Results

Table 1: Performance of the technology

Technology Option	***No.of trials***	***Yield (t/ha)***	***Net Returns (Rs. in lakh./ha)***	***B:C ratio***	***Data on Other performance indicators****
Farmers Practice	*5*	*50.39*	*142061*	*2.29*	
Technology 1 (TNAU recommended practice)		*58.12*	*174276*	*2.50*	
Technology 2 (TNAU Recommended practice + Arka microbial consortia application instead of Azospirillium & phosphobacteria)		*63.60*	*201210*	*2.72*	

Description of the results

Table 2: Fruit Yield (t ha^{-1}) and yield attributes (Fruit weight (g) and No. of fruits /plant)

Particulars	Farmers practice	Recommended practice	Alternate practice
Fruit yield (t ha^{-1})	50.39	58.12	63.60
Fruit weight (g)	69.30	77.06	79.83
No. of fruits /plant)	65.14	86.34	96.29

Table 3: Soil nutrient status of initial and post harvest analysis

Particulars	Initial soil test values	Post harvest soil test values		
		Farmers practice TO1	Recommended practice TO2	Alternate practice TO3
pH (Soil reaction)	7.14	7.22	7.31	7.33
Electrical Conductivity (dS m^{-1})	0.13	0.15	0.18	0.19
Organic carbon	0.41	0.39	0.44	0.45
Available Nitrogen (kg ha^{-1})	261	243	268	272

Available Phosphorus (kg ha^{-1})	17.66	17.28	17.92	17.96
Available Potassium (kg ha^{-1})	138	128	140	148
Available Sulphur (mg kg^{-1})	13.97	13.30	14.04	14.12
Available Zinc (mg kg^{-1})	1.05	1.00	1.08	1.31
Available boron (mg kg^{-1})	0.38	0.31	0.40	0.42

Description

- The highest fruit yield of tomato in alternate practice was recorded 63.60 t/ha and proved its superiority by recording 26.21% yield increase over farmers practice followed by recommended practice having fruit yield of 58.12 t/ha & 15.34 % increase in fruit yield. Similarly average fruit weight (79.83 g) and number of fruits per plant (96.29) was also higher in alternate practice compared to other practices.
- With regard to fertility status of initial and post harvest soil, depletion in available nutrients was noticed in farmer practice. The nutrient status in post harvest experimental soil of alternate and recommended practice stated that there was increase in available nutrient status (N, P, K & Zn) when compared to farmers practice.

Constraints faced

Farmers are regularly getting seedlings from nearby Private Shadenet Nursery, hence they couldnot visualized the seedling vigour due to lack of application of microbial consortia along with cocopit. Market prize was poor during experimental period. So convinced more to maintain the field with good management practice and take observations in every harvest.

9. Feed back of the farmers involved

Fruit yield of tomato was good and cumulative weight of five fruits having size of 1 kg during peak harvest. Farmers asked to ensure the availability of microbial consortia during the transplanting since it is produced from IIHR, Bengaluru. Also got poor market prize during the experimental season. So they not interested to maintained upto six months.

10. Feed back to the scientist who developed the technology

Good technology. Single packet contains all beneficial organisms, which supports to enrich the soil fertility (N,P,K & Zn) as well as crop productivity. Liquid formulation can be done to recommend the same to farmers having drip fertigation system.

OFT- 7 Livestock

1. **Thematic area**: Livestock Disease Management- Mastitis Management
2. **Title**: Assessment of mastiguard efficacy in clean milk production
3. **Scientists involved**: Dr.M.Jothilakshimi, Scientist (Animal Science) and Dr.N.Akila, Senior Scientist and Head
4. **Details of farming situation**

In Namakkal district, the cattle and Buffalo population as per 19th livestock census is 220700,107830 respectively and mainly small and marginal farmers possess more than 50 % of the cattle population. The farming system is of Semi intensive system representing mixed crop–livestock farming. As cattle and buffalo are the preponderant and the most interactive species, subsisting on crop residues and contributing milk, meat, draft power and farmyard manure. Mostly the farmers' rear crossbred Jersey and HF animal for higher milk production. Annual milk production in Namakkal during 2017-18 was 152.93 million litres and more than 80 % of milk marketed through organized sector.

5**. Problem definition / description**

Mastitis is a multi-etiological and complex disease with inflammation of parenchyma of mammary glands. It is characterized by physical, chemical and usually, bacteriological changes in milk, and pathological changes in glandular tissues. The occurrence of disease is an outcome of interplay between three major factors: infectious agents, host resistance, and environmental factors. Mastitis is a global problem as it adversely affects animal health, quality of milk and the economics of milk production, and causes huge financial losses. The affected cows lose fifteen percent of production potential and affected quarter loses up to thirty percent milk producing capacity. In addition, bacterial contamination of milk render it unfit for human consumption and provide a mechanism of spread of diseases like tuberculosis, sore-throat, brucellosis, leptospirosis etc. and has zoonotic importance.

Sub - clinical infections are those for which no visible changes occur in the appearance of milk or the udder, but milk production decreases, somatic cell count increases, pathogens are present in the secretion and the milk composition is altered. The prevalence of sub - clinical mastitis has been shown to be 15 to 40 times more than the clinical mastitis and it forms the basis of herd outbreaks. As no gross abnormality in milk and udder is noticed, sub - clinical mastitis goes unnoticed by the farmers. Therefore, sub-clinical mastitis is considered more important due to negative impact on the economy. Somatic cells are indicators of both resistance and susceptibility of cows to

mastitis and can be used to monitor the level or occurrence of sub - clinical mastitis in herds or individual cows. Somatic cell count is a useful predictor of intramammary infection and therefore, an important component of milk in assessment of aspects of quality, hygiene and mastitis control.

6. Technology Assessed

TO1	Farmers practice	No control measures adopted
TO2	Recommended practice	Use of teat dip with disinfectant solution e.g. KMNo4 Using teat dip with antiseptic solution reduces the incidence of mastitis by destroying disease causing pathogens Source : TANUVAS, 2012
TO3	Alternate practice	Masti - Guard to control mastitis Masti-Guard is the combination of Teat protection and Mastitis screening package. It contains Teat protect antiseptic for udder spray and TANU check SCC Kit for subclinical mastitis identification Source : TANUVAS, 2016

7. Critical inputs given

S.No	Name	Qty (kg)	Unit cost (Rs.)	Total cost (Rs.)
1.	Mastiguard	20	400	8000
2.	Teat dip with KMNo4	10	300	3000

8. Results

Table : 1 Performance of the technology

Technology Option	***No.of trials***	***Yield (lt/day)***	***Net Returns (in Rs /Animal)***	***B:C ratio***	***Data on Other performance indicators* Somatic cell count(in lakhs)***
Farmers Practice	*10*	8.0	400	*1.01*	4-5
Technology 1(Mastiguard)		10.50	12600	*1.50*	0.5
Technology 2(teat dip with antiseptic solution)		10.25	11300	*1.40*	0.5-1

Description of the results

- In farmers practice (T1), the farmers were not adopted any measure to prevent mastitis and the somatic cell count of milk was in higher side (4.5-5.0 lakhs) and if the animal went under stress (which may be of physiological, environmental etc., immediately resulted in somatic cell count beyond the threshold value (>5,00,000) and mastitis occurrence (25-30%) was noticed. The milk production during mastitis was reduced to 8 ltr/day and treatment cost also added in the production cost. In addition additional labour of one man day was needed for total period of treatment regime.
- In case of recommended practice (T2) – The farmers are advised to use teat dip antiseptic solution KMNO4 for udder washing before milking. A pinch of KNMO4 was added in half litre of water in the teat dip and after pink coloration of the water, the farmers advised to wash all the four quarters, after that with the water, complete washing of udder also recommended twice a day before milking. In addition they were taught to identify sub clinical mastitis occurrence by changes in udder physiological and physical quality of milk.
- In Mastiguard usage, the somatic cell count was very low (<50,000) and mastitis occurrence was nil. Additional average milk production of .75 ltr was also recorded as teat protect anti septic spray after milking closed the teat pores prevent excess calf feeding. Even the animal with prior history of seasonal mastitis occurrence also have the lower somatic cell (<.5 lakh) with healthy udder. With alternate practice (T3), The farmers advised to use teat protect to spray over the udder opening after milking twice a day and through washing of udder with clean water before milking. In addition they were taught to use TANU check SCC kit to identify the sub clinical mastitis from pooled milk sample immediately after milking by assessing somatic cell count. If somatic cell count value of (> 5 lakhs), Individual quarter milk analysis is recommended.

Table 2: Cost benefit analysis of Mastitis prevention Methods

Parameters	TO1 (demo)	TO2	Regular treatment (check)
Treatment materials used	Mastiguard usage	Teat dip with antiseptic usage	No prevention measures
Number of days under trial	6 month	6 month	6 month
Number of Animals taken for trial	10	10	10
Number of Mastitis occurrence	Nil	Nil	3
Somatic cell count (in lakh)	<0.5	< 0.5-1.0	< 5
Cost of treatment (Rs.) /Trial/unit	300	200	3500
Milk yield increase/day	500 ml	250 ml	Nil
Gross cost (Rs.)	25200	24200	28400
Selling price /lit of milk (Rs.)	20	20	20
Net return/ 6 month (Rs.)	12600	11300	400
Benefit Cost Ratio	1.50	1.40	1.01

Constraints faced

Usually immediately after milking, the farmers went to Co-opt / private milk society to pour the milk. While using TANU check SCC kit, the farmers need to wait for 30 minutes to identify Sub clinical mastitis.

9. Feed back of the farmers involved

The farmers felt that using Mastiguard prevent their dairy animal from mastitis occurrence and save them from treatment cost of Rs.3000-4000 and saves Rs. 50 per day from production loss of single quarter and reduces the chances of disease spread and they expressed their convenience in using teat protect and requested to betterment in TANU check Scc kit for immediate test result to identify sub clinical mastitis.

10. Feed back to the scientist who developed the technology

Sub clinical mastitis identification time should be of less than 5 minutes will helpful for the farmer to adhere the result in somatic cell count and orient themselves under clean milk production by discarding the milk with higher somatic cell value and immediately start treatment to mastitis prevention.

3.d. FRONTLINE DEMONSTRATION

a. Follow-up of FLDs implemented during previous years

S. No	Crop/ Enterprise	Thematic Area	Technology demonstrated	Details of popularization methods suggested to the Extension system	Horizontal spread of technology		
					No. of villages	No.of farmers	Area in ha
1	Barn yard millet	Varietal introduction and ICM Practices	Demonstration of Barnyard millet variety CO(Kv)-2 and ICM Practices	Demonstration of seed treatment, soil application of *Pseudomonas*, application of micro-nutrient mixture, manual harvesting, field day and value addition practices	2	20	8
2	Tapioca	IPM	Use of clean planting material & Remove the alternate host *abutilon indicum* from the field Setting up of Light trap-1 no/ ha Setting up of yellow sticky -25 no/ha Foliar spraying of Neem oil 2% and Neem seed kernal extract 3% at nymphal stage Need based foliar spraying of Triazophos - 2 ml/lit	Method demonstration on setts treatement, training, mass media ,weather based advisory and leaflets	5	65	130
3	Banana	Nutrient management	Demonstration of ICM in Banana	During Training, demonstration, group discussion with farmers, exhibition and meeting with extension personnel	8	24	48
4	Livestock	Nutrition Management	Azolla cultivation under shade net	Training, Exhibitions, Farmers mela and sales at KVK ATIC	5	30	50 tanks
5	Livestock	Nutrition Management	Mixed Fodder cultivation	Training, Exhibitions, Farmers mela and sales at KVK ATIC	10	200	25

b. Details of FLDs implemented during the current year

Sl. No.	Crop	Thematic area	Technology Demonstrated	Season and year	Source of funds	Area (ha)		No. of farmers/ demonstration			Reasons for shortfall in achievement
						Proposed	Actual	SC/ST	Others	Total	
1	Fox tail millet	Varietal introduction and ICM practices	Demonstration of Foxtail millet variety CO-7 and ICM Practices	Rabi 2017	ICAR	10	4	0	10	10	Non availability of seeds from TNAU.
2	Chillies	ICM	ICM practices in chillies Hy.Arka Harita	Kharif 2017	ICAR	0.5	0.5	7	23	30	-
3	Bellary onion	ICM	ICM practices in Bellary onion var.Arka lalima	Rabi 2017	ICAR	1	1	2	18	20	-
4	Marigold	ICM	ICM practices in Marigold cv.Arka Alankara	Rabi 2017	ICAR	0.4	0.4	1	4	5	-
5	Cotton	IPM	Demonstration on IPM in cotton	Kharif 2017	ICAR	4	4	-	10	10	-
6	Sugarcane	IPM	Demonstration on Bio-intensive IPM module in sugarcane	Kharif 2017	ICAR	4	4	-	10	10	-
7	Tomato	Bio-intensive pest management	Demonstration of Bio-intensive pest management strategies in tomato	Rabi 2017-8	ICAR	4	4	-	10	10	-
8	Sugarcane	Fertility management	Insitu mulching of trashes in ratoon sugarcane with ICM practice	Early Kharif 2017-18	ICAR	6	6	0	15	15	-
9	Maize	Fertility management	TNAU maize hybrid COHM 6 with ICM practice	Early Rabi 2017	ICAR	3	3	14	1	15	-
10	Tapioca	Fertility management	Split application of potassium with ICM practice	Late Rabi 2018	ICAR	6	6	0	15	15	Season for tapioca in selected block is fall on late rabi season of every year. Now crop is four month old.

Details of farming situation

crop	Season	Farming situation (RF/Irrigated)	Soil type	Status of soil			Previous crop	Sowing date	Harvest date	Seasonal rainfall (mm)	No. of rainy days
				N	P	K					
Fox tail millet	Rabi 2017	Rainfed	Red soil	Medium	Low	Medium	Groundnut	28.09.2017	09.01.2018	483	14
Chilies	Kharif 2017	Irrigated	Red soil	Medium	High	High	Tomato	10.09.2017	28.11.2017 to 25.02.2018	567.2 mm (September 2017 – February 2018)	30
Bellary onion	Rabi 2017	Irrigated	Red soil	Medium	High	High	Tomato	15.11.2017 (Transplanted)	23.02.2018	210.6 mm (November 2017- February 2018)	11
Marigold	Rabi 2017	Irrigated	Red soil	Low	Medium	High	Groundnut	24.09.2017	26.10.2017 to 28.01.2018	578 mm (September 2017 – January 2018)	18
Cotton	Kharif 2017	Irrigated	Red soil	High	Low	High	Green gram	First week of June 2017	Last week of September 2017	219.84	7
Sugarcane	Kharif 2017	Irrigated	Balck soil	Medium	Medium	Low	Sugarcane	First week of June 2017	First week of March 2018	354.54	6
Tomato	Rabi 2017-18	Irrigated	Red soil	Low	High	Medium	Maize	First week of March 2018	Trial is under progress	3.2	1
Sugarcane	Early Kharif 2017-18	Irrigated	Black soil	Low	Medium	Medium	Sugarcane	05.04.2017	2.04.2018 to 28.04.2018	748.74 mm (April 2017 to April 2018)	45
Maize	Early Rabi 2017	Irrigated	Black soil	Low	Medium	Medium	Sorghum	04.09.2017	10.01.2018 to 01.02.2018	537 mm (September 2017 – February 2018)	31
Tapioca	Late Rabi 2018	Irrigated	Black soil	Low	Medium	Medium	Maize	11.01.2018	Trial is under progress	-	-

Technical Feedback on the demonstrated technologies

S. No	Feed Back
Foxtail millet	Foxtail millet variety CO-7 performed very well under rainfed condition of Namakkal district. Higher grain yield (11.62 q/ha) was recorded compared to traditional variety (8.12 q/ha). Number of tillers (6.5 tillers/plant) and Panicle length also more (19.8 cm).
Chillies	In Chilli hybrid Arka Harita recorded a maximum plant height of 81.2 cm, 8 number of primary branches, 23 number of secondary and tertiary branches at 90 days after planting. With respect to fruit/pod characters, it registered a maximum fruit length of 13.9 cm, fruit girth of 2.7 cm and number of fruits/plant (83). 15 – 16 number of green chilli are present in100 gm.
Bellary Onion	Bellary onion var.Arka lalima exhibited the maximum plant height of 51.7 cm and 19 no.of leaf sheath/plant at 45 days after transplanting. This variety recorded a maximum polar diameter (6.8 cm) equatorial diameter (7.7 cm) of onion bulb and a single bulb weight of 104 gm.

Marigold	Marigold var.Arka Alankara recorded a maximum plant height of 64.2 cm, each 5 number of primary and secondary branches at 45 days after planting. Flowering started 40 days after transplanting. It registered a maximum flower diameter of 7.7 cm, stalk length of 5.3 cm and 58 number of flowers/plant. 10 number of flowers weighing around 80.25 gm. In one kg 121 number of flowers are present.
Cotton	Demonstration of pheromone trap and Yellow sticky trap gave a good alternative way to control for the borer and sucking pest without much of cost and damage to environment.(No of adults / Traps-2.46nos). Higher symbolical branches (12.06/plant), Boll formation (74.82/plant), yield (19.4 Q/ha) and increase in yield was (21.64%) was observed .Overall performance of the IPM module showed higher yield realization of 19.4 q/ha than the local check of 15.4q/ha .The intensity of pesticides spray has been reduced to 3 no's from 12 that saved an amount of Rs.9600/-
Sugarcane	Release of egg parasitoid, Trichogramma chilonis @ 2.5 cc / release / ha (6 release of at 15 intervals starting from 4th month onwards) control the borers. In field early shoot borer infested plant was 5.1%, internodes borer infested plant was 6.31% and no. of adult/ trap at 15 days interval was 7.04. Soil application of neem cake @ 250 kg/ha effectively control the sucking pests and the results of (No. of cane/ hill 18.6 nos), individual cane wt/ hill (2.46 kg), height of cane/ hill (14.7cm), yield (59.6 t/ha) and yield was 8.40.
Tomato	Demonstration on Marigold as trap crop(4:1), Border crop of Caster or maize, Setting up of yellow sticky trap @ 12 Nos / ha, Release of egg parasitoid, Trichogramma chilonis @ 6.25cc / release / ha. Setting up of pheromone traps @ 12Nos. /ha, foliar spraying of Beauveria bassiana @ 2g/ lit of water for sucking insects- pests and application of Neem cake with Paecilomyces lilacinus @ 5 Kg/ ha for nematode management . Setting up of yellow sticky gave a good alternative way to control for the sucking pest without much of cost. Now the crop under vegetative stage.
Sugarcane	TNAU biominerlizer decomposed the trashes with in four months and supplied the nutrients to ratoon crop. Farmers need not apply organic manure for next crop. They can saved upto Rs.13,333 by adopting insitu residue incorporation, controlling weeds and frequent irrigation.
Maize	Non availability of seeds at local market and plant height of COHM 6 seems more (255 cm) when compared to NK 6240 (215 cm) and prone to lodging during heavy wind and rain. No lodging was noticed only the field having tree barriers around the field.
Silage making	Crop residues gross energy(569 K.cal), and crude protein(1.95%) got enriched by ensiling, resulted in low cost alternative animal feed Laborious and time consuming procedure of stamping in silage making, needs to be replaced by suitable farm mechanization
Small Ruminants	EVM for ecto and endo parasites resulted in better weight gain(17 kgs), shiny coat and lower worm load Availability of ready to use EVM formulation makes easier adoption. As collection of herbs and preparation of formulation needs labour which is scarce and costly
Japanese Quail farming	Japanese quail mortality was reduced by 18% by adopting scientific package of practices Wholesome Kit with water sanitizer, multi vitamin and modified waterer, protein rich availability will be feasible for easy adoption.
Native Chickens	Inoculation of EVM after RD vaccination resulted in lower mortality(4%) and slighter weight gain Liquid EVM formulation is better to minimize the wastage and better adoption
Shrimp	*Litopenaeus vannamei* growth and survival was good, conventional farming needs water exchange 40-45 days, production per hectare is around 3-4 tonnes.
Gift tilapia	GIFT tilapia in this integrated culture system recovered nutrients by utilizing natural foods derived mainly from piggery wastes, reducing the nutrient input for fertilization and minimizing the environmental impacts of pond effluents. And production cost is less compare to with out integrated farming systems.

Farmers' reactions on specific technologies

S. No.	Feed Back
Foxtail millet	Higher grain yield was recorded due to more number of panicles per plant and No incidence of pest & diseases.
Chillies	Farmers felt that pest and disease incidence was very less in Chilli Hy.Arka Harita and also yielded for 7 months, provided good irrigation and maintenance.
Bellary Onion	In Bellary onion cultivation, farmers felt that the procurement price of bellary onion is high @ Rs.15/kg when compared to small onion @Rs.10/kg. They much prefer the colour of the onion bulbs has good market value.
Marigold	In marigold, the farmers felt that preference of golden yellow colour in the market is very less and also sold @ Rs.20-30/kg when compared to pure yellow flower (Rs.50/kg). In Both the varieties flowering started at 40 days after planting. But the duration of flowering extended up to 120 days in Arka Alankara whereas in local variety flowering completed in 90 days. But there is no market uptake.

Cotton	Farmer's appreciated the sucking pest trapped in the yellow sticky traps and pheromone trap and they have released the Nipping or Topping gave them a real eye opening of cotton bolls. Farmers felt that demonstrated IPM module performed better than existing practices and importance of bio fertilizers application, bioagents tarps and lures. They expressed the problem of non-availability of bio agents in near area and how to use in time. Farmers said that use to apply micronutrient mixture for any micronutrient problems which resulted in high cost. Though FLD specific micronutrient problem was addressed through applying particular micronutrient like cotton plus which realized to reduce the fertilizer cost (Rs.500/acre/time) and increasing in yield (21.64%). Farmers do not know about the exact dose of NAA to the crop. NAA was used at 40 ppm on 40 and 70 days after sowing which resulted in reduction of flower and fruit drops. They realized during the FLD programme about the importance of installing yellow sticky trap and farmers came forward to purchase the lures and bioagents. Bioagents is low cost as compared to other pesticides its performance is comparatively better as stated by the farmers. Now only farmers know about sold of ELS variety in high cost compared to non ELS cotton through proper marketing in group approach
Sugarcane	This Technology reduced the occurrence of pest significant manner and good alternative to reduce their pesticide expenses (Rs800/acre) in one time. Some of the farmers not aware about tricho card and when it has to release. Though FLD specific incidence of borer's problem was addressed through Demonstration of Bio-intensive IPM module in sugarcane for particular borers which realized as good approach to reduce the cost. Farmers felt that well aware to purchase the lures and bioagents after demonstration of FLD and Farmer felt this as good alternative to reduce their pesticide expenses
Tomato	Farmers felt that seed treatment with bioagents not done previously becaue they have purchased seedlings directly from private shadenet nursery.
Sugarcane	Yield of sugarcane was good, frequency of irrigation was reduced and also noticed less weed growth in the furrows. Shredding of trashes after the harvest of previous cane with tractor drawn sugarcane trash shredder caused the damage to cane and uprooted the plant especially in black soil. Also shredding is not possible during rainy days and frequent turning up for hastening the compost also laborious.
Maize	Farmers felt that yield of COHM 6 was not recorded as similar to private hybrid NK 6240.
Silage making	The farmers are willing to adopt bag silage preparation continuously for effective utilization of crop residue and by these saved production cost and income increase but they felt that labour requirement for stamping crop residues as major constraint in these technology.
Small Ruminants	Even though the farmer aware of ingredients and preparation of EVM formulation, they expressed their interest on availability of readymade formulation for easy adoption. The farmers told that EVM medication resulted in increased weight gain and shiny coat, helped them to fetch higher prices.
Japanese Quail farming	Farmers expressed drastic reduction in Japanese quail chick mortality by using sanitizer to sanitize water, multi vitamin supplement to prevent sprawling of legs, waterer with glass balls to prevent chick drowning and protein rich feed for better weight gain resulted in better revenue in quail rearing
Native Chickens	Farmers opined that EVM formulation after vaccination helps to reduce mortality and better weight gain during marketable age helped them to fetch more profit from desi chicken farming. They expressed their interest towards liquid EVM formulation instead of powder for easy adoption.
Shrimp	Farmers flet the new intervention for gaining a good profit.
Gift tilapia	GIFT Tilapia ratio would maximize the profits and minimize the environmental impact of pond effluents.

Extension and Training activities under FLD

Sl.No.	Activity	No. of activities organised	Date	Number of participants	Remarks
1	Field days	1	18.1.18	13	Field day in Marigold-ADH,Mohanur and Farmers from Aniyapuram were participated along with KVK Scientists.District collector and Officials from Dept of Agriculture visited the FLD – Marigold var.Arka Alankara demonstrated plot at Aniyapuram on 6.1.2017.
		2	5.1.18, 17.1.18, 9.2.18	64	Field day conducted at Maanuvakattupalayam village along with line department officials. The Namakkal District collector visited our FLD demo and interacted with scientist and farmers at R.Pudupatti village.
		1	20.02.2018	70	Field day on integrated pest management in groundnut was conducted at Moolakkadu on 20.02.2018
		1	23.02.2018	45	Field day on Assessment of Bio-intensive IPM module in Sugarcane was conducted at Pattalur on
2	Farmers Training	3	4.10.2017 7.8.2017, 20.3.2018	102	3 Off campus, 1 On campus and 1 EDP training programmes was conducted for minor millets farmers at KVK and villages.
		6	28.6.17, 27.7.17 4.8.17, 7.9.17 22.9.17, 25.10.17	117	5 off campus trainings pertaining to Nursery management in Chillies,Bellary onion and ICM practices in Coccinia,Carrot,Chillies and Bellary onion at Karkoodalpatti,Rajapalayam and Semmankadu 1 On campus training at KVK,Namakkal
		4	08.05.18,08.06.18 16.6.18,20.07.18	42	4 Off campus, 2 On campus training programmes was conducted for IPM in sugarcane farmers at KVK and villages
		3	25.07.2017, 19.09.2017 28.07.2017, 24.08.2017	81	On & Off campus training conductes at chinnathambipalayam and Kokkararayanpettai on Insitu mulching
		4		30	Imported training on crop residue utilization, EVM formulation preparation for controlling endo and Ecto parasites, EVM for RD control and Scientific Japanese quail farming
3	Media coverage	1	8.8.17	Mass	Minor millets production technology published in Kalai Kathir daily news paper on 8.8.17
		1	7.1.18	17	News on Marigold var.Arka Alankara demonstrated field at Aniyapuram, which was published in Kalaikathir daily Tamil Newspaper on 7.1.18.
		1		10	District collector visit to FLD field on Japanese quil farming
4	Training for extension functionaries	1	8.8.17	44	Minor millets productivity enhancement lecture delivered to agricultural department officials during rainfed agriculture development training at JDA office.
		2	12.05.18,13.06.18	70	Technical lecture deliverd about emerging pests and diseseas management in agricultural crops.

Performance of Frontline demonstrations

Frontline demonstrations on crops

Crop	Thematic Area	technology demonstrated	Name of the Variety/ Hybrid		No. of Farmers	Area (ha)	Yield (q/ha)				% Increase in yield	Economics of demonstration (Rs./ha)				Economics of check (Rs./ha)			
			Domo	Check			Demo			Check		Gross Cost	Gross Return	Net Return	BCR (R/C)	Gross Cost	Gross Return	Net Return	BCR (R/C)
							High	Low	Average										
Commercial crops																			
Cotton	IPM	Demonstration on IPM in cotton	Surabhi	Surabhi	10	4	22	17	19.4	15.7	23.56	51740	116160	76300	2.24	54340	103620	49280	1.90
sugarcane	IPM	Demonstration on Bio-intensive IPM module in sugarcane	CO 86032	CO 86032	10	4	63	57	59.6	55	8.36	51100	101320	50000	1.98	52350	93500	42980	1.78
Sugarcane	Nutrient Management	Insitu mulching of trashes in ratoon sugarcane with ICM practice	CO 86032	CO86032	15	6	597.8	554.5	576.1	497.6	15.77	72853	149784	76931	2.06	86186	129376	43190	1.50
Tapioca	Nutrient Management	Demonstration of split application of potassium in tapioca	Muluvadi	Muluvadi	Trial is under progress														
Millets																			
Fox tail Millet	Varietal introduction and ICM Practices	Demonstration of Foxtail millet variety CO-7 and ICM Practices	CO-7	Local traditional variety	10	4	12.4	10.25	11.62	8.12	43.10	16250	40670	24420	2.50	15250	28420	13170	1.86
Vegetables																			
Bellary onion	ICM practices with high yielding variety	ICM practices in Bellary onion var.Arka Lalima	Arka Lalima	Agri found dark red	20	1	320	240	286	235	17	93440	286000	192560	3.06	92260	235000	142740	2.54
Tomato	IPM	Demonstration of Bio-intensive pest management strategies in Tomato	K1	K1	10	4	trial is under progress												
Flowers																			
Marigold	ICM with high yielding variety	ICM practices in Marigold var.Arka Alankara	Arka Alankara	Local	5	0.4	143	112	127	108	14	125000	254000	129000	2.0	118400	432000	313600	3.6

FLD on Livestock

Category	Thematic area	Name of the technology demonstrated	No. of Farmer	No.of Units (Animal/ Poultry/ Birds, etc)	Major parameters		% change in major parameter	Other parameter		Economics of demonstration (Rs.)				Economics of check (Rs.)			
					Demo	Check		Demo	Check	Gross Cost	Gross Return	Net Return	BCR (R/C)	Gross Cost	Gross Return	Net Return	BCR (R/C)
Dairy	Nutrition Management	Crop residue as Animal feed	5	10	Milk yield 7.0 lt	Milk yield 6.0 lt	1.0 lt	Fat % 3.6	Fat % 3.4	12600	28000	15400	2.2	15600	24000	8400	1.5
Poultry	Disease Management	Ethno veterinary Medication after RD vaccination	10	250	Mortality 4%	Mortality 20%	16%	Bird weight at 4 month 1.5 kgs	Bird weight at 4 month 1.25 kgss	5000	11520	6520	2.3	5000	7500	3400	1.5
Japanese quail	General Management	Package of practices	5	2500	Mortality 2%	Mortality 20%	18%	Bird weight at 4 th week 210 gms	Bird weight at 4 th week 170 gms	7360	14700	7340	2.0	7360	9600	2240	1.3
Sheep																	
Small Ruminant	Disease Management	Ethno veterinary Medication for endo & ecto parasites	10	60	Weight at marketable age 17 kg	Weight at marketable age 11 kg	6 kgs	Lamb weight 2.0 kgs	Lamb weight 1.70 kgs	11100	30000	18900	2.7	10800	22800	12000	2.1
TANUVAS																	
Poultry	Varietal Assessment	Improved desi birds	15	300	Body weight at 4th month 1.75 Kgs	Body weight at 4th month 1.00 Kgs	100	Egg yield 180	Egg yield 80	4600	11200	6600	2.4	4800	8000	3200	1.7
NICRA																	
Dairy	Nutrition management	Onion crop residue as Animal feed	20	25	Milk yield 6.5 lt	Milk yield 6.0 lt	0.5 lt	Fat % 3.8	Fat % 3.4	12600	26000	13400	2.1	15600	24000	8400	1.5
Dairy	Nutrition management	Mixed fodder cultivation	122	250	Milk yield 8.0 lt	Milk yield 5.0 lt	3.0 lt	Fat % 4.0	Fat % 3.5	14400	31680	17280	2.2	11880	18000	8100	1.5

FLD on Fisheries

Category	Thematic area	Name of the technology demonstrated	No. of Farmer	No.of units	Major parameters		% change in major parameter	Other parameter		Economics of demonstration (Rs.)				Economics of check (Rs.)			
					Demonstration	Check		Demonstration	Check	Gross Cost	Gross Return	Net Return	BCR (R/C)	Gross Cost	Gross Return	Net Return	BCR (R/C)
Shrimp	Production Management	Demonstration On Growth Performance Of *Litopenaeus Vannamei* In Low Saline Water	2	2	Total production 3875 kg Survival % - 57.5	Total production 1698 kg Survival % - 51.0	Total production 128.20% Survival 12.74 % -	Fortnight wt-4-4.5gm	Fortnightwt-3-4gm	709905.00	1472500.00	762595.00	2.07	493210.00	644750.00	151540.00	1.30

Pig cum GIFT Tilapia	IFS	Demonstration and dissemination of Integrated fish cum Pig farming technology in Namakkal dist	3	3	Total production 1493 kg Survival % - 71	Total production 1010 kg Survival % - 51	Total production 47.82% Survival 39.21 % -	Mionthly weight 110 g	Mionthly weight 70 g	607960.00	913125.00	305165.00	1.5	493210.00	644750.00	151540.00	1.30

FLD on Demonstration details on crop hybrids (*Details of Hybrid FLDs implemented during 2017-18)*

Crop	technology demonstrated	Hybrid Variety	No. of Farmers	Area (ha)	Yield (q/ha)				% Increase in yield	Economics of demonstration (Rs./ha)			
					Demo			Check		Gross Cost	Gross Return	Net Return	BCR (R/C)
					High	Low	Average						
Vegetable crop													
Chillies	ICM practices	Arka Harita	30	0.5	38	30	32	27	15	84360	256000	171640	3.0
Other (Millets)													
Maize	TNAU Maize Hybrid COHM 6 with ICM practice	COHM6	15	3	64.98	53.05	60.08	64.37	-6.66	47600	90120	42520	1.90

FLDs conducted with the funding of other sources including CFLD/ATMA/NABARD/other ICAR institutes etc

Crop	Source of fund	Thematic Area	technology demonstrated	Name of the Variety/ Hybrid		No. of Farmers	Area (ha)	Yield (q/ha)				% Increase in yield	Economics of demonstration (Rs./ha)				Economics of check (Rs./ha)			
				Domo	Check			Demo			Check		Gross Cost	Gross Return	Net Return	BCR (R/C)	Gross Cost	Gross Return	Net Return	BCR (R/C)
								High	Low	Average										
Pulses																				
Green gram	NFSM	Varietal introduction and ICM Practices	Demonstration of high yielding green gram variety (CO-8) and ICM Practices	CO-8	VBN-3	25	10	8.55	7.35	7.96	5.47	45.5	18150	47788	29638	2.63	17360	32844	15484	1.89
Green gram	NFSM	Varietal introduction and ICM Practices	Demonstration of high yielding green gram variety (CO-8) and ICM Practices	CO-8	VBN-2	25	10	8.43	7.0	7.85	5.65	38.9	20810	47100	26290	2.26	18550	33900	15350	1.82
Black gram	NFSM	Varietal introduction and ICM Practices	Demonstration of high yielding black gram variety (VBN-6) and ICM Practices	VBN-6	CO-6	50	20	8.39	6.44	7.63	5.48	39.2	21035	45780	24745	2.17	18715	32880	14165	1.75
Oilseeds																				

Groundnut	NMOOP	Varietal introduction and ICM Practices	Demonstration of high yielding groundnut variety (CO-7/Dharani/VRI8/GJG9) and ICM Practices	CO-7/ Dharani/ VRI8/ GJG9	TMV-7	150	60	13.46	8.23	11.75	8.22	42.9	36736	77132	40396	2.09	37653	60192	22530	1.60
NICRA																				
Groundnut	NICRA CRIDA, Hyderabad	Varietal introduction and ICM Practices	Demonstration of drought tolerant groundnut variety (Dharani)	Dharani	TMV-7	10	2	12.10	9.25	10.20	8.15	25.15	33400	66000	32600	1.97	33550	55750	22200	1.66
Black gram	NICRA CRIDA, Hyderabad	Varietal introduction and ICM Practices	Demonstration of short duration black gram variety (VBN-8) & ICM Practices	VBN-8	T-9	10	4	8.10	6.98	7.90	6.10	29.50	17800	47400	29600	2.66	16300	36600	20300	2.25
Green gram	NICRA CRIDA, Hyderabad	Varietal introduction and ICM Practices	Demonstration of short duration green gram variety (CO-8) & ICM Practices	CO-8	VBN-3	20	8	8.34	7.25	8.05	6.50	23.84	14900	48300	33400	3.24	13400	39000	25600	2.91
Small onin	NICRA CRIDA, Hyderabad	Green manuring with mixed pulses	Demonstration of green manurignwith mixed pulse crops & icm practice	CO4	CO4	100	20	169.18	157.65	167.90	140.12	19.8	110256	335800	225544	3.05	100956	280240	179284	2.78
Small onion	NICRA CRIDA, Hyderabad	Seed propagated variety with drought tolerance	Demonstration of seed propagated small onion var.Co(On)5	Co(On)5	Co4	25	25	162	137	146	118	19.2	65700	219000	153300	3.3	100450	177000	76550	1.7
Small onion	NICRA CRIDA, Hyderabad	Pest and disease management	Demonstration of IPDM practices in small onion	CO4	Co4	100	40	158	124	131	112	14.5	86242	196500	110258	2.27	102475	168000	65525	1.63

4. Training Programmes

Farmers' Training including sponsored training programmes (on campus)

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
I Crop Production										
Weed Management	1	3	0	3	0	0	0	3	0	3
Resource Conservation Technologies	1	24	1	25	0	0	0	24	1	25
Cropping Systems	1	20	20	40	0	0	0	20	20	40
Crop Diversification	1	29	15	44	0	2	2	29	17	46
Integrated Farming	1	20	2	22	2	0	2	22	2	24
Seed production	1	27	4	31	2	0	2	29	4	33
Nursery management										
Integrated Crop Management	1	16	20	36	0	0	0	16	20	36
Production of organic inputs	1	13	0	13	0	0	0	13	0	13
Others (pl specify)	3	56	10	66	6	2	8	62	12	74
Total	**11**	**208**	**72**	**280**	**10**	**4**	**14**	**218**	**76**	**294**
II Horticulture										
a) Vegetable Crops										
Production of low value and high volume crops	5	131	43	174	11	9	20	142	52	194
Off-season vegetables	1	38	3	41	4	0	4	42	3	45
Others (pl specify) Roof top vegetable gardening	3	41	27	68	2	1	3	43	28	71
Total (a)	**9**	**210**	**73**	**283**	**17**	**10**	**27**	**227**	**83**	**310**
b) Fruits										
Cultivation of Fruit	2	51	1	52	7	0	7	58	1	59
Total (b)	**2**	**51**	**1**	**52**	**7**	**0**	**7**	**58**	**1**	**59**
Tuber crops										
Production and Management technology	1	21	2	23	1	2	3	22	4	26
Total (e)	**1**	**21**	**2**	**23**	**1**	**2**	**3**	**22**	**4**	**26**
III Soil Health and Fertility Management										
Integrated Nutrient Management	4	90	25	115	3	0	3	93	25	118
Production and use of organic inputs	2	26	1	27	3	0	3	29	1	30
Management of Problematic soils	1	19	1	20	0	0	0	19	1	20
Micro nutrient deficiency in crops										
Nutrient Use Efficiency	1	9	0	9	0	0	0	9	0	9
Total	**8**	**144**	**27**	**171**	**6**	**0**	**6**	**150**	**27**	**177**
IV Livestock Production and Management										
Dairy Management	1	26	2	28	2	0	2	28	2	30
Poultry Management	6	124	18	142	63	7	70	187	25	212
Piggery Management	1	31	4	35	10	8	18	41	12	53
Feed & fodder technology	3	102	11	113	11	4	15	113	15	128
Production of quality animal products	1(3days)	3	8	11	4	10	14	7	18	25
Others Sheep /Goat farming	3	117	11	128	4	0	4	121	11	132

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Infertility Management	1	10	0	10	2	0	2	12	0	12
Summer Management	1	6	0	6	0	0	0	6	0	6
Total	**17**	**419**	**54**	**473**	**96**	**29**	**125**	**515**	**83**	**598**
V Home Science/Women empowerment										
Value addition	1	20	20	40	0	0	0	20	20	40
Total	**1**	**20**	**20**	**40**	**0**	**0**	**0**	**20**	**20**	**40**
VII Plant Protection										
Integrated Pest Management	3	25	4	29	2	0	2	27	4	31
Integrated Disease Management	2	22	2	24	0	0	0	22	2	24
Bio-control of pests and diseases	2	13	36	49	5	22	27	18	58	76
Production of bio control agents and bio pesticides	1	19	5	24	1	0	1	20	5	25
Others (pl specify)	1	21	2	23	2	0	2	23	2	25
Total	**9**	**100**	**49**	**149**	**10**	**22**	**32**	**110**	**71**	**181**
VIII Fisheries										
Integrated fish farming	2	43	04	47	10	02	12	53	06	59
Carp breeding and hatchery management	1	12	00	12	04	00	04	16	00	16
Carp fry and fingerling rearing	1	16	04	20	01	00	01	17	04	21
Composite fish culture	1	07	02	09	02	00	02	09	02	11
Hatchery management and culture of freshwater prawn	1	24	02	26	04	00	04	28	02	30
Breeding and culture of ornamental fishes	1	10	03	13	01	00	01	11	03	14
Shrimp farming	3	54	04	58	06	01	07	60	05	65
Fish processing and value addition	1	14	03	17	01	00	01	15	03	18
Others (pl specify) Fish Disease and Health Management in Aquaculture Production	1	07	03	10	05	00	05	12	03	15
Pangasius culture technology	2	33	05	38	06	01	07	39	06	45
Seabass breeding and hatchery management	1	16	01	17	08	01	09	24	02	26
Total	**15**	**236**	**31**	**267**	**48**	**05**	**53**	**284**	**36**	**320**
IX Production of Inputs at site										
Bio-agents production	1	2	6	8	2	11	13	4	17	21
Bio-pesticides production	2	135	6	141	10	0	10	145	6	151
Vermi-compost production	1	11	1	12	0	0	0	11	1	12
Production of fry and fingerlings	3	60	07	67	17	01	18	77	08	85
Production of Fish feed	1	16	02	18	02	00	02	18	02	20
Mushroom Production	1	41	11	52	6	1	7	47	12	59
Apiculture	3	80	4	84	7	1	8	87	5	92
Total	**12**	**345**	**37**	**382**	**44**	**14**	**58**	**389**	**51**	**440**
XI Agro-forestry										
Production technologies	1	16	2	18	0	0	0	16	2	18
Total	1	16	2	18	0	0	0	16	2	18
GRAND TOTAL	**86**	**1770**	**368**	**2138**	**239**	**86**	**325**	**1997**	**458**	**2463**

Farmers' Training including sponsored training programmes (off campus)

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
I Crop Production										
Crop Diversification	1	29	11	40	0	0	0	29	11	40
Integrated Crop Management	9	166	96	262	17	8	25	183	104	287
Integrated nutrient management	1	6	10	16	0	0	0	6	10	16
Total	**11**	**201**	**117**	**318**	**17**	**8**	**25**	**218**	**125**	**343**
II Horticulture										
a) Vegetable Crops										
Production of low value and high volume crops	5	94	23	117	0	0	0	94	23	117
Nursery raising	4	32	33	65	0	0	0	32	33	65
Others (Roof top gardening)	1	11	7	18	0	0	0	11	7	18
Total (a)	**10**	**137**	**63**	**200**	**0**	**0**	**0**	**137**	**63**	**200**
e) Tuber crops										
Production and Management technology	9	136	18	154	47	4	51	183	22	205
Total (e)	**9**	**136**	**18**	**154**	**47**	**4**	**51**	**183**	**22**	**205**
III Soil Health and Fertility Management										
Production and use of organic inputs	3	123	32	155	0	0	0	123	32	155
Balance use of fertilizers	2	69	6	75	0	0	0	69	6	75
Total	**5**	**192**	**38**	**230**	**0**	**0**	**0**	**192**	**38**	**230**
IV Livestock Production and Management										
Dairy Management	1	0	22	22	0	28	28	0	50	50
Poultry Management	1	6	0	6	0	0	0	6	0	6
Animal Nutrition Management	1	5	6	11	2	0	2	7	6	13
Disease Management	3	21	21	42	0	0	0	21	21	42
Others - Goat/Sheep Farming	34	20	629	649	0	972	972	20	1601	1621
Summer Management	1	0	10	10	0	0	0	0	10	10
Total	**41**	**52**	**688**	**740**	**2**	**1000**	**1002**	**54**	**1688**	**1742**
VI Agril. Engineering										
Installation and maintenance of micro irrigation systems	1	15	0	15	0	0	0	15	0	15
Total	**1**	**15**	**0**	**15**	**0**	**0**	**0**	**15**	**0**	**15**
VII Plant Protection										
Integrated Pest Management	15	281	54	335	11	25	36	292	79	371
Integrated Disease Management	2	0	0	0	46	0	46	46	0	46
Total	**17**	**281**	**54**	**335**	**57**	**25**	**82**	**343**	**79**	**422**
VIII Fisheries										
Integrated fish farming	3	37	31	68	01	14	15	38	45	83
Carp breeding and hatchery management	2	28	05	33	14	01	15	42	6	48
Carp fry and fingerling rearing	1	05	03	08	15	01	16	20	04	24
Composite fish culture	3	25	150	175	00	58	58	25	208	233
Hatchery management and culture of freshwater prawn	1	14	04	18	06	02	08	20	06	26
Breeding and culture of ornamental fishes	2	23	06	29	18	06	24	41	12	53
Shrimp farming	1	02	10	12	00	00	00	02	10	12
Fish processing and value	1	21	04	25	00	00	00	21	04	25

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
addition										
Others Cage culture technology	2	35	21	56	13	08	21	48	29	77
Pangasius culture technology	1	11	00	11	00	00	00	11	00	11
Total	17	**201**	**234**	**435**	**67**	**90**	**157**	**268**	**324**	**592**
IX Production of Inputs at site										
Bio-agents production	1	13	12	25	0	0	0	13	12	25
Bio-pesticides production	1	13	12	25	0	0	0	13	12	25
Bio-fertilizer production										
Vermi-compost production	1	0	0	0	350	210	560	350	210	560
Organic manures production	1	6	27	33	0	0	0	6	27	33
Production of fry and fingerlings	2	37	07	44	12	05	17	49	12	61
Production of Fish feed	1	13	06	19	08	09	17	21	15	36
Apiculture	1	0	0	0	22	1	23	22	1	23
Total	**8**	**82**	**64**	**146**	**392**	**225**	**617**	**474**	**289**	**763**
GRAND TOTAL	**119**	**1297**	**1276**	**2573**	**582**	**1352**	**1934**	**1884**	**2628**	**4512**

Farmers' Training including sponsored training programmes – consolidated (On + Off campus)

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
I Crop Production										
Weed Management	1	3	0	3	0	0	0	3	0	3
Resource Conservation Technologies	1	24	1	25	0	0	0	24	1	25
Cropping Systems	1	20	20	40	0	0	0	20	20	40
Crop Diversification	2	58	26	84	0	2	2	58	28	86
Integrated Farming	1	20	2	22	2	0	2	22	2	24
Micro Irrigation/irrigation	0	0	0	0	0	0	0	0	0	0
Seed production	1	27	4	31	2	0	2	29	4	33
Nursery management	0	0	0	0	0	0	0	0	0	0
Integrated Crop Management	10	122	116	238	17	8	25	139	124	263
Integrated nutrient management	1	6	10	16	0	0	0	6	10	16
Production of organic inputs	1	13	0	13	0	0	0	13	0	13
Organic Agriculture	2	28	6	34	4	2	6	32	8	40
Total	**22**	**349**	**189**	**538**	**27**	**12**	**39**	**376**	**201**	**577**
II Horticulture										
a) Vegetable Crops										
Production of low value and high volume crops	10	225	66	291	11	9	20	236	75	311
Off-season vegetables	1	38	3	41	4	0	4	42	3	45
Nursery raising	4	32	33	65	0	0	0	32	33	65
Others (Roof top gardening)	4	52	34	86	2	1	3	54	35	89
Total (a)	**19**	**347**	**136**	**483**	**17**	**10**	**27**	**364**	**146**	**510**
b) Fruits										
Cultivation of Fruit	2	51	1	52	7	0	7	58	1	59
Total (b)	**2**	**51**	**1**	**52**	**7**	**0**	**7**	**58**	**1**	**59**
e) Tuber crops										
Production and Management technology	10	157	20	177	48	6	54	205	26	231
Total (e)	**10**	**157**	**20**	**177**	**48**	**6**	**54**	**205**	**26**	**231**
III Soil Health and Fertility Management										
Integrated Nutrient Management	4	90	25	115	3	0	3	93	25	118
Production and use of organic inputs	5	149	33	182	3	0	3	152	33	185
Management of Problematic soils	1	19	1	20	0	0	0	19	1	20

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Nutrient Use Efficiency	1	9	0	9	0	0	0	9	0	9
Balance use of fertilizers	2	69	6	75	0	0	0	69	6	75
Total	**13**	**336**	**65**	**401**	**6**	**0**	**6**	**342**	**65**	**407**
IV Livestock Production and Management										
Dairy Management	2	26	24	50	2	28	30	28	52	80
Poultry Management	7	130	18	148	63	7	70	193	25	218
Piggery Management	1	31	4	35	10	8	18	41	12	53
Animal Nutrition Management	1	5	6	11	2	0	2	7	6	13
Disease Management	3	21	21	42	0	0	0	21	21	42
Feed & fodder technology	3	102	11	113	11	4	15	113	15	128
Production of quality animal products	1(3days)	3	8	11	4	10	14	7	18	25
Others - Goat/Sheep Farming	37	137	640	777	4	972	976	141	1612	1753
Infertility Management	1	10	0	10	2	0	2	12	0	12
Summer Management	2	6	10	16	0	0	0	6	10	16
Total	**58**	**471**	**742**	**1213**	**98**	**1029**	**1127**	**569**	**1771**	**2340**
V Home Science/Women empowerment										
Value addition	1	20	20	40	0	0	0	20	20	40
Total	**1**	**20**	**20**	**40**	**0**	**0**	**0**	**20**	**20**	**40**
VI Agril. Engineering										
Installation and maintenance of micro irrigation systems	1	15	0	15	0	0	0	15	0	15
Total	**1**	**15**	**0**	**15**	**0**	**0**	**0**	**15**	**0**	**15**
VII Plant Protection										
Integrated Pest Management	18	306	58	364	13	25	38	319	83	402
Integrated Disease Management	4	22	2	24	46	0	46	68	2	70
Bio-control of pests and diseases	2	13	36	49	5	22	27	18	58	76
Production of bio control agents and bio pesticides	1	19	5	24	1	0	1	20	5	25
Others (pl specify)	1	21	2	23	2	0	2	23	2	25
Total	**26**	**381**	**103**	**484**	**67**	**47**	**114**	**448**	**150**	**598**
VIII Fisheries										
Integrated fish farming	5	80	35	115	11	16	27	91	51	142
Carp breeding and hatchery management	3	40	05	45	18	1	19	58	6	64
Seabass breeding and hatchery management	1	16	01	17	08	01	09	24	02	26
Carp fry and fingerling rearing	2	21	07	28	16	01	17	37	08	45
Composite fish culture	04	32	152	184	02	58	60	34	210	244
Hatchery management and culture of freshwater prawn	02	38	06	44	10	02	12	48	08	56
Breeding and culture of ornamental fishes	03	33	09	42	19	06	25	52	15	67
Shrimp farming	04	56	14	70	06	01	07	62	15	77
Fish processing and value addition	02	35	07	42	01	0	01	36	07	43
Others (pl specify) Fish Disease and Health Management in Aquaculture Production	1	07	03	10	05	00	05	12	03	15
Pangasius culture technology	03	44	05	49	06	01	07	50	06	56
Cage culture technology	2	35	21	56	13	08	21	48	29	77
Total	**32**	**437**	**265**	**702**	**115**	**95**	**210**	**552**	**360**	**912**
IX Production of Inputs at site										
Bio-agents production	2	15	18	33	2	11	13	17	29	46
Bio-pesticides production	3	148	18	166	10	0	10	158	18	176
Bio-fertilizer production										
Vermi-compost production	2	11	1	12	350	210	560	361	211	572
Organic manures production	1	6	27	33	0	0	0	6	27	33

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Production of fry and fingerlings	5	97	14	111	29	06	35	126	20	146
Production of Fish feed	2	29	08	37	10	09	19	39	17	56
Mushroom Production	1	41	11	52	6	1	7	47	12	59
Apiculture	4	80	4	84	29	2	31	109	6	115
Total	**20**	**427**	**101**	**528**	**436**	**239**	**675**	**863**	**340**	**1203**
XI Agro-forestry										
Production technologies	1	16	2	18	0	0	0	16	2	18
Total	**1**	**16**	**2**	**18**	**0**	**0**	**0**	**16**	**2**	**18**
GRAND TOTAL	**205**	**3067**	**1644**	**4711**	**821**	**1438**	**2259**	**3881**	**3094**	**6975**

Training for Rural Youths including sponsored training programmes (On campus)

Area of training	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Nursery Management of Horticulture crops	1	9	1	10	0	0	0	9	1	10
Production of organic inputs	2	2	6	8	2	11	13	4	17	21
Ornamental fisheries	3	39	12	51	08	04	12	47	16	63
Composite fish culture	2	42	16	58	7	3	10	49	19	68
Freshwater prawn culture	1	7	3	10	7	6	13	14	9	23
Shrimp farming	2	27	08	35	12	06	18	39	14	53
Fish harvest and processing technology	1	13	11	24	09	06	15	22	17	39
Fry and fingerling rearing	2	38	13	51	13	02	15	51	15	66
Any other (pl.specify) Organic Agriculture Oranic fish production and the standads	4	60	10	70	4	4	8	64	14	78
TOTAL	**18**	**237**	**80**	**317**	**62**	**42**	**104**	**300**	**222**	**422**

Training for Rural Youth including sponsored training programmes (Off campus)

Area of training	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Nursery Management of Horticulture crops	1	15	16	31	0	0	0	15	16	31
Mushroom Production	1	12	6	18	6	2	8	18	8	26
Bee-keeping	1	0	0	0	18	2	20	18	2	20
Ornamental fisheries	2	55	13	68	04	01	05	59	14	73
Composite fish culture	1	27	00	27	11	00	11	38	00	38
Freshwater prawn culture	2	52	11	63	21	09	30	73	20	93
Shrimp farming	2	42	21	63	18	06	24	60	27	87
Fish harvest and processing technology	2	31	21	52	08	13	21	39	34	73
Fry and fingerling rearing	2	29	20	49	14	12	26	43	32	75
Any other (pl.specify) Management Strategies for Reservoirs Fisheries	3	79	19	98	50	20	70	129	39	168
TOTAL	**17**	**342**	**127**	**469**	**150**	**65**	**215**	**492**	**192**	**684**

Training for Rural Youths including sponsored training programmes–consolidated (On+Off campus)

Area of training	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Nursery Management of Horticulture crops	2	24	17	41	0	0	0	24	17	41
Production of organic inputs	2	2	6	8	2	11	13	4	17	21
Mushroom Production	1	12	6	18	6	2	8	18	8	26
Bee-keeping	1	0	0	0	18	2	20	18	2	20
Ornamental fisheries	5	94	25	117	12	5	17	106	30	136
Composite fish culture	3	69	16	85	18	3	21	87	19	106
Freshwater prawn culture	3	59	14	73	28	15	43	87	29	116
Shrimp farming	4	69	29	98	30	12	42	99	41	140
Fish harvest and processing technology	3	44	32	76	17	19	36	61	51	112
Fry and fingerling rearing	4	67	33	100	27	14	41	94	47	141
Any other (pl.specify) Management Strategies for Reservoirs Fisheries	4	96	24	120	54	22	76	150	46	196
TOTAL	**35**	**579**	**207**	**786**	**212**	**107**	**319**	**792**	**314**	**1106**

Training programmes for Extension Personnel including sponsored training programmes (on campus)

Area of training	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Productivity enhancement in field crops	7	168	84	252	28	21	49	196	105	301
Integrated Pest Management	6	140	105	245	7	3	10	147	108	255
Livestock feed and fodder production	1	30	6	36	3	1	4	33	7	40
TOTAL	**14**	**338**	**195**	**533**	**38**	**25**	**63**	**376**	**220**	**596**

Training programmes for Extension Personnel including sponsored training programmes (off campus)

Area of training	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Productivity enhancement in field crops	2	52	28	80	21	13	34	73	41	114
Integrated Pest Management	2	35	15	50	4	9	13	39	24	63
TOTAL	**4**	**87**	**43**	**130**	**25**	**22**	**47**	**112**	**65**	**177**

Training programmes for Extension Personnel including sponsored training programmes – consolidated (On + Off campus)

Area of training	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Productivity enhancement in field crops	9	220	112	332	39	34	73	259	146	405
Integrated Pest Management	6	140	105	245	7	3	10	147	108	255
Production and use of organic inputs	2	35	15	50	4	9	13	39	24	63
Livestock feed and fodder production	1	30	6	36	3	1	4	33	7	40
TOTAL	**18**	**425**	**238**	**663**	**53**	**47**	**100**	**478**	**285**	**763**

Sponsored training programmes

Area of training	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production and management										
Commercial production of vegetables-ATMA	2	8	53	61	1	13	14	9	66	75
Production and value addition										
Spices crops– Protray Nursery techniques For Turmeric – Dept of Hort,Namakkal	1	15	0	15	0	0	0	15	0	15
Others -Organic Agriculture	1	17	7	24	4	0	4	21	7	28
Others –Oragnic farming & certification (Paid)	1	13	0	13	0	0	0	13	0	13
Others - Organic Roof Top Gardening	1	22	7	29	1	0	1	23	7	30
Others - Roof Top Gardening (Paid)	2	28	23	51	0	0	0	28	23	51
Others – recent Vegetable cultivation techniques (Paid)	1	8	25	33	1	1	2	9	26	35
Others- Nursery management	1	25	4	29	0	1	1	25	5	30
Others-Apiculture and mushroom cultivation	1	0	0	0	0	22	22	0	22	22
Total	**9**	**128**	**66**	**194**	**6**	**24**	**30**	**134**	**90**	**224**
Post harvest technology and value addition										
Others - Nursery production of horticultural crops under shade net condition - Tamil Nadu Pudhu Vazhvu Thittam	1	9	7	16	0	7	7	9	14	23
Livestock and fisheries										
Livestock production and management	1 (2 days)	10	35	45	0	0	0	10	35	45
Fisheries Management	1	12	05	17	02	04	06	14	09	23
Others - Production of quality animal products	1 (3 days)	3	8	11	4	10	14	7	18	25
Total	**3**	**25**	**48**	**73**	**6**	**14**	**20**	**31**	**62**	**93**
GRAND TOTAL	**15**	**170**	**174**	**344**	**13**	**58**	**71**	**183**	**232**	**415**

Name of sponsoring agencies involved

1. ATMA, Namakkal
2. Department of Horticulture,Namakkal
3. Pudhuvazhvu Project,Chennai
4. NABARD,Chennai
5.By apid training mode

Details of vocational training programmes carried out by KVKs for rural youth- Nil

5. Extension Programmes

Activities	No. of programmes	No. of farmers	No. of Extension personnel	Total
Advisory Services	76	4912	188	5100
Diagnostic visits	106	302	49	351
Field Day	9	290	40	330
Group discussions	29	473	31	504
Kisan Ghosthi	0	0	0	0
Film Show	86	4484	86	4570
Self -help groups	10	194	6	200

Kisan Mela	3	791	26	817
Exhibition	21	9225	119	5662
Scientists' visit to farmers field	296	817	51	868
Plant/animal health camps	7	187	6	193
Farm Science Club	1	15	0	15
Ex-trainees Sammelan	2	40	5	45
Farmers' seminar/workshop	3	1530	75	1605
Method Demonstrations	39	1163	124	1289
Celebration of important days	7	285	55	340
Special day celebration	1	39	3	42
Exposure visits	19	979	31	1010
Others - Guest lectures delivered	43	3423	397	3795
Awareness programme	5	514	32	546
Total	**763**	**29663**	**1324**	**27282**

Details of other extension programmes

Particulars	Number
Electronic Media (CD./DVD)	0
Extension Literature	43
News paper coverage	40
Popular articles	50
Radio Talks	21
TV Talks	15
Animal health amps (Number of animals treated)	7 (1304)
Others (pl. specify) Booklet Research articles Neswletter	 5 4 4
Total	**181**

Messages sent

MOBILE ADVISORY SERVICES THROUGH MKISAN PORTAL - NIL

MOBILE ADVISORY SERVICES THROUGH OTHERS

Types of	Type of messages													
Messages	Crop		Livestock		Weather		Marketing		Awareness		Other enterprise		Total	
	No of messages	No of farmers	No of messages	No of farmers	No of messages	No of farmers	No of messages	No of farmers	No of messages	No of farmers	No of messages	No of farmers	No of messages	No of farmers
Text only	11	175	16	42	132	5325	11	22	18	113			188	5677

6. DETAILS OF TECHNOLOGY WEEK CELEBRATIONS - Nil

7. PRODUCTION OF SEED/PLANTING MATERIAL AND BIO-PRODUCTS

Production of seeds by the KVKs

Crop	Name of the crop	Name of the variety / hybrid	Quantity of seed produced (q)	Value (Rs)	Seed supplied to farmers		Supplied to other agencies (q)
					Quantity (q)	No. of farmers	
Oilseeds	Groundnut	CO-7, GJG-9	26.25	144375	26.0	65	-
Pulses	Green gram	CO-8	0.25	2750	0.20	5	-
	Black gram	VBN-6	0.65	7150	0.45	8	-
	Red gram	VBN-3	0.35	4550	0.24	45	-
Vegetables	Arakeerai	Co1	0.0527	5270	0.0527	112	-
	Mulaikeerai	Co1	0.0369	3690	0.0369	78	-

	Radhish	Pusa Chetki	0.0561	5610	0.0561	43	-
	Ribbed gourd	PKM1	0.0909	9090	0.0909	153	-
	Palak	Ooty 1	0.0733	7330	0.0733	75	-
	Bottle gourd	Arka Bahar	0.0939	9390	0.0939	152	-
	Thandukeerai	Co1	0.0634	6340	0.0634	72	-
	Lablab	CoGB14	0.1277	12770	0.1277	182	-
	Annual moringa	PKM1	0.01089	10890	0.01089	85	-
	Ash gourd	Co1	0.0426	4260	0.0426	32	-
	Sirukeerai	Co1	0.0481	4810	0.0481	41	-
	Cluster bean	Pusa Navbahar	0.058	5800	0.058	62	-
	Tomato	PKM1	0.0574	5740	0.0574	47	-
	BhendI	Arka Anamika	0.1223	12330	0.1223	120	-
	Bittergourd	C12	0.097	9700	0.097	142	-
	Snake gourd	Co2	0.0885	8850	0.0885	75	-
	Chillies	K1	0.0579	5790	0.0579	64	-
	Mesta	Green	0.0828	8280	0.0828	134	-
	Brinjal	Varikathiri	0.0544	5440	0.0544	87	-
	Pumpkin	Chittu	0.0227	2270	0.0227	36	-
	Vegetable cowpea	PKM1	0.0158	1580	0.0158	27	-
	Small onion	Co(On)5	0.8	208000	0.8	80	-
Fodder crop seeds	Fodder Sorghum	COFS 29 / COFS 31	118.33	4733200	105.0	3429	10.0
	Fodder Sorghum	CO-27	3.5	22750	3.5	7	3.00
	Hedge Lucerne	CO-2	22.43	1121500	16.0	290	4.56
	Agathi	Sesbania	5.03	251500	4.0	1470	1.23
	Subabul		3.04	91200	1.95	1260	-
	Fodder Cowpea	CoFC-8	5.7	85500	2.34	74	-
	Fodder cowpea	EC152	0.52	7800	0.52	25	-
	Fodder Maize	African Tall	14.12	112960	12.2	389	1.20
	Cenchrua (Anjan grass)	Local	3.00	90000	2.55	136	-
	Stylosanthus	CO-1	2.15	75250	1.20	24	0.80
	Lucerne	CO-2	1.55	85250	1.15	13	0.45
Total			**232.09**	**7148165**	**205.85**	**9239**	**21.24**

Production of planting materials by the KVKs

Crop	Name of the crop	Name of the variety / hybrid	Number	Value (Rs.)	Planting material supplied to farmers		Supplied to other agencies (No)
Vegetable seedlings	Annual Moringa	PKM1	25	500	25	5	-
	Tomato	Shivam	41	41	41	4	-
Fruits	Mango	Alphonso	2236	222500	234	72	2002
	Mango	Banganapalli	156	15300	156	63	-
	Mango	Imam Pasand	122	12150	122	41	-
	Mango	Bangalora	22	2000	22	18	-

	Mango	Neelum	7	400	7	7	-
	Mango	Sendura	26	2600	26	20	-
	Acid lime	Balaji	1013	101300	733	84	280
	Pomegranate	Bagawa	193	19300	193	110	-
	Sapota	PKM1	189	12180	189	112	-
	Jamun	Jumbo	240	222000	240	48	-
	Manilla Tamarind	Local	25	1200	25	25	-
	Custard apple	Local	422	21100	22	25	400
	Mandarin orange	Kodur 1	101	10100	101	84	-
	Sweet orange	Kodur1	166	16600	166	115	-
	Amla	NA7	110	5500	110	47	-
	Jack	PLR1	46	6900	46	40	-
	Guava	L49	515	25700	515	38	-
	Fig	Timla	65	6500	65	60	-
	Papaya	Co2	18	450	18	3	-
Ornamental plants	Neerium	Pink	243	4935	243	5	-
Medicinal and Aromatic	Coleus		9	180	9	9	-
Plantation	Coconut	Wast coat tall	1658	82900	1658	150	-
Spices	Tamarind	PKM1	49	2450	49	7	-
Fodder crop saplings	Cumbu Napier grass	CO-4	32700	16350	32700	27	-
Forest Species	Teak	Local	1005	15180	19	10	986
	Neem	Local	1293	25935	243	64	1050
	Pungam	Local	48	720	48	30	-
Others	Ailanthus	Local	440	11000	2	2	438
Total			**10486& 32700 setts**	**863971**	**5327 & 32700 setts**	**1325**	**5156**

Production of Bio-Products

Bio Products	**Name of the bio-product**	**Quantity kg**	**Value (Rs.)**	**Supplied to farmers**		**Supplied to other agencies (kg)**
				kg	**No. of farmers**	
Bio Fertilizers	Azospirillium	218	13220	218	124	-
	Phosphobacteria	497	13375	497	405	-
	Rhizobium	55	2585	55	53	-
	Azolla	65.5	4885	65.5	131	-
	Total	**835.5**	**34065**	**835.5**	**713**	**-**
Bio-pesticide	Neem oil (lit)	64.5	25700	64.5	25	10
	Pungam oil (lit)	6.25	1900	6.25	15	10
	Pest repellent (lit)	185	7830	185	54	10
	Panchakaviyam (lit)	598	59800	598	200	200
	Amirtha karasil (lit)	118.5	11855	118.5	45	-
	Themor karasil (lit)	8	800	8	5	-
	Inchi pondu karasil (lit)	82	8200	82	15	-
	Muttai karasil (lit)	6	600	6	3	-

	Jeevamirtham (litr)	8	800	8	4	-
	Total	**1076.25**	**117485**	**1076.25**	**366**	**230**
Bio-fungicide	Trichoderma viride (kg)	384	46080	384	155	200
	Pseudomonas fluorescens (kg)	345	41400	345	160	200
	Beauveria bassiana (kg)	124	24300	124	45	50
	Trichoderma harzianum (kg)	182	21840	182	68	150
	Metarhizium (kg)	37	7020	37	12	25
	VAM (kg)	108	12960	108	89	50
	Total	**1180**	**153600**	**1180**	**529**	**675**
Bio Agents	Acerophaus (no)	3982	3982	3982	450	1500
	Trichocard egg	120	7200	120	120	10
	RB lure (no)	6	1080	6	3	2
	Water trap (no)	65	6500	65	15	25
	Brinijal lure (no)	10	200	10	5	5
	Fruit fly trap (no)	27	4220	27	20	10
	Lucin lure (no)	21	315	21	9	10
	Funnel trap (no)	8	600	8	5	5
	TLM lure (no)	14	260	14	10	5
	BACW lure (no)	11	660	11	6	2
	Yellow sticky trap (no)	172	9860	172	75	25
	Pheromone Trap - Funal	100	5500	100	68	25
	ESB lure (no)	10	300	10	6	0
	INB lure	50	1500	50	25	0
	Pectin lure (no)	25	500	25	20	0
	Blue sticky trap	33	1815	33	15	5
	Pheromone trap (no)	117	12200	117	25	10
	Spoda Lure (no)	75	1350	75	30	25
	Heli-lure (no)	183	2915	183	50	25
	RPW lure (no)	15	1125	15	7	5
	Coconut pvc trap-with lure (no)	1	1800	1	1	1
	Total	**1063**	**59900**	**1063**	**515**	1580
Others- Beekeeping	Honey bee+ hive (no)	44	85400	44	44	-
	Honey (kg)	112.25	45240	112.25	80	-
	Honey extractor(no)	7	8500	7	7	-
	Smoker (no)	6	1350	6	6	-
	Bee hives only (no)	6	5100	6	6	-
	Gloves	1	30	1	1	-
	Bees only (no)	1	900	1	1	-
Others-Mushroom	Mushroom	84.23	3043	84.23	15	-
	Mushroom spawn	13	585	13	2	-

Others- Vermicompost	Vermicompost	4095	40950	4095	505	-
Other –Earthworms	Vermiworms	27.50	11000	27.50	24	-
Others- Crop booster	Arka Banana Special	168	30240	168	72	-
	Arka vegetable Special	155	27900	155	155	-
	Arka Mango Special	13	2380	13	13	-
	Pulse wonder	188	2880	188	90	-
	Groundnut rich	118	7640	118	26	-
	Cotton plus	25	6000	25	4	-
	Sugarcane booster	29	11930	29	5	-
	Total	**696**	**88970**	**696**	**365**	**-**
Micronutrient mixtures	Paddy Mn mixture	5	315	5	1	-
	Maize Mn Mixture	90	6300	90	15	-
	Cotton MN mixture	25	2350	25	2	-
	Sugarcane Mn Mixture	100	6500	100	2	-
	Coconut Mn Mixture	40	4800	40	4	-
	Millets Mn Mixture	125	8750	125	25	-
	Total	**385**	**29015**	**385**	**49**	-
Roof Top Gardening Kit	Roof Top Gardening Kit	3	900	3	3	-

Production of livestock materials

Particulars of Live stock	**Name of the breed**	**Number**	**Value (Rs.)**	**Supplied to farmers**		**Supplied to other agencies (No.)**
				No.	**No. of farmers**	
Dairy animals						
Calves	Cross bred Jersey	4	60000	-	-	-
Others – Goat	Tellicherry cross	40	145108	10	6	1
Sheep	Mecheri	13	63950	5	3	-
Poultry	Desi chicken	15518	602000	14518	520	21
Duals (broiler and layer)	Gramapriya Vanaraja	6785	149270	6785	120	1
Desi	Kadaknath	50	15000	-	-	-
Turkey	Broad chested bronze cross	19	16690	15	11	1
Ducks	White Peckin	16	3487	10	6	-
Others- Guinea fowl	-	24	4844	19	15	-
Piggery						
Piglet	Yorkshire cross	5	15000	-	-	-
Others (Pl.specify)	Yorkshire cross	6	52600	4	2	-
Micro Nutrient Supplements	Mineral block	950	69500	711	405	4
	Mineral mixture	4200	173250	3150	2450	6
Fisheries						
Indian carp	IMC	500	750	-	1	-

Particulars of Live stock	Name of the breed	Number	Value (Rs.)	Supplied to farmers		Supplied to other agencies (No.)
				No.	No. of farmers	
Others (Pl. specify)	GIFT	1000	2000	-	2	-
	Ornamental fish	300	3000		60	
Total		**29430**	**1376449**	**25227**	**3601**	**34**

8. DETAILS OF SOIL, WATER AND PLANT ANALYSIS

Samples	No. of Samples	No. of Farmers	No. of Villages	Amount realized (Rs.)
Soil	600	323	125	81225.00
Water	171	133	111	28315.00
Total	**771**	**456**	**236**	**109540.00**

9. SCIENTIFIC ADVISORY COMMITTEE

Date of SAC meeting	Number of members attended
07.11.2017	50

10. PUBLICATIONS

1. Publications in journals

S.No	Authors	Year	Title	Journal
1.	Sharmila Bharathi,C.,B.Mohan and N.Akila	2017	Integrated pest and disease management for sustainable small onion production in Ramanayakanpatti village of Namakkal District.	International Referred Research Journal – Asian Journal of bio science 12(1):26-31.
2.	Sharmila Bharathi,C. and B.Mohan	2017	Drought tolerant jasmine (*Jasminum sambac*) cultivation as a crop diversification for livelihood security and resilience to climate variability.	International Journal on Trends in Bio sciences. 10(19):3483 - 3489.
3.	Sharmila Bharathi,C. and B.Mohan	2018	Integrated Pest and Disease Management in Small onion at NICRA village in Namakkal District of Tamil Nadu.	International Journal on Multilogic in Science. Vol.7 (Special Issue): 403-407.
4.	Sharmila Bharathi,C. and B.Mohan	2018	Community small onion/Multiplier onion (*Allium cepa* var *aggregatum*) nursery as a contingency measure for delayed planting in NICRA village of Namakkal District, Tamil Nadu, India.	International Journal of Current Microbiology and Applied Sciences.7(3) : 403-407.
5.	Kalaiselvi Beeman, S.Sathya and K.Arulmozhiselvan	2018	Comparative evaluation of ammonia volatilization between deep placed and surface applied fertilizers in soil	International Journal of Chemical Studies, 2018, 6(1): 92-96
6.	Daisy,M., K. Rajendran and M. Mohamed Amanullah	2017	Effect of Legume Fodder Intercrops and Different Fertilizer Levels on Growth, Yield and Economics of Bt Cotton under Irrigated Condition	Int.J.Curr.Microbiol.App.Sci., 2017, 6(7),
7.	Daisy,M., K. Rajendran and M. Mohamed Amanullah	2018	Effect on Microbial Population, Quality Parameters and Green Fodder Yield of Leguminous Crops under Bt Cotton Intercropping System	Int.J.Curr.Microbiol.App.Sci., 2018, 7(1):
8.	Daisy,M., K Rajendran, K Senthilkumar and R Sureshkumar	2018	Effect of increased level of fertilizers on *Bt* cotton and green fodder yield under cotton + legume fodder intercropping system of western zone of Tamil Nadu	International Journal of Chemical studies 2018, 6(2): 184-187
9.	Daisy, M., and K. Rajendran	2017	Seed Cotton Yield of Bt Cotton as Influenced by Cotton Based Legume Fodder Intercropping System with Different Fertilizer Levels under Irrigated Condition	Int. J. Pure App. Biosci. **5 (6)**
10.	Daisy,M. and N. Thavaprakaash	2018	Influence of SCI Practices on Yield, Nutrient Uptake and Oil Yield of Castor (*Ricinus communis* L.) *var*: YRCH-1	Int. J. Pure App. Biosci. 6 (1)

			under Irrigated Condition of Western Zone of Tamil Nadu	
11.	Senthil Kumar, K. and M Daisy	2018	Effects of concentrate supplementary feeding on performance growth and reproduction in local goats	International Journal of Chemical studies 2018; 6(2):

2.Other publications

S.No	Item	Year	Authors	Title	Publisher
1	Books	-	-	-	-
2	Book chapters / Manuals	-	-	-	-
3	Training manuals	2017	Arulmozhi,A. and S.Paulpandi	Aquatic Animal disease, Health care management	VC&RI campus, Namakkal
		2018	Murugan, P., C.Sankar and N.Akila	Organic Agriculture	KVK, Namakkal
4	Conference, proceeding papers, **Popular articles**, Bulletins, Short communications	**Popular Articles**			
		2017	Akila, N.	Silage making	Kalakkathir Tamil Daily
				Concentrate feeding in male calf for profitable dairying	
				Gramma priya & Vanaraja	
			Sharmila Bharathi,C. and N.Akila	Drought management in fruit crops.	
				Drought management techniques in Coconut and Arecanut	
				Off season cultivation of coriander under shadenet condition	
				Recent production techniques in small onion	
				Cultivation techniques of Tomato for Kharif season	
				Quick wilt management in Pepper	
				Cultivation practices of small onion var .Co(On)5	
			Murugan, P. and N.Akila	Minor millets production technology	
				Integrated farming system	
			Sankar, C. and N.Akila	IPM in cotton	
				Mushroom cultivation	
				Pink bollworm management in Cotton	
			Sathya, S. and N.Akila	Tips to improve the productivity in mango	
			Jothilakshmi, M. and N. Akila	Hydrophonic fodder cultivation	
				Improved varieties of native chicken rearing	
				Ways and means to control economic loss of Mastitis in dairy animals	
			Paulpandi, S. and N.Akila	Ornamental fish culture	
				Seabass culture	
				Commercial Murrel Culture in Namakkal dist	
				Shrimp culture in inland low salinity waters	
				GIFT Tilapia culture	

		2018	Paulpandi, S. and N.Akila	Supplementation of potassium, magnesium and sodium chloride in practical diets for the Pacific white shrimp, *Litopenaeus vannamei*, reared in low salinity waters	
			Sathya,S. and N.Akila	Importance of soil testing	
				Integrated nutrient management practice for pulse	
				Balanced fertilization for soil fertility improvement and crop productivity	
			Jothilakshmi, M. & N.Akila	Ethno Veterinary Medicine for livestock and poultry	
			Akila, N. and M.Jothilakshmi	Strategies to prevent kid mortality	
		2017	Sankar, C. & N.Akila	Integrated nematode management Vegetables	Dinamalar Tamil Daily
				Technology in Honey bee rearing	
			Akila,N.	Krishi Vigyan Kendra, Namakkal	Nilavalam, Tamil Magazine
			Sharmila Bharathi,C.	Drought management techniques in perennial crops	Pachai Boomi,Tamil Magazine
			Sharmila Bharathi,C. and N.Akila	Mulching and low cost irrigation techniques for fruit crops	Naveena velanmai – Tamil Magazine
			Sharmila Bharathi,C. and N.Akila	Group approach for marketing of hybrid tomato with premium price-Farmers success story	
			Sharmila Bharathi,C. and N.Akila	Production techniques for seed propagated small onion	
			Sharmila Bharathi,C. and N.Akila	Annual moringa cultivation techniques	
			Sharmila Bharathi,C. and N.Akila	Farmers success story on Integrated Farming System	
			Sharmila Bharathi,C. and N.Akila	Roof Top Gardening techniques for vegetable crops	
			Sathya,S., N.Akila and B.Kalaiselvi	Nutrient management for sustainable production of coconut	Agrobios Newsletter-English Magazine
			Kalaiselvi,B. & S.Sathya. 2017	Gloriosa superba: A supernatural medicinal plant.	
			Kalaiselvi Beeman, M. Lalitha and S.Sathya.	Sensible Use of Soil Nutrients for Crop Productiion. Indian farmers .	Indian farmers-English Magazine
			Sathya,S., N. Akila & B. Kalaiselvi	Composting of Plant Residues for Soil Fertility Improvement.	
			Kalaiselvi Beeman, S.Sathya & M.Chandrakala	Soil Acidity- A Potential Threat for Soil Productivity	
			Sathya, S. & N.Akila	Strategies to improve the soil fertility	Agricultural technology booklet of KVK, Namakkal
			Jothilakshmi, M. & N. Akila	Cross bred desi bird rearing	
			Sharmila Bharathi,C. and N.Akila	Kitchen gardening	
			Murugan, P and N.Akila	Recent technologies in crop production	
			Sankar, C. and N. Akila	Honey bee rearing techniques	
			Paulpandi,S. and N.Akila	Integrated fish farming system	

6	Reports		Akila, N., C.Sharmila Bharathi, P. Murugan, C. Sankar, M.Jothilakshmi, S.Paulpandi S.Sathya & M.Daisy	NICRA Smart Practices – Research Highligts (2011-2016) Technology Demonstrations – Enhancing resilience and adaptive capacity of farmers to climate variability: Highlights 2015-16 of NICRA TDC	KVK,Namakkal
			Sharmila Bharathi,C. and N.Akila	Community nursery in small onion **for** delayed monsoon	
			Sharmila Bharathi,C. and N.Akila	Pudhuvazhvu training report on Shandenet nursery cultivation	
				NADP training report on Protray Nursery techniques in Turmeric	
				Report on training cum awareness programme on Protection of plant varieties and farmers right act 2001,held at Kollihills	
				NABARD training report on Roof top gardening	
				NABARD training report on Nursery management in horticultural crops	
			Murugan, P. and N.Akila	Report on New India Manthan – Sankalp Se Siddhi programme	
				Report on Cluster FLD on Kharif pulses 2017-18	
		2018	Murugan, P. and N.Akila	Report on Cluster FLD on Rabi pulses 2017-18	
				Report on Skill training of Rural youth on Organic Agriculture	
		2017	Sathya, S. and N. Akila	KVK annual report	
				SAC report (Tamil & English)	
				ICAR Action plan & NICRA action plan	
				KVK monthly report	
				World soil day report	
		2018	Akila, N. and M. Jothilakshmi	Skill Training Report on Piggery Farmer	
			Jothilakshmi, M. and N. Akila	Skill Training Report on Small Poultry Farmer	
				TNLDA Farmers orientation Programme Phase I	
				TNLDA Farmers orientation Programme Phase II	
7	Others-Booklet	2017	Sharmila Bharathi,C., N.Akila and R.Prabhakaran	Nursery raising of horticultural crops under shadenet condition	KVK, Namakkal
			Sharmila Bharathi,C. and N.Akila	Protray Nursery techniques and Cultivation practices in Turmeric	
			Sharmila Bharathi,C. and N.Akila	Recent production techniques in Vegetable crops	
			Sharmila Bharathi,C. and N.Akila	Roof Top Vegetable Gardening techniques.	
			Sharmila Bharathi,C. and N.Akila	Propagation techniques and Nursery management in horticultural crops.	
			Sharmila Bharathi,C., N.Akila,P.Murugan, C.Sankar,	Protection of Plant Varieties and Farmers Right Act - Glance	

			M.Jothilakshmi, K.Paulpandi, S.Sathya and M.Daisy		
			Murugan, P. and N.Akila	Manual on Agricultural technology	KVK, Namakkal
			Jothilakshmi,M. and N. Akila	Booklet on Feeding and Breeding Management for profitable dairying	Sponsoring Agency –TNLDA
		2018	Murugan, P., N.Akila C.Sharmila Bharathi,C.Sankar, M.Jothilakshmi S.Paulpandi and S.Sathya	Manual on Protection of plant varieties and Farmers right act	KVK, Namakkal
8	Others Research Abstracts	2017	Sharmila Bharathi,C. and L.Pugalendhi	Canopy management and chemical manipulation to induce off season flowering and fruiting in Annual Moringa (*Moringa oliefera* Lam)	Book on National conference on New vistas in Vegetable research towards nutritional security under changing climate scenario TNAU,CBE.
			Murugan, P., A.Velayutham and M. Mohammed Amanullah	Effect of organic and inorganic source of nutrients on yield attrubutes and yield of groundnut (Arachis Hypogaea L.)	Extncon 2017 - National Conference compendium
		2018	Sharmila Bharathi C., B.Mohan and N.Akila	Sustainability, livelihood security and resilience to climate variability of small holders through vegetable and flower cropping in NICRA village of Namakkal District. Pp.No.7	International conference on Recent Scenario in plant science, Research, climate change and its associated variation, Department of Botany, Annamalai University, Chidambaram
			Jothilakshmi,M. and N. Akila,	Technology delivery through FFS	INTFES 2018 - International Conference compendium, TNAU, Coimbatore
			N.K.Sudeepkumar, N.K.,G.Senthilkumar and M.Jothilakshmi	Women Empowerment through Livestock based CLGs in TamilNadu	
			Murugan, P., A.Velayutham and N.Akila	Demonstration of potential technologies for enhancing yield in groundnut	
10	Pamphlets	2017	Jothilakshmi, M. & N. Akila	Bag Silage making using Crop residue	KVK, Namakkal
				Unconventional feed resources for livestock	
				Clean milk Production methods	
				Mastitis prevention methods	
				Total mixed ration preparation methods for drought management	
				Japanese quail rearing	
				Ethno Veterinary Medicine for livestock and poultry diseases	
				Desi chicken and Improved desi chicken Rearing	
				Dairy farming	

				Sheep & Goat farming	
				Summer Management of Livestock & poultry	
				Alternative Poultry farming	
			Sathya, S. and N.Akila	Importance of soil and water testing	
				Role of macro nutrients, its deficicncy symptoms and their corrective measures	
				Role of micro nutrients, its deficicncy symptoms and their corrective measures	
				Application of crop boosters and micronutrient mixtures for crop productivity and soil fertility improvement	
				Strategies to improve the soil fertility under rainfed condition	
		2018	Murugan, P. and N.Akila	Production technology of new paddy variety CO-51	
				Minor millets production and value addition technology	
				Integrated crop management practices in Groundnut	
				Recent techniques in pulses production	

Newsletter/Magazine

Name of News letter/Magazine	**Frequency**	**No. of Copies printed for distribution**
KVK newsletter English	Quartely	100
KVK newsletter Tamil	Quartely	100

3.Training/workshops/seminars etc details attended by KVK staff

Name of the staff	Title	Duration	Institution and location
DrN.Akila Dr.P.Murugan	Annual Review 2016-17 cum Action plan 2017-18 workshop for NICRA Scheme	1 day 13.07.2017	Central Research Institute for Dryland Agriculture, Hyderabad
Dr.N.Akila Dr.P.Murugan Dr.M.Jothilakshmi	International Conference on Invigorating Transformation of Farm Extension towards Sustainable Development : Futuristic Challenges and Prospects	2 days 09.03.2018 to 10.03.2018	Tamil Nadu Agricultural University, Coimbatore
Dr.N.Akila	National Conference for KVK and Krishi Unnati Mela	3 days 16.03.2018 to 18.03.2018	Indian Agricultural Research Institute, PUSA Campus, New Delhi
	Workshop on climate resilient practices	1 day 20.03.2018	Indian Counsil of Agricultural Research Main campus, New Delhi
Dr.C.Sharmila Bharathi	Training programme on Biogas Technology	4 days (24.8.2017 to 27.8.2017)	Biogas Development and Training Centre, Agricultural Engineering College and Research Institute, Tamil Nadu Agricultural University, Coimbatore
	National conference on New vistas in Vegetable research towards nutritional security under changing climate scenario (NCVR 2017	4 days (06.12.2018 to 09.12.2017)	Horticultural College and Research Institute Campus, TNAU, Coimbatore.
	ICAR Sponsored short course on New perspectives in fruit crops research	10 days (05.03.2018 to 14.03.2018)	Department of Fruit Crops, Horicultural College & Research Institute, Tamil Nadu Agricultural University, Coimbatore.

	International conference on Recent Scenario in Plant Science Research – Climate change and its associated variations	3 days 24.03.2018 to 25.03.2018	Department of Botany, Annamalai University, Chidambaram
Dr.P.Murugan	International Symposium on Sugarcane Research Since CO-205: 100 Years and Beyond	4 days 18.09.2017 to 21.09.2017	Le Meridian Hotel, Coimbatore
	Vigilance awareness workshop	1 day 01.11.2017	Directorate of Extension Education, Tamil Nadu Agricultural University, Coimbatore
	Winter School training on "Sustainable organic production practices – an approach to mitigate climate change and rural livelihoodsecruity"	21 days 01.12.2017 to 21.12.2017	University of Agricultural Sciences, Gandhi Krishi Vigyan Kendra Campus, Bengaluru, Karnataka
	Regional workshop on farmers rights and Agro biodiversity	1 day 27.01.2018	Professor Jayashankar Telangana State Agricultural University, Hyderabad
	Agro-forestry Models : Establishment and Management	3 days 29.01.2018 to 31.01.2018	Institute of Forest Genetics & Tree Breeding (IFGTB), Coimbatore
	The preparation of State Extension work plan for SSEPERS - ATMA for the year 2018-19	3 days 21.02.2018 to 23.02.2018	Hotel Golden Resort, Kodaikanal
Th.C.Sankar	Plant Bio-Security - Quarantine pests: Detection & Identification	21days 04.04.2017 to 24.04.2017	National Institute of Plant Health Management, Hyderabad,
	Entomology workshop	One day	Agricultural College & Research Institute, Tamil Nadu Agricultural University , Madurai
Dr.S.Sathya	Orientation training programme for the newly recruited Assistant Professors of TANUVAS	10 days 05.03.2018 to 15.03.2018	Madras Veterinary College, Chennai
Dr.S.Paulpandi	Orientation training programme for the newly recruited Assistant Professors of TANUVAS	10 days 05.03.2018 to 15.03.2018	Madras Veterinary College, Chennai
Dr.M.Jothilakshmi	Advanced analytical techniques for decision making in agriculture	21 days 07.07.2017 to 30.07.2017	National Institute of Agricultural Economics & Policy Research, New Delhi
	Good practices in quantitative social science research: A journey from conceptualization to research application	6 days 07.08.2017 to 12.08.2017	Central Tuber Research Institute, Thiruvanthapuram, Kerala
	Ethno veterinary practices in livestock and poultry	2 days 27.12.2017 to 28.12.2017	Poultry Disease Diagnosis and Surveillance Laboratory,Vetrinary College & Research Institute, Namakkal

11. Details on rain water harvesting structure and micro irrigation system : nil

12. Interventions on disaster management/unseasonal rainfall/hailstorm/cold waves etc

Introduction of alternate crops/ varieties

Crops/cultivars	Area (ha)	Extent of damage	Recovery of damage through KVK initiatives if any
Small onion /Multiplier onion var.Co(On)5	125	10	In Vadavathur village failure of rain and prolonged dry spells in November – December, as sowing of small onion is delayed which resultant adverse affect on productivity. Delay in sowing of small onion affects productivity in terms of delayed sprouting,

			slow growth of vegetative phase and reduction in yield. The existing practice has led to use of high seed rate (Totally 12.5 – 15.0 q of seed bulb is required for small onion cultivation in an area of 1 hectare), high cost involved for seed purpose (Rs. 25000 – 30,000 / ha) and also timely sowing during rainy season due to deficit rainfall. To mitigate these problems, KVK,Namakkal demonstrated low seed rate (1 kg/0.4 ha) variety which withstand drought during bulbing stage, ready availability of seedlings for transplanting at the time of rainy period to establish quickly with minimum rains and often wait for transplanting in rainfed areas till end of December in anticipation of rains.

Major area coverage under alternate crops/varieties

Crops	Area (ha)	Number of beneficiaries
Oilseeds		
Grounndut – Var. Dharani	22.0	110
Grounndut – Var. CO-7	10.0	25
Grounndut – Var. VRI-8	1.0	5
Pulses		
Green gram – Var. CO-8	20.0	50
Cereals		
Millets		
Foxtail millet – CO-7	4.0	10
Vegetable crops -Small onion /Multiplier onion var.Co(On)5	32	80
Total	**89**	**280**

Farmers-scientists interaction on livestock management

Livestock components	Number of interactions	No.of participants
Dairy Feeding management	1	500
Dairy Breeding management	1	500
Total	2	1000

Animal health camps organised

Number of camps	No.of animals	No.of farmers
7	RDVK vaccination for Poultry -387 Deworming Cattle-184 Small Ruminant-721 Treatment -12	187
Total	**1304**	**187**

Seed distribution in drought hit states

Crops	Quantity (qtl)	Coverage of area (ha)	No.of farmers
Grounndut – Var. CO-7	11.5	10.0	25
Grounndut – Var. VRI-8	2.0	1.0	5
Green gram – Var. CO-8	4.20	20.0	50
Black gram – Var. VBN-6	4.15	20.0	50
Foxtail millet – CO-7	0.50	4.0	10
Fodder sorghum – COFS 31	0.30	6.0	15
Sorghum – PC 23 & CO-27	2.00	4.0	11
Total	**24.65**	**65**	**166**

Large scale adoption of resource conservation technologies : NIL

Awareness campaign

	Meetings		Gosthies		Field days		Farmers fair		Exhibition		Film show	
	No.	No.of farmers	No.	No.of farmers	No.	No.of farmers	No.	No.of farmers	No.	No.of farmers	No.	No.of farmers
	4	155			3	80			2	842	3	345
	2	1000			1	30			7	2800	44	2981
Total	**6**	**1155**	**0**	**0**	**4**	**110**	**0**	**0**	**9**	**3642**	**47**	**3326**

13. Awards/rewards by KVK and staff

Recognitions &Awards/Special attainments and Achievements of Practical Importance

Recognitions & Awards (Team Award/individual)

Item of Recognition	Year	Awarding Organization National / International / Professional; Society	Individual/ collaborative
Awarded second place in poster presentation during National conference on New vistas in Vegetable research towards nutritional security under changing climate scenario (NCVR 2017)	December 2017	Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore. National	Individual - Dr.C.Sharmila Bharathi Assistant Professor (Horticulture), KVK,Namakkal
Awarded best oral presentation Award for a paper on Women Empowerment through Livestock based CLGs during international conference on Invigorating Transformation of Farm Extension towards sustainable Development: Futuristic Challenges and Prospects (INTFES2018)	March 2018	Society of extension Education Tamil Nadu Agricultural University, Coimbatore.	Individual Dr.M.Jothilakshmi Assistant Professor (Animal Science), KVK,Namakkal
Awarded best oral presentation Award for a paper on Technology Delivery through FFS for Clean Milk Production during international conference on Invigorating Transformation of Farm Extension towards sustainable Development: Futuristic Challenges and Prospects (INTFES2018)			

Special Attainments & Achievements of Practical Importance (patents, technologies, varieties, products, concepts, methodologies etc.)

Category	Title	Year	Individual/ Collaborative	Additional Details/Information
Products	Enriched onion crop residue- as alternative animal feed	2017	Dr.N.Akila & Dr.M.Jothilakshmi	The unutilized onion crop residues were ensiled and converted in to low cost alternative feed for better animal productivity during climate vagaries
Methodology	Development of Community Veterinary Health Workers		Dr.M.Jothilakshmi & Dr.N.Akila	Equipping selected community representatives with livestock and poultry health care knowledge and skill to improve the health status of animals for mitigating climatic stress.

14. Details of sponsored projects/programmes implemented by KVK

S.No.	Title of the programme / project	Sponsoring agency	Objectives	Duration	Amount (Rs)
1.	Shadenet nursery cultivation	Pudhuvazhvu Thittam under Microenterprises establishment programme	To create employment opportunities for technical, skilled, semi-skilled and unskilled beneficiaries from Pudhu Vazhvu Project. To impart skill on plant propagation methods pertaining to fruits Vegetables, Spices, Medicinal and Tree crops under shade net condition and the entrepreneurial skills required to run a small scale commercial nursery for new entrepreneur.	3 days 4.04.2017 to 06.04.2017	51,359.00
2.	Protray nursery techniques in Turmeric	State Department of Horticulture under National Agricultural Development Programme	To create awareness about nursery raising of turmeric sapling with low seed rate in protrays under shade net condition. To impart skill on recent production techniques in turmeric pertaining to seed rhizome production techniques for new varieties, Rapid multiplication techniques, fertigation, intercropping and mulching,	4 days 8.05.2017 to 11.05.2017	15,000.00
3.	Training cum awareness programme on	Protection of Plant varieties and Farmers	To create awareness on collection, conservation and to get patent for Native species of cultivated crops.	One day 30.11.2017	80,000.00

	Protection of Plant varieties and Farmers Right Act	Right Authority, Ministry of Agriculture, Government of india, New Delhi			
4.	NABARD Sponsored CAT Programme on Organic Roof Top Vegetable Gardening	NABARD, Chennai	To create awareness about organic roof top vegetable gardening To enhance the year round organic vegetable cultivation in roof top by adopting recent technical methods To impart skill on recent production techniques in vegetables in roof top by effective recycling of household waste.	3 days 12.12.2017 to 14.11.2017	57,000.00
5.	NABARD Sponsored CAT Programme on Nursery Production and Management of Fruits and Vegetable Crops	NABARD, Chennai	To create awareness about nursery production techniques for horticultural crops To impart a skill on plant propagation methods pertaining to fruits and vegetable crops and the entrepreneurial skills required to run a small scale commercial nursery for new entrepreneur	3 days 19.12.2017 to 21.12.2017	52,500.00
6.	New India Manthan – Sankalp Se Siddhi	ICAR	To create awareness cum seminar on doubling the farmers income	One day 28.08.2018	73,812.00
7.	Skill training of Rural Youth	MANAGE, Hyderabad	To create awareness on organic farming practices and organic certification	6 days 12.02.2018 to 17.02.2018	42,000.00
8.	Training cum awareness programme on Protection of Plant varieties and Farmers Right Act	Protection of Plant varieties and Farmers Right Authority, Ministry of Agriculture, Government of India, New Delhi	To create awareness on protection of traditional plant varieties, conservation and registration of Native species of cultivated crops and live telecast of Prime Minister address to farmers	One day 17.03.2018	80,000.00
9.	World soil day 2017	ICAR	To create awareness among the farmers about soil health	One day 05.12.2017	80,000.00
10.	Micro enterprises training on Coffee/milk/cool drinks outlet	Puthuvazhu thittam,Namakkal ,Karur and puthukottai	To impart knowledge and skill on milk product preparation	3 days 3.05.2017 to 05.05.2017	62,920.00
11.	TNLDA Phase-I Farmers Orientation Programme	TNLDA	To impart knowledge and skill on scientific feeding practices to get higher conception rate in dairy animals	1 day 06.07.2017	50,000.00
12.	TNLDA Phase-II Farmers Orientation Programme	TNLDA	To impart knowledge on infertility management and to educate innovative technologies to get one calf per year	1 day 15.12.2017	50,000.00
13.	Village Adoption Programme	TANUVAS	To improve the overall development of the village	1 year 2017-2018	10,000.00
14.	Integrated Livestock farming based Livelihood and Entrepreneurial training to Srilankan Refugees	OfEER NGO	To impart Knowledge on IFS based livelihood to resettle at their native country	2 days 01.03.2018 to 02.03.2018	9000.00

14a. Details of special programmes implemented by KVK

S.No.	Title of the programme	Objectives	Place	Duration
1	Mahila Kisan Diwas	To appreciate the tole of women in Agriculture	Aniyapuram Pudur	16.10.2017
2	Vigilance awareness week	To create the awareness among the farmers about corruption free India	KVK, Namakkal	31.10.2017-04.01.2017
3	World Fisheries Day	To create awareness amon the farmers about fish rearing for their livelihood		21.11.2017
4	Pesticide awareness programme	To create awareness among the farmers about safe and judicious use of fertilizers		11.12.2017
5	Constitution day	To take condtitution plede by staff members of KVK in front of office		27.11.2017

15. Success stories

1. Farmers participatory varietal demonstration in groundnut in namakkal district

Situation analysis / Problem statement

Groundnut is an important oilseed crop grown in kharif and Rabi season in Namakkal district. The farmers of Namagiripettai block of Namakkal district have being growing for many years with available local seeds (namely TMV-7 and local seeds). Groundnut production system suffering from many problem like lower yields, destructive pest and diseases, un assured rainfall, labour intensive, unstable market price and more importantly old varieties in cultivation and non availability of improved quality seeds. The productivity of TMV 7 having low vigour, viability and susceptible to many of the pest & disease and poor yield. In addition to this most of the farmers are not following the recommended package of practices for its cultivation which reflects on the yield & quality of groundnut. The yield loss upto 35% due to cultivation of low yielding susceptible variety. A total area of groundnut cultivation in namakkal district is 27292 ha in both the seasons. The average yield of groundnut pods are 656 kg/ha due poor withstand in drought, pest and disease incidence and repeated cultivation of low yielding varieties. Hence there is immediate need to replace old cultivars with new improved varieties. With this particular view, Krishi Vigyan Kendra, Namakkal analyzed the constraints and organized several trainings and group discussion & meetings on its improved cultivation practices with special emphasis on use of newly developed variety along with complete package of practices. KVK Namakkal selected R.Pudupatti village to conduct cluster front line demonstration to overcome on above issues. The village is located at 11.49^0 N latitude and 78.27^0 E longitude with average rainfall of 455 mm in 18 rainy days (rabi season – north eastern monsoon). Maximum monthly mean temperature was 33.4^oC and minimum was 21.1^oC.

Plan, Implementation and Support (KVK Intervention)

The Krishi Vigyan Kendra (KVK), Namakkal has taken steps for alternate variety against the ruling varieties like TMV-7 and other local varieties through cluster front line demonstration with farmers participatory and other mandatory programmes in collaboration with state department of agriculture during last two years.

- A few progressive farmers (10 farmers) among the groundnut growers were selected in R.Pudupatti village as per ICAR norms to conduct cluster front line demonstration along with local check
- Imparted Off campus training on improved groundnut production technology to the CFLD beneficiaries
- Introduction of new groundnut variety (CO-7 and VRI-8) by supplied 400 kgs of seeds as critical input
- Demonstrated seed treatment and soil application with pseudomonas
- Demonstrated foliar spray of Groundnut Rich @ 5kg/ha
- Organized exposure visit to growing areas
- Farmers – Scientist Interaction meet.
- Diagnostic field visit for pest and diseases management
- Hands on training on rouging and other seed production practices
- Distributed Booklet / Pamphlets on groundnut production technology
- Tie up arrangement with agriculture department for seeds production

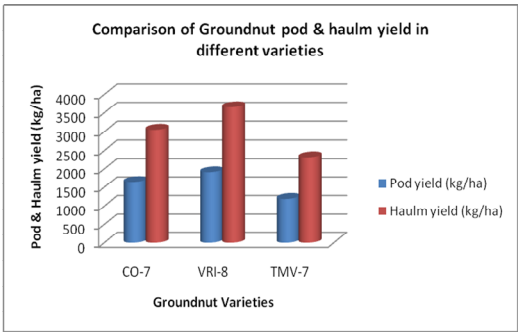
Output

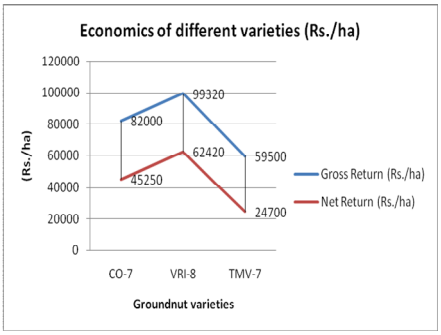
The yield attributes and biometric observation data recorded from different farmers field in cluster front line demonstration at R.Pudupatti village during cropping period. The average yield and yield attributes presented in Table 1.

Table 1: Average yield, pest and disease incidence and economic parameters recorded in demo plot at R.Pudupatti village during 2017-18

Parameters	*Groundnut variety (CO-7)*	*Groundnut variety (VRI-8)*	*Groundnut check variety (TMV7)*
Germination (%)	95.0	93.4	86.0
Plant population (Plants/m.sq)	31.4	31.0	28.2
Root rot incidence (%)	2.1	1.8	6.1
Spodoptera pest incidence (%)	3.1	2.6	4.4
Tikka early leaf spot (%)	2.2	2.0	5.3
Number of pods per plant	27.2	24.6	17.8
100 kernel weight (g)	43.3	54.5	42.2
Pod yield (kg/ha)	1640	1910	1190
Market price (Rs./kg)- dry pods	50	52	50
Farmers acceptance (%)	92	96	75
Haulm yield (kg/ha)	3050	3650	2320
Gross cost Rs.	36750	36900	34800
Gross return Rs.	82000	99320	59500
Net return Rs.	45250	62420	24700
BCR	2.23	2.69	1.71

- ✓ The demonstration results revealed that plant population was more than 90% in demonstration plot (VRI-8 and CO-7) with good vigour where as low vigour in the local check (TMV-7). The better plant population with good vigour, more number of pods per plant and drastic reduction in leaf spot and rust disease in VRI-8 variety.
- ✓ The root rot disease incidence was brought down to 2% in the demonstration plot as against 6.1 in the local check.
- ✓ As a result the beneficiaries under the demonstration could harvest on average of 1910 kg/ha in VRI-8 and 1640 kg/ha in CO-7 as against an average yield of 1190 kg/ha in the check plot.
- ✓ Farmer were very keen in their choice, as groundnut is dual purpose crop, farmer is not only looking for yield and also for quality and quantity of haulm. The varieties VRI-8 and CO-7 recorded higher haulm yield than local variety coupled with resistance to pest and diseases.
- ✓ Regarding to economic parameters, groundnut variety VRI-8 obtained higher net income (Rs.62420.ha) due to more plant population, more number of pods and 100 kernel weight followed by CO-7 variety (Rs.45250/ha).
- ✓ The newly selected cultivars were high yielder coupled with desirable traits contributes to optimum cost of cultivation as they were resistant to many biotic and biotic stresses and in turn increases the net profit.





Outcome

- ✓ The beneficiaries of groundnut demonstration appreciated the interventions made by the KVK and the technology was disseminated to other farmers through extension activities such as field day, which was organized at R.Pudupatti village on demonstration plot.
- ✓ A few of the farmers exchanged their views on the success of the demonstration, the beneficiaries realized that the improved package of practices along with quality of new variety seeds.

- ✓ The outcome of the demonstration was really encouraging. Farmers were very happy with VRI-8 and CO-7 variety.

Impact

- ✓ KVK intervention had lead to effective changes through various activities in groundnut production with new variety. 10 ha area (25 farmers) was taken up sowing of groundnut new variety CO-7 and VRI-8 in current season (Kharif 2018) for further horizontal spread.The CFLD beneficiaries shared the new variety seeds to nearby farmers for cultivate in next season. Over years farmers have expressed great satisfaction on the performance of this variety (VRI-8) with respect to describe traits such as higher yield, higher selling percentage, good quality fodder, high oil content and fetches higher price (Rs.52/kg) have contributed to its popularity in the district. The CFLD beneficiary sold the seeds (3000 kgs) to KVK, Namakkal for horizontal spread of next season. In coming years it's going to occupy larger area under cultivation in the district.

2. Quick wilt management in black pepper in kollihills of namakkal district

Situation analysis/Problem statement

Black pepper (*Piper nigrum*) is one of the important spice crop grown in Kollihills of Namakkal district in an area of 635 ha with a productivity of 0.2 tonnes/ha. Kollihills received an average annual rainfall of 1440 mm distributed fairly over two season's *viz.,* south west and north east monsoons. The maximum temperature rarely exceeds 32^0C and the minimum beyond 14^0C. Soil type is red/lateritic and 95 per cent of the area is under rainfed.The pepper is mainly affected by quick wilt/foot rot disease caused by *Phytophthora capsici*. This disease became very severe during October to January, which resulted 50 – 90 % of drying of pepper vines and 90 % reduction in pepper yield. 250 vines maintained per acre. Being a soil borne pathogen, the fungus infected all parts of the plant. Infection at the collar region resulted in sudden wilting, defoliation and death of vines..

Plan, Implement and support

On Farm Testing (OFT) was carried out in 25 farmers field covering in an area of 4 hectare during 2015 -16 at Koochikiraipatti village of Kollihills by KVK,Namakkal. OFT programme consisted of three management practices *viz.,* farmers practice, recommended practice and alternate practice.

Farmers practice

In farmers practice, drenching of Copper oxy chloride (COC) was carried out. Initially they dissolved the COC @ 2.5gm/litre of water and applied @ 2-3litres of solution/vine. Then 10 days after COC application, they applied butter milk solution prepared by means of diluting 10 litres of butter milk in 10 litres of water. From this 500ml of diluted butter milk was applied per vine at 2 months interval.

Recommended practice

Second method (Recommended practice) was carried out during onset of monsoon and applied Trichoderma harzianum around the base of the vine @ 50g/vine.

Alternate practice

The alternate practice was implemented by cut the lower leaves and branches up to ½ meter and applied 20 kg of FYM, 1kg of neem cake with 50 gm Trichoderma harzianum per vine. Then mulched the base of the vine with 1.25m2 mulch tightly around the collar region of the vine. Each treatment was imposed in 100 vines.

Support rendered by KVK

To implement the demonstration at Koochikiraipatti, KVK provided Neem cake, mulching sheet and Trichoderma harzianum as a critical input to 25 farmers.

Apart from this, technology also popularized by means of regular advisories field visit by KVK scientists and training to pepper farmers. The success of the technology also conveyed to the farmers by means of two farmers scientist interface meeting arranged by Department of Horticulture and Department of Agriculture at Semmedu,Kollihills. In addition, 10 % of the farmers from Kochikiraipatti have started to purchase Trichoderma harzianum from KVK,Namakal on cost basis and applied to the plantations regularly.

Output

Major results of the major parameters

Parameters	Farmer practice	Recommended Practice	Alternate practice
Soil temperature before solarization (^{0}C)	19.2^{0}C	19.2^{0}C	23.6^{0}C
Soil temperature – 3,6 & 9 weeks after solarization at 10 cm depth	21.4^{0}C (3 weeks) 23.8^{0}C (6 weeks) 26.3^{0}C (9 weeks)	21.4^{0}C (3 weeks) 23.8^{0}C (6 weeks) 26.3^{0}C (9 weeks)	25.8^{0}C (3 weeks) 27.0^{0}C (6 weeks) 29.4^{0}C (9 weeks)
Phytophthora capsici population	18.78		

percent before imposing treatment.			
Phytophthora capsici population percent – 3,9 & 15 weeks after imposing treatment.	32.13 37.60 31.69	18.96 13.63 19.13	13.76 8.23 12.08
Population of Trichoderma spp x 10^3 – Before imposing treatment.	2.46		
Population of Trichoderma spp x 10^3 – 9 weeks and 15 weeks after imposing treatment.	3.43 5.78	27.41 46.72	36.68 95.43
Yield/ vine (5 years old)	2.1 kg	2.5 kg	3 – 5.5 kg

Before initiating the experiment, population of *Phytophthora capsici* (18.78 percent) and *Trichoderma* spp (2.46 x 10^3) were recorded. After imposing the treatments, population of *Phytophthora capsici on 3rd* week (32.13 percent at 21.4^{0}C , 18.96 percent at 21.4^{0}C, and 13.76 25.8^{0}C percent), 9th week (37.60 percent at 23.8^{0}C, 13.63 percent at 23.8^{0}C, and 8.23 percent at 27.0^{0}C) and *15th week* (31.69 percent at 26.3^{0}C, 19.13 percent at 26.3^{0}C, and 12.08 percent at 29.4^{0}C) were recorded.

The alternate practice was the best treatment and resulted in maximum survival of vines 89.72 per cent where as 25.56 percent in recommended practice and 9.17 per cent in farmers practice respectively. The population of *P. capsici* was reduced to 8.23 percent from 37.60 per cent (Farmers practice). Also, there was considerable increase of *Trichoderma* spp population from 3.43 x 10^3 to 95.43 x 10^3 which have suppressed *P.capsici* with their antagonistic effect and control the disease effectively.

The farmers from Koochikiraipatti village now gained the knowledge on method of quick wilt management, quantity of T.harzianum application, time of application and its benefit. By implementing this technology, Farmers felt that 80 % reduction of quick wilt incidence was achieved through this technology and also they got the yield of 3- 3.5 kg of black pepper from 7 years old vine/year when compared to 2.5 and 2.1 kg in farmer and recommended practice respectively. The farmers sold the black pepper @ Rs.700/kg and got a net profit of Rs.3,75,000/- with a B:C ratio of 3.5.

Outcome

After seeing the success of the technology, Department of Horticulture, Namakkal district has taken up quick wilt management technology implemented through OFT in Kollihills under Hill Area Development Programme and supplied Trichoderma harzianum and neem cake to the pepper farmers during 2015 -2016 in an area of 120 acres. Hence this technology was popularized in Ariyur Nadu, Thanimathipatti, Valarppur Nadu and Thinannur Nadu village of Kollihills and successfully adopted by 76 farmers. Now 8 % of the pepper cultivating farmers in Koochikiraipatti village used bio inputs such as T.viride and T.harzianum for the management of quick wilt and also saved up to 12000/- towards purchase of pesticide and fungicide. In whole sale market the farmers sold the pepper @ Rs.700/kg and in retail market they sold up to Rs.850/kg.

Impact

In Koochikiraipatti village, area of pepper cultivation extended from 132 acres to 210 acres in last 3 years as a replacement crop for coffee and tapioca due to price fall in tapioca and coffee (Rs.210/75 kg bag in Tapioca & Rs.50/kg in coffee beans). 8 % of pepper growers were adopted this technology and the farmers also got an additional yield of 0.2 to 0.25 kg/vine. Pepper processing and packing units developed by Pudhuvazhuvu Thittam and MSSRF in Kollihills created good marketing facility for the pepper growers. So the farmers got better economic returns thus helped to educate their children in the good colleges.

3.Uses of bio agents in small onion

Background

Devarayapuram is the village comes under the Erumapatti block where general cropping is growing for Groundnut, cotton, Tapioca, brinjal, chillies crops and they are getting low income Rs.45000 per year/ha. There were two reasons in the village that they expressed the labour scarcity was a problem in general, more number of pesticide spray(6 spray/ crop) for their existing crops which incurred higher expenditure (Rs.3000/per crop) as another problem. Hence, people of the village expressed the need of better alternate crop of short duration and more income during a visit by KVK scientist to the area. KVK conducted many follow up meetings and interactions with the farmers by forming a formal group having 20members.

Process

1. Group formation
2. Exposure Visit
3. Training

4. Demonstration
5. Farmers group discussion

IPM technology

- Demonstration of CO-4 Onion
- Growing two rows of maize as barrier crops around field border.
- Selection of healthy onion seed bulbs.
- Bulb treatment –*Pseudomonas fluorescens* (5 g/kg) + *Trichoderma viride* (5 g/kg)
- Soil application of *P.fluorescens* (1.25 Kg/ha) + *T.viride* (1.25 kg/ha) + *AM Fungi* (VAM) (12.5 kg/ha) + *Azophos* (4kg/ha) + Neem cake 250 kg/ha.
- Installation of Yellow sticky traps 12/ha for thrips and leaf miner trapping.
- Installation of Pheromone traps 12/ha for cut warm (*S.litura*).
- Foliar application of P.fluorescens (5 g/l) + Beauveria bassiana (10 g/l) on 30 DAP.
- Foliar application of Azadairachtin 1% (2 ml/l) on 40 DAPS.
- Need based application of Profenophos (2 ml/l) or Dimethoate (2 ml/l) or Triazophos(2ml/l) for thrips/leaf miner/cut worm management.

KVK scientist made a preliminary reconnaissance survey in the village to assess the general cropping situation and the package of practices followed. With such baseline information, introduced the small onion crop along with the Bioagents to the group members trying initially with 5 members in specified trials along with IPM technology. The initial effort taken by the 5 members got good income (0.87lakhs/acre)with low expenditure (Rs 35,000/) from the small onion crop in short duration. This sparked and gathered the attention of other members also to follow such cropping system with bulbs treatment of Bio agents with IPM technology. About 40 members of the same village immediately reacted to such cropping change and started requesting for seed and Bioagents arrangement from KVK. Seeing the situation KVK arranged the Bio agents and traps. The Seed materials were purchased especially the variety CO-4 from chatharamanai village, perambalur district. This was an arrangement done in a strategic way to enable and involve the respective farmer group to outsource such seed materials on their own. The enabling guidelines were given by KVK often as per requirement.

Input for technological intervention

Besides arranging a situation for varietal introduction to the area, KVK conducted periodical meetings with the group and conducting Training, Demonstration, Advisory service, Exposure visit etc. During the course, the members reported that the bulb rot as emerging problem in their small onion field. Based on the problems expressed, the scientist from KVK made an assessment study to find out the cause for the bulb rot and found that the 'improper storage system' as a cause to the particular disease. To rectify the problems it was recommended to treat the bulbs with *Pseudomonas* and *Trichoderma vride* @ 10gms per liter of water. They were also advised with proper storage system and this would solve the rotting problem. In the main field affected plants exhibit gradual drying of leaves along the margins. This ultimately resulted in complete drying of all the leaves. The basal portion of the bulb appears watery and soft. The root system was very much reduced and its tissues also affected. In advanced stage the infection spread to bulbs which decompose and turn into a decaying mass at tissues. The bright orange colour at the bulb changed into different shades of brown. Further the affected bulb become soft. The development of bulb would be very poor. So KVK scientists recommended bulb treatment –*Pseudomonas fluorescens* (5 g/kg) + *Trichoderma viride* (5 g/kg) and Soil application of *P.fluorescens* (1.25 Kg/ha) + *T.viride* (1.25 kg/ha) + *AM Fungi* (VAM)(12.5 kg/ha) + Azophos (4kg/ha) + Neem cake 250 kg/ha as basal and top dressing in 25DAS and also foliar spraying bioagent @ 2% with other technology. Under the demonstration bulb rot infestation was drastically reduced up to 5%.

Output

Each farmer realized an yield range of 6.5 to 8 tons per acre and income of Rs.1,35,000 to Rs.1,80,000/- and the expenditure was Rs.35, 000 to Rs.45, 000 only and hence the net profit was 1to 1.25 lakh /acre. All the small onion farmers got the similar benefits in terms of yield and return. Such benefit binding their relationship and took collective decision/actions in selling their product to particular outside market

Impact

Horizontal spread

Initially the technology was demonstrated in one village of Devarayapuram, Erumapatti block. Further it was extended to 60ha (85 farmers) in near villages and 180ha (150 farmers) in all blocks of Namakkal district.

Among these Mr. K.Chinnathambi s/o kandasamy is a marginal farmer living in the same village used to cultivate different crops in his farm years together. But he could not realized sufficient income in his farm, mainly due to pesticide cost. He tried many ways but could overcome the situation and left crop cultivation without any option. But his income status became very low. He was selected as one of the trainee farmers under KVK plan and had participated in various training activities conducted by KVK. IPM technology became a perfect

solution for his problems and used it to circumvent his recession period. He started cultivation of small onion in his lands and reaped bumper yield of 6.5 to 9t/acre realizing good net return (Rs.1, 58,000/acre) in three season. Of late, this helped him to support his son's school study. His agriculture scenario changed with purchase of more farm support systems like Tractor, Rotovator , etc. Small onion cultivation has helped him to recover from dwindling living status towards income stabilization and prosperous livelihood condition.

S. No	Year and Month	Yield / T/ ac	Rate / kg	Income	Expenditure	Net income
1.	2016 - June	6.5	25	1, 62,500	75,000	87,500
2.	2016 - Nov	9.8	20	1,96,000	35,000	1,61,000
3.	2017 – June	5.9	45	2,65,500	40,000	26,15,500
Average		**7.4**	**30**	**2,08,000**	**50,000**	**1,58,000**

Employment Generation

Regularly offered employment to one male and one female labour for Bulb treatment , bioagents application and storage.

4. Oestrous synchronization in dairy animals in namakkal district

Introduction, problem statement, possible solution

Reproductive performance plays a major role in determining the profitability of dairy farms. Poor fertility is probably the most economically important animal health issue - the average loss is around Rs.12, 157per cow. These losses have increased since the start of the century, as in most parts of the world, including India. In a recent survey conducted in Tamil Nadu state, it was found that only 35 per cent of cows and buffaloes were pregnant as against a desirable level of 70 per cent; around one third of cows and buffaloes were infertile because of anoestrus or repeat breeding. This means that out of 50 lakh breedable cows and buffaloes available in Tamil Nadu, around 15 lakh are infertile. So introduction of infertility management suitable to that area helps to achieve an ideal interval of one calf per year.

Intervention

Dairy cattle in rural areas of Namakkal generally suffer from two major reproductive conditions - Anoestrus condition or failure of coming to heat (20 – 30 %) and Repeat Breeding or repeated failure to conceive (around 10 %). Group discussion was conducted with Veterinary Assistant Surgeons of Namakkal district; areas with more infertile dairy animals such as Oruvanthur puthur of Namakkal district, Kalangani and Thathiripuram villages from puthuchatram and Valiyapatti of Erumapatti blocks of Namakkal district were selected.

In this scenario KVK, Namakkal was conducted one OFT and one Technology refinement programme for identifying suitable estrous synchronization programme to overcome bovine infertility.

Under TANUVAS funded OFT programme on Estrous synchronisation was carried out in 2016-17 at Oruvanthur village of Namakkal district in dairy animals. Six cross bred Holstein fresien, four graded buffaloes and ten cross bred jersey dairy cows were selected based on the reproductive history. All the cows were treated with GnRH and cloprostenol.

In ICAR funded technology refinement programme, two technologies such as TRIUB and Vaginal Sponge were used for oestrous synchronization programme in 40 animals at Valayapatti(10 animals), Kalangani (17animals),Thathiripuram (13 animals).

In the above interventions, dairy owners persuaded to adopt infertility treatment to their dairy animals which found expedient compared to feeding infertile animal without reproductive performance. Four off campus trainings were conducted to enrich the farmers' knowledge in infertile management and oestrous detection, extension literature in infertile management was distributed, consultancy was given through phone and office calls regarding post insertion care of TRIUB/ Vaginal sponge.

Results

The conception rate of 70% was achieved and manifested in three ways, viz., improving fertility and reduction of inter-calving period that can be measured by the success rate of AI and improvement of milk production. In this Ovi-SYn programme, Synchronization of oestrus can be accomplished with the injection of prostaglandin F2a alone, but it needs proper detection of the ovarian status of the cows as prostaglandin F2a is active in only functional corpus luteum in between 8 to 17 days of estrous cycle

In technology refinement, results revealed that, 85 % in TRIUB and nearly 85.15 % in vaginal sponge in infertile cows and buffaloes. It improved conception rate by 20-25 % and reduced calving interval.

The most important outcome is that 34 cows and buffaloes had become pregnant out of 40 synchronized. Induction of heat was almost 100 % and 90 % in anoestrus (not coming to heat) and repeater cows and buffaloes respectively. A conception rate of 85% achieved in mostly infertile cows and buffaloes are a significant feat.

In addition the unsuccessful animals (6 animals) were got pregnant in the next consecutive cycle

Productivity and Economic returns of estrous synchronization Techniques

Technology Assessed /Refined	Pregnancy Rate (%)	Gross cost (Feed +treatment) (in Rs. / unit)	Gross return /Lactation (in Rs. / unit)	Net Return /Lactation (in Rs. / unit)	BC Ratio
Control	40-50	72450	76000	3550	1.04
Technology option 1 : Hormone treatment	70	60000	90000	30000	1.5
Technology option 2: TRIUB insertion	85	65300	115000	10700	1.8
Technology option 3: Vaginal sponge	85.15	62050	116000	10950	1.9

The farmers were saved from maintaining unproductive animals for a long time and they earned more income because of more days of milk production. The reduction in inter-calving interval would result in 30 - 40 % increase in milk production from an individual animal. This would help to meet the increase in demand for milk and also help to control price inflation.

Extension aspects and brief outcome

KVK, Namakkal was conducted various activities to popularize estrous synchronization programme through training, method demonstration and celebrating Parturition day. The activities taken up by the KVK in spreading know-how and imparting technical guidance has helped in increasing the number of farmers adopted infertility management in the district. Around 350 animals successfully become pregnant in Namakkal by estrous synchronization programme.

Outcome

Field Veterinarians of Namakkal district are practicing validated estrous synchronization protocol to overcome bovine infertility (350 animals treated in 2017) among the dairy farmers.

Impact

The estrous synchronization programme will be resulted in improvement of milk production by 25,920 litres (48 cows calving x 90 milking days x 6 lit/day) in the production cycle of animals. This improvement in milk production comes without increasing the number of animals and exerting pressure on animal feed resources. In addition, this could salvage at least 20- 30 % of cows and buffaloes from going to slaughter as unproductive animals. An on average of Rs. 15,000 was saved by a dairy farmer for maintaining unproductive animals and productivity loss was saved and utilized for essentials such as education of siblings and health care.

15. B. Give details of innovative methodology or innovative technology of Transfer of Technology developed and used during the year

Innovative methodology

Many blocks of Namakkal district is drought prone area and get sufficient income from crop cultivation is very difficult due to uncertainty of rainfall during crop growth period. Farmers getting additional income from dairy farming to met out the crop cultivation expenses. Most of the dairy farmers have cultivating green fodder in a small area for their fodder requirement. Similarly But the gap in availability of quality vegetable seeds/ Planting materials is still wide open. An attempt has been made by KVK, Namakkal to encourage Livestock/Agricultural farmers to produce quality fodder seeds and buy back arrangement has been made from farmers, which will be tested for quality and supplied to needy farmers/departments through KVK under PUBLIC PRIVATE PARTNERSHIP MODE.

S.No	Methodology	Total qty of Seed / Planting material supplied	Amount realised (Rs.)	No. of farmers signed MOU
1.	Public Private Partnership mode in Fodder seeds	Fodder seeds (Fodder Sorghum. CoFS 29, CO31, Hedge lucerne, Fodder Cowpea, Subabul, Agathi, Fodder maize-African tall, Lucerne, Cenchrus, stylosanthus seeds) – 15,989 kgs	62,35,000	65
2	Public Private Partnership model in purchase and supply of Fruit saplings, Planting materials, Flower crops and Ornamental flowers	Fruit saplings & other Planting materials: 8776 Nos Vegetable seed : 2.15 quimtal Micronutrient mixtures:339 kg	11,76,021/-	12

Innovative Technologies Adopted in Livestock Instructional Units for effective dissemination

S.No.	Particulars	Year	Source	Technology
1	Small ruminants	April 2017	TANUVAS – URF	**Low Cost Feeding Rack for Goats** ➢ Low cost wooden feeding rack for goats reared under Intensive system of rearing to maintain their browsing nature (habitat) / during summer in Semi intensive system when animal not sent for grazing ➢ Easily to carry and transport and prevents wastage of fodder (Prevent soiling of fodder with dung and urine) ➢ Used as a model during on campus training
2				**Detachable Slatted Floor House for Goats with Fishnet for poultry** ➢ Detachable slatted floor for goats with fishnet for poultry helps the resource poor farmer to integrate small ruminant and poultry rearing ➢ This model was provided to 5 farmers under NICRA scheme and has welcoming result. ➢ Used as a model during on campus training
3				**Movable Dipping Tank for Small Ruminants** ➢ The dipping tank is 9 feet length, 3 feet width and 3 feet height and weighs 80 kg and capacity is 800 litres of water. The tank is movable and hence can be wheeled to animal shed and thereby reducing labour and stress to animals. Up to 500 goats can be dipped one by one at a time. ➢ This model helps to reduce the cost of erection of conventional dipping tank to a considerable extent. ➢ Used as a model during on campus training
4	Livestock unit			**Wheel Barrow for Farm Waste Removal** ➢ Made of plastic mounted on a rectangular metal frame of 5.75 feet length and 2.65 feet width and 2.60 feet height with the capacity of 125 litres. This unit is movable through a pair of wheels (pneumatic tyres) fixed at the centre for mobility. ➢ The plastic container could be rotated to 1800 angle to unload the farm waste. ➢ This wheel barrow is convenient to load the farm waste, transport easily and quick unloading. This saves labour, prevents spillage and easy to clean.
5	Piggery unit			**Barrel type Automatic Drinker for Grower Pigs and Adult Pigs** ➢ Made up of thick plastic cylindrical drum with lid of 120 litres capacity fitted with mechanical nipple. ➢ The mechanical nipple is made up of stainless steel and let animal drink water by bitting action in order to eliminate water waste from play and accidental operation. ➢ For piglets the drum is fitted with 6 nipplers for grower the drum is fitted with 5 nipplers and fro finishers/adult the drum is fitted with 4 nipplers to provide equal space for individual piglets for accessing the nipplers for drinking water and to avoid fighting among pigs. Provided with plates at the bottom so that they can be fixed at any desired location. ➢ The nipple is also provided with screen filter to keep out unwanted debris. Reduces space required for providing water. ➢ Used as a model during on campus training
6				**Barrel type swill feeder for pigs** ➢ Made up of thick plastic cylindrical drum of 120 litres capacity ➢ Provided with a loading inlet which can be rested at the

				level of side wall for easy feeding of animals from outside of the shed ➢ Provided with stand which can be fitted to the ground by screw Can be mounted at any desirable location ➢ The feeding inlet is guarded by metal frame to avoid damage of the plastic drum by pig biting ➢ Minimize contamination of swill feed with urine and faeces of pigs. Aids in hygienic maintenance of pig shed. ➢ Used as a model during on campus training
7				**Piglet Soothe Snooze Deck** ➢ The piglet soothe snooze deck is 3 feet length, 2 feet width and 2 feet height. It is fabricated using plywood on three sides and with acrylic door in the front. ➢ A lamp is mounted on the top to provide light and warmth to the piglets during night and winter. ➢ The floor is made up of two layers Viz. rubber mat on which the piglets rest and iron mesh beneath it to provide rigidity and to drain the excreta of the piglets. ➢ Designed to reduce the mortality in piglets due to hypothermia and crushing injury by the dam. Improves the daily body weight gain of the piglets as less amount of energy is lost for thermoregulation. Piglets can be kept for 3 week of age in this deck. ➢ Used as a model during on campus training
8	**Poultry Unit**			**Portable Mini Poultry Brooder** ➢ It is portable brooder guard is made of up of polypropylene flute board sheets which can withstand the brooding temperature. ➢ The brooder guard height is 1ft and 3 ft diameter. It can accommodate 100 chicks. ➢ It consists of a heat source (incandescent bulb) with height adjustment to increase / decrease the temperature based on the behaviour of the chicks. ➢ It is washable and can be disinfected and reused. ➢ Used as a model during on campus training
9				**Portable Egg Candler** ➢ Portable egg candler is an oval shaped and handy device made up of wood with dimension of 14 cm length, 9.5 cm breath and 1.8 cm height. ➢ A rotating device is fixed on the oval platform, where the eggs can be kept and viewed for embryonic growth. ➢ Used as a model during on campus training
10				**Poultry Waterer with Heater** ➢ Poultry waterer with heater is made up of HDPE and 2.5 liter capacity. ➢ No need to add water sanitizer. It is portable and washable. ➢ Used as a model during on campus training
11	Fodder Development	April 2017	Private Firm Velanputhumai	**Rain Gun** ➢ It consists of four rain gun attached to pipeline ➢ The height of the rain gun can be adjusted according to the height of the crop. ➢ Useful especially for backyard fodder cultivation ➢ Used as a model during on campus training

Establishment of Kadknath breeder unit

Background:

- Kadaknath breed is having high demand among poultry farmers
- Higher price in the market and organized farms producing Kadaknath is not present in Namakkal and nearby districts

Approach:

- KVK, Namakkal is establishing breeder stock of 40 birds and 10 cocks and after attaining considerable size of 100. The chicks will be sold to needy farmers

Popularization of improved native poultry strains

Background:

- As native chicken rearing farmers need suitable native chicken variety with high egg laying and higher weight gain
- Grama priya and Vanaraja are the strains with desired egg laying capacity and dual purpose respectively

Approach:

- KVK,Namakkal is one of the working partner with College of Poultry Production and Management, Hosur under Poultry Seed Project and distributed a total of 3927 Vanaraja and 2858 Gramapriya to Namakkal and Nearby district farmers in 2017-18
- Now poultry farmers in Namakkal with more than 500 gramapriya identified and documented for further propagation
- In addition the farmers can use own/ hired incubator to over the hatchability issues of these two strains

15. C. Give details of indigenous technology practiced by the farmers in the KVK operational area which can be considered for technology development

S. No.	Crop / Enterprise	ITK Practiced	Purpose of ITK
1	Poultry Th.Saravanan, S/o. Palanivel 5/31,Gandhipuram, Sendhamangalam, Namakkal	Low cost Incubator device Herbal Deworming	Better Hatchability of Eggs

16. IMPACT

16.A. Impact of KVK activities

Name of specific technology/skill transferred	No. of participants	% of adoption	Change in income (Rs.)	
			Before (Rs./Unit)	After (Rs./Unit)
Short duration & YMV resistant pulses varieties (Green gram – CO8 & Black gram – VBN 8)	1650	44	32844/ha	47788/ha
Drought tolerant Groundnut varieties CO6,CO.7,TMV13	760	38	60192/ha	77132/ha
Fodder cultivation & seed production	225	24	65000/ha	136000/ha
Hybrid Tomato cultivation	173	22	28,000/0.4 ha	45,000/0.4 ha
Seed propagated small onion/Aggregatum onion var.Co(On)5	264	30	60,000/0.4 ha	82,000/0.4 ha
Jasmine	87	5	43,000/0.4 ha	70,000/0.4 ha
Skill Course organised				
Small Poultry farmer	20	95	6000	20,000
Piggery Farmer	20	60	5000	12,000
Technologies				
Aseel cross chicks	120	75	9000	12000
Improved Poultry strains	120	80	9000	14,000
Large White Yark shire and Duroc pigs	40	50	12000	14000
Tellicherry cross goats		60	8000	10,000
Mineral Mixture	1598	95	10,000	10,500
Mineral Block	1230	70	6000	6300
Oral pellet vaccine and Lasota vaccine	120	35	5000	6000

16.B. Cases of large scale adoption

1. Impact on Introduction of New Green Gram Variety (Co-8) in Namakkal District (A Boon for Dry Land Farmers)

Preamble

Pulses are an important commodity group of crops that provide high quality protein complementing cereal proteins for pre-dominantly substantial vegetarian population of the country. Although, being the largest pulse crop cultivating country in the World, pulses share to total food grain is production is only 6-7% in the country. The

cultivation of pulses build up a mechanism to fix atmospheric nitrogen in their root nodules and thus meet their nitrogen requirements to a great extent.

In India, pulses can be produced with a minimum use of resources and hence, it becomes less costly even than animal protein. In comparison to other vegetables, pulses are rich in protein which are less expensive and can be cultivated as an inter-crop and also as mixed crop. Pulses are mostly cultivated under rainfed conditions and do not require intensive irrigation facility and this is the reason why pulses are grown in areas left after satisfying the demand for cereals/cash crops. Even in such conditions, pulses give better returns. Apart from this, pulses possess several other qualities such as they are rich in protein, improve soil fertility and physical structure, fit in mixed/inter-cropping system, crop rotations and dry farming and provide green pods for vegetable and nutritious fodder for cattle as well.

The potential of pulses to help address future global food security, nutrition and environmental sustainability needs has been acknowledged through the UN declaration of the 2016 International Year of Pulses. Pulses are a Smart Food as these are critical for food basket, important source of plant protein and help address obesity, diabetes etc. In addition pulses are highly water efficient, can grow in drought prone areas and help improve soil fertility by fixing soil nitrogen.

The total area covered under green gram in India was 30.41 lakh hectares with a total production of 14.24 lakh tonnes. The coverage of area and its production was maximum in Rajasthan, Maharashtra, Andhra Pradesh, Punjab, Tamil Nadu and Jharkhand. The National yield average was 468 kg/ha. With regards to Tamil Nadu, area, production and productivity are 229561 ha, 180726 tonnes and 787 kg/ha, respectively (2015-16).

Namakkal district comprises of four taluks viz., Namakkal, Rasipuram, Tiruchengode and Paramathi velur. The cultivation of green gram in kharif and rabi season is the special feature in Namakkal, Rasipuram and Tiruchengode taluks. These soil is usually medium fertile. Instead of leaving the fields fallow during the kharif season, farmers utilize south west monsoon to grow green gram. Among the kharif crops green gram, reigning poor man's crop over the centuries and has potential to sustain food and nutritional security of the small and marginal farmers because of its short duration, faster growth and high nutritive values. But the yield levels are much lower (285 kg/ha) when compared to other potential district. The participatory rural appraisal study in the district revealed that the non availability of released variety suited to both season, farmers were cultivating the local variety of green gram which is low yielding, susceptible to Yellow Mosaic Virus (YMV) and other diseases and grown purely on rainfed situation.

For control of pests and diseases farmers were using pesticides indiscriminately which has led to increased cost of cultivation. The local variety has lesser plant height, canopy spread and lower biomass production leads to lower yield. The local variety being long duration of 75-90 days made impossible to cultivate in deficit of rainfall in both the seasons. These factors cause the poor yield thus reducing income of farmers, Keeping in these view, to identify the suitable high yielding, short duration and resistant green gram variety for both kharif and rabi season, KVK Namakkal conducted on farm trial (OFT) experiments and found new green gram variety (CO-8) having high yield potential (1310 kg/ha) with resistant to yellow Mosaic Virus (YMV) and others pests. By looking into its performance, Krishi Vigyan Kendra, Namakkal adopted this variety for commercial cultivation in the farmer's field for getting higher production during 2014-15 onwards.

Intervention Process

The ICAR-Krishi Vigyan Kendra, Namakkal, conducted cluster front line demonstration (CFLD) under National Food Security Mission in Namakkal district to popularize new green gram variety (CO-8) during kharif and rabi season of 2015-16 and 2016-17.

Green gram – CO 8 ***(A Boon variety for dry land farmers)***

New Green gram variety (CO-8) is ideal for rainfed condition, short duration (55-60 days), determinate plant type with ***synchronized maturity, suitable for single & mechanical harvest which is amenable for single harvest saving labour and time***. Resistant to yellow mosaic disease, stem necrosis and moderately resistant to root rot, aphids and stem fly, Suitable for intercropping in maize and in redgram, it escapes terminal drought and ensures sustainable yield. This variety was released by Tamil Nadu Agricultural University, Coimbatore during 2013.

Intervention Technology

To popularize new green gram variety (CO-8) developed by Tamil Nadu Agricultural University, Coimbatore during 2013, Cluster front line demonstrations (CFLD) were conducted in area of 20 hectares of 50 selected farmer's fields. Namakkal, Tiruchengode and Rasipuram taluks of Namakkal district were selected for the demonstrations because of availability of larger pulses production area under rainfed condition. These taluks comes under north western zone particularly dry tract and it is characterized under low rainfall area with average up to 716 mm. The demonstrations aimed to attain the food and nutritional security through three-fold technological interventions such as introduction of high yielding variety, transfer of improved production package (seed treatment with bio agents viz., rhizobium, pseudomonas, foliar spray of pulse wonder at flowering and pod initiation stage) and use of integrated pest and disease management practices. These demonstrations were carried out in different villages viz., Sundangipalayam,

Kalyani, Karaikuruchi pudhur. Based on the soil test report, fertilizers were applied. The critical inputs like seeds, bio agents for seed treatment, pulse wonder and need based pesticides were provided to the farmers. The new green gram variety (CO-8) along with local check variety (Vamban 2 & 3) was demonstrated in an area of 0.4 ha for comparison in 50 farmers fields. KVK Namakkal conducted on and off campus training programmes on improved green gram production technology such as seed treatment with bioagents like rhizobium, trichoderma, PSB and pulse wonder spray at flowering and pod initiation stage. KVK Agronomist facilitated in performing the field operations like seed treatment, sowing, manuring, weeding, spraying, harvesting and post harvest handling activities. During the crop production pre-season meetings, regular field visits, training programmes, group discussions, farmer-scientist interaction and field days were conducted to enlighten the farmers about the benefits of the demonstrated technology. The yield was recorded and economics was worked out based on the current market price of inputs and produce.

Impact-Economic Gains

The new green gram variety (CO-8) variety, being resistant to yellow mosaic virus, stem necrosis and moderately resistant to root rot, aphids and stem fly and escapes terminal drought led to higher grain yield (813.5 kg/ha), lower cost of cultivation (Rs 16459/ha) resulting to higher net returns (Rs 28283/ha) as compared to local varieties. On the contrary the local variety of green gram i.e Vamban 2, Vamban 3 was susceptible to yellow Mosaic Virus (YMV), root rot and other sucking pests and for control of these pests and diseases farmers used more pesticides which has led to increased cost of cultivation (Rs.18120/ha). This was possible because of the intensive capacity building programmes and various extension activities by KVK scientists.

Impact-Horizontal Spread

The new green gram variety (CO-8) being a short duration variety, helped the farmers to cultivate even in kharif and rabi season and which in turn helped in improving the economy of the farming community. Also being resistant to yellow Mosaic Virus and crinkling disease led to less cost of cultivation compared to local variety. The positive attribute of green gram (CO-8) variety helped to the dissemination of technology in and around the villages of Namakkal, Tiruchengode and Rasipuram taluks. Out of 50 farmers involved in cluster FLD programme during 2015-16, 45 of them have sown this variety during 2016-17 kharif and rabi season in an area of 60 hectares. Further, Tamil Nadu Department of Agriculture, undertaken the up-scaling of this technology in larger areas during Kharif season of 2016-17. Similarly under NFSM, KVK, Namakkal also undertaken on 30 hectares area with 75 farmers during both kharif and Rabi season of 2016-17. By popularizing these technologies additional area is being achieved under pulses cultivation in Namakkal district.

Table 1: Share of Green gram (CO-8) variety to the total area and productivity of green gram in Namakkal district

Year	Area under Green gram (ha)	Area of Green gram variety CO-8 (ha)	Productivity of green gram before intervention (kg/ha)	Productivity of green gram After intervention (kg/ha)
2013-14	5902	Nil	552	Nil
2014-15	7058	564.6	552	610
2015-16	9037	1355.5	552	749
2016-17	6995	1538.9	552	792
2017-18	6581	1855.4	552	813

Conclusion

The adoption of new green gram variety (CO-8) through intervention of Krishi Vigyan Kendra, Namakkal in cluster approach enhanced the productivity leading to sustainable income annually. This has not only resulted in socio-economic security but also helped in attaining food and nutrition security of the community. Being a short duration variety, farmers could go for double seasons which added additional income for the farming community besides enhancing soil fertility. The awareness about improved technological practices, such as use of improved variety with resistant to pest and diseases, timely sowing, regular weeding, timely harvesting, post harvest handling could go a long way in bridging yield gap and also enhancing income of farmers.

2. Seed propagated Small Onion /Aggregatum Onion variety Co (On) 5

Preamble

Small onion / Aggregatum onion, *Allium cepa var.aggregatum* L is one of the most important commercial vegetable in India. The area under small onion is being increased in India especially in Tamil Nadu. India exports small onion to North Africa, West Asia, Sri Lanka, Malaysia and Singapore. Onion is one of the potential foreign exchange earners and is one among the vegetables, where India figures prominently in the worlds export market. India stands first in production, sharing eight per cent of the world production.

It is widely grown in different parts of the country mainly by small and marginal farmers. It is used as salad or cooked in various ways in all curries, fried, boiled or baked. It is also used in processed forms e.g. flakes, powder paste, pickles etc. It has very good medicinal value. Nutritive value of onion varies from variety to variety. Small sized onion is more nutritive than big ones. Its major value is in its flavour. The perpetual demand of onion within the country and for the export has made it essential to supply onions round the year either from fresh harvest or from stocks.

The total area under onion in Tamil Nadu is 4.01 lakh hectares with a production of 47.27 lakh tonnes. In Tamil Nadu it is widely cultivated in Dindigul, Tiruppur, Coimbatore, Perambalur, Namakkal, Cuddalore, Theni, Madurai, Tiruvannamalai and Dharmapuri districts. Tamil Nadu accounts for five percent of country's area under onion and more than 70 per cent of the area is cultivated by small onion. Around 90 per cent of country's small onion is produced from Tamil Nadu and 10 per cent from Karnataka. Both Kerala and Tamil Nadu together consumption and exports accounts the total small onion produced in Tamil Nadu.

The total area and productivity of small onion under Namakkal district was 1,997 ha and 12 t / ha, respectively. In Namakkal Ditrict, small onion is cultivated in two main seasons *viz.,* Early kharif (May –August) and Rabi (November – December). The existing practice has led to use of high seed rate (Totally 12.5 – 15.0 q of seed bulb is required for small onion cultivation in an area of 1 hectare), high cost involved for seed purpose (Rs. 31,250 – 37,500 / ha) and also timely sowing during rainy season due to deficit rainfall. CO 4 and Valayapatti local is the predominant variety cultivated in Namakkal District. These varieties propagated by means of bulbs.

Delay in sowing of small onion bulbs affects productivity in terms of delayed sprouting, slow growth of vegetative phase and reduction in yield. To mitigate these problems, farmers' preferred seedling variety which withstand drought during bulbing stage, ready availability of seedlings for transplanting at the time of rainy period to establish quickly with minimum rains is overwhelming and often wait for transplanting in rainfed areas till end of December in anticipation of rains.

Krishi Vigyan Kendra, Namakkal has introduced seed propagated small onion variety Co (On) 5 in Namakkal District during 2006. CO (On) 5 was developed by Tamil Nadu Agricultural University (TNAU), Coimbatore. It is a high yielding variety developed by mass pedigree method of selection. This variety has the ability of free flowering and seed set throughout Tamil Nadu. It possesses high bulb yield 18.9 t/ha (18.8 per cent higher than CO 4) in a crop duration of 90 days. It is free flowering type with seed setting ability of 250-300 kg/ha and so it is propagated through seeds. The seed rate required is 2.5 kg / ha.

Co (On)5 – variety propagated through seeds

Co (On)5 is a high yielding aggregatum onion variety, with attractive pink and bold bulbs. It has an average yield potential of 18.9 tonnes of bulbs per hectare, which is 18.8 per cent higher than that of CO 4. Each clump of this variety produces three to five bulbs, which will weigh about 60 g. The bulbs have good flavour and taste. The variety is moderately susceptible to purple blotch disease, and it is a ready victim for thrips attack. The pungency principal measured as pyruvic acid is 2.37 µm/g of fresh weight. Any seed- setting onion variety, is preferred by the farmers over the bulb-propagated ones, as it would ensure a saving of up to Rs 31,250 – 37,500 per hectare in the cost of seed bulb alone. Because of its high productivity and excellent bulb quality it is adored by the farmers, traders and consumers alike. The area under Small onion cultivation increased from 1500 ha during 2006 to 1950 ha during 2017, in which the Co(On) 5 is cultivated in 30% of the total area. The seedlings were produced by raised nursery bed and its possessed good seedling characters (Table 1)

Table 1: Observation on Seedling characters of small onion var.Co(On)5

Sl.No	Observation recorded	40 days old seedling
1.	Seedling height	15.2 -18.3 cm
2.	Leaf sheath diameter	0.7-1.1 cm
3.	Number of leaf sheath	2-3
4.	Onion bulb length in the seedling	1.0-1.3 cm
5.	Number of roots	13-21
6.	Root length	1.7-2.1 cm

Yield and quality parameters

CO (On) 5 was harvested in 90 days after transplanting. The equatorial diameter of compound bulb and bulblets (4.7 and 3.6 cm), polar diameter of compound bulb and bulblets (4.47 and 4.01 cm) was found maximum in CO (On) 5 compared to CO 4 and Valayapatti local (Table 2). In case of number of bulblets per compound bulb, CO (On) 5 registered the highest (3-4) followed by CO 4. The maximum yield per plant (43 – 82 g) was recorded in the variety CO (On) 5.The variety Co (on)5 registered the highest yield (20.5t/ ha) and showed an increase of 18 % over CO4.

Table 2. Yield parameters of Aggregatum Onion

Sl.No	Observation recorded	CO (On) 5	CO 4	Valayapatti local
1.	Equatorial diameter of compound bulb (cm)	4.7	4.5	3.9
2.	Polar diameter of compound bulb (cm)	4.47	4.02	4.00
3.	Equatorial diameter of bulblet (cm)	3.6	3.4	2.7
4.	Polar diameter of bulblet (cm)	4.01	3.23	3.18
5.	Number of bulblets per compound bulb	3- 4	2 -3	2-3
6.	Weight of the compound bulb (g)	14.3 - 27	6 - 8.02	5.8
7.	No.of compound bulbs/Kg	23 -25	40-46	69 -71
8.	No.of bulblets/kg	82	89-96	152
9.	Yield/ plant (g)	43 - 82	19-24	16 - 19
10.	Yield/ ha (t)	20.5	16.8	12.0

Thickness of neck is one of the important character which indicates vigour of the plant. Small onion cv.Co(On) 5 registered maximum neck thickness and also possessed good dry skin colour and fleshy scale colour compared to other varieties (Table 3). The storage period of Co(On) 5 under low cost bottom ventilated storage structure was two months only with sustained quality parameters because it contains high moisture in the bulb. Hence it is recommended for immediate sale at one month after harvesting.

Table 3. Quality parameters of *Aggregatum* onion.

Sr. No.	Parameter	Characteristic		
		CO (On) 5	CO 4	Valayapatti local
1.	Thickness of neck (cm)	1.2 -1.5	0.9- 1	0.8-1.0
2.	Basic colour of dry skin	Dark red	Pink	Dark pink
3.	Adherence of skin after harvest	Medium	Medium	Strong
4.	Colour of epidermis of fleshy scale	Whitish pink	Whitish pink	Whitish pink
5.	Position of root disc	Exerted	Inserted	Exerted

The economic analysis revealed that the highest expenditure per ha (Rs.1,07,976 /-) was incurred in cultivating onion var.CO4 as compared to Co (On) 5 (Rs.87,306 /-) and the maximum net return (Rs.3,17,694/-) was obtained from the variety Co (On) 5. The highest cost of cultivation was due to highest seed rate and high price of seed bulb. Therefore, farmers can save an amount of Rs.31,250/- besides getting additional profit of Rs.2,86,444/- while growing CO(On) 5 with low seed rate. The Cost: Benefit ratio also highest (1:4.6) in case of CO(On)5.

Conclusion

The aggregatum onion cultivation with low seed rate (2.5kg/ha) variety Co(On) 5 proved economically viable intervention for the farmers. These farmers' benefitted with an additional yield of 1.8 to 2 tonnes / ha (25 % increase in yield) compared to farmers who directly sown bulbs during December. Any seed - setting onion variety, is preferred by the farmers over the bulb-propagated ones, as it would ensure a saving of up to Rs 31,250 – 37,500 per hectare in the cost of seed bulb alone. Besides, raising the income level the intervention provides livelihood security to onion growers of the area. Considering the productivity and profitability the farmers expressed satisfaction with the performance of onion var.CO (On)5 because it got better market preference due to its size and appealing attractive dark pink colour. The farmers of adjoining districts are also convinced and started to onion cultivation with CO (On) 5 variety.

3.Promotion of els cotton through institutional approach in namakkal district

Introduction

Namakkal district, location in the central part of Tamil Nadu State is well known for its cotton cultivation since 2011. During that time the area under cotton was around 3020ha and the same had reduced to 1409 ha during 2013 due to severe incidence of pink boll worm and white fly due to indiscriminate use of synthetic pyrethroids that might have built resistance and resurgence in pests. The cotton farming society of Namakkal had no other option but to take the decision of changing their cropping pattern by switching over to maize, ground nut and hence the area under cotton in namakkal had drastically reduced. During 2014, KVK namakkal played a pivotal role in addressing the pest's problem in cotton through strategic approaches which paved way for regained prospects of cotton crop and the area under cotton gradually increased to 2560 ha in 2017-18 with an average productivity of 18 to 20 q / ha.

Problem scenario

KVK namakkal took proactive role by making field level study to understand the ground realities of cotton production in the district. Series of field visits, interaction meetings with farmers, studies involving

Participatory Rural Appraisal (PRA) techniques were done to gain insight on the problems and the opportunities for initiating development interventions. The series of efforts taken by the KVK team found out the following problems associated with cotton production at field conditions.

- Maintenance of poor plant population
- Severe incidence of pest especially the boll worms attack during critical crop growth phases.
- Nutritional disorders in plants due to the low fertility status of soil that could not support for better crop stand.
- Lack of knowledge on nutrient deficient and their management
- Lack of awareness among cotton farming community about alternative options like ELS *Bt* technology to address boll worm problems.
- Non availability of quality seeds or better pest resistance varieties.
- Lack of knowledge on strategizing effective pest control measures by farmers
- Poor weed management
- Indiscriminate use of inorganic fertilizers
- Lack of knowledge on biological control of pest and disease
- Indiscriminate use of insecticides
- High labour scarcity
- Lack of awareness on market

Varieties used in namakkal district

Before intervention of kvk

Many farmers were growing cotton year after year and they used cotton variety seeds too, but realized only marginal amount of additional yield and income. The return was non remunerative due to poor yield (8q/ha), low market price and higher cost of pesticides. Such situation resulted in change of their decision not to go for cotton cultivation due to its low return and higher expenditure. Pesticides occupied more share of expenditure and the same became reason for disintegration of farm. The average cost of cultivation was Rs. 24000 / ha. But the net income they realized was only Rs. 5000 / ha. Finally they decided to shift to maize and groundnut crop. During that period the following varieties of cotton viz., surbhi, MCU 5, MCU 11, LRA 5166, 11,Suvin, Jayalakshmi, SVPR1,2,Paiyur 1, Savitha, KC2 were widely cultivated by the farmers.

Cotton scenario of the Namakkal District during the cropping period

- Area under Cotton cultivation in Namakkal district : 2560 ha
- Name of Zone : North Western zone
- Farming situation in the district : Rainfed & irrigated
- Rainfall for Namakkal district : 911 mm
- Maximum Temperature : 34.71º C
- Minimum Temperature : 20.21 º C
- Relative Humidity : 76.8 %
- No. of Rainy days : 21 days
- Production : 18-20 q / ha

Table 1: Area and productivity of cotton in namakkal district

Before introduction of ELS Bt cotton			
S. No	**Year**	**Area coverage (ha)**	**Productivity (Q/ha)**
1	2011-12	3020	12
2	2012-13	2551	11
3	2013-14	1611	10

Table 1 indicated a reduction in trend of cotton area and productivity levels in namakkal district. Field visits and constant interactions with the farmers confirmed that the area came down drastically every year due heavy incidence of pests like boll worm resulting in drastic reduction in productivity levels and the expenditure incurred for plant protection significantly increased and hence cotton growing farmers decided to adopt for alternative cropping pattern.

Intervention by KVK namakkal

KVK namakkal carefully analyzed the situation and assessed the options available for immediate interventions. Accordingly, it was decided to adopt ELS *Bt* cotton as technological option to address the major problem of boll worms infestation. It took its first level of effort in building awareness among cotton farmers about the menace of boll worm infestation and its management. Along with that a package of practices like seed

treatment, soil test based fertilizer application, sucking pest management, nutrient management, growth hormone application and other agronomic practices were also emphasized to adopt so as to ensure integrated effort in addressing cotton production related problems simultaneously. Field days and media focus were given more intensively to ensure ELS *Bt* cotton technology to spread across cotton farmers through their society.

Change in farmer's decision in varietal use

After the entry of ELS Bt

The series of efforts taken through training, demonstrations, awareness program, building awareness vide mass media by KVK namakkal supported the farmers to decide upon alternate varieties to tackle the boll worm problems. They started using ELS Bt cotton on trial basis to test verify its performance and later entered into full adoption. Farmers of the district started adopting the following varieties. MRC6918 BG-II, Bahubali (MRC 7918 BG II), Rasi BUMBAC BG II. Among the Bt hybrids MRC 7918 BG II occupied more area in Namakkal district.

KVK intervention :

- Popularization of Bahubali (MRC 7918 BG II), Rasi BUMBAC BG II. hybrid @ 1.125 kg / ha
- Seed treatment with *Azospirillum* and *Phosphobacteria* @ 3 pkts each and soil application of *Azospirillum* and *Phosphobacteria* @ 10 pkts each /ha
- *Pseudomonas* and *T.viride* @ 2.5 kg each is mixed with 25 kg FYM and applied to the soil
- Foliar spraying of cotton plus 2.5 kg in 200 liters of water
- Soil test based fertilizer application
- Maintaining optimum plant population
- Line sowing with a spacing of 120X90cm for Bt cotton cultivation
- Weeding by using one pre emergence herbicide followed by one mechanical weeding on 30-40 DAS.
- Application of micronutrient mixture @ 12.5 kg / ha as basal.
- Foliar application of micronutrients *viz*., $MgSO_4$ (0.5%), Urea (0.1%) and $ZnSO_4$ (0.5%) on 50 and 80 DAS
- Nipping the tip at 18-22th nodes (110 DAS)
- Spraying of growth hormone NAA 40 ppm (Planofix @ 4.5 ml in 10 lit of water) at 40 and 70 DAS
- Foliar application of KNO_3 2 % at 50 and 80 DAS
- Spraying of NSKE 5% (25 kg of NSKE + 500 gm of khadi soap) or Imidacloprid 70 ws @ 7.5 ml / 10 lit of water during pest incidence
- Setting up of yellow sticky trap @ 12 nos. / ha.
- Release of papaya mealy bug parasitoids *Anagyrus locki, Pseudoleptimestrix, maxicana Acerophagus papayae* @ 100 nos each
- Foliar spray of Profenophos @ 2 ml / lit of water @2 times during cotton mealy bug incidence above ETL

Table 2: Area and productivity of cotton in namakkal district

After introduction of ELS Bt cotton			
S. No	**Year**	**Area coverage (ha)**	**Productivity (Q/ha)**
1	2014-15	2129	18
2	2015-16	2155	22
3	2016-17	2356	15
4	2017-18	2560	19

It is quite evident from above that the area under cotton, exhibited an increasing trend due to introduction of ELS *Bt c*otton. The ELS *Bt* technology worked well as these varieties did not attract boll worms, pesticide spray reduced, the yield and net return increased and the same motivated farmers to continue the use of ELS Bt cotton in their farm which led them to lead healthy life.

The following details reflect on various efforts taken by the KVK in resuming cotton cultivation in namakkal district.

Table 3: Year-wise Training programme organized by KVK namakkal (2014-2017)

			No of	**Total no of**
1	2014-15	(a) Training (b). Radio announcement (c). Demonstration	2 2 4	60 Mass 114

2	2015-16	(a.) Training (b). Radio announcement (c). Demonstration (d).Field Day	7 4 4 1	167 Mass 98 55
3	2016-17	(a.) Training (b). Radio announcement (c). Demonstration (d).Field Day (e).Newspaper coverage (f).Group meeting (g).Diagnostic visit (h).Advisory service (i).Field visit (j).T.V.programmes (k).Film show (l)Popular activities (m)Publication	10 5 6 1 5 6 6 12 5 2 2 1 1	219 Mass 57 125 128 58 88 21 55 Mass Mass Mass Mass
4	2017-18	(a.) Training (b). Radio announcement (c). Demonstration (d).Field Day (e).Newspaper coverage (f).Group meeting (g).Diagnostic visit (h).Advisory service (i).Field visit (j).T.V.programmes (k).Film show (l)Popular activities (m)Publication	5 2 6 1 1 4 5 12 5 1 1 1 1	202 Mass 75 150 mass 62 25 60 50 Mass Mass Mass Mass

During the early phase of ELS Bt cotton entry, people were reluctant to accept the innovation and adopt the same in their field. The scientists from the KVK created the awareness about ELS Bt hybrids. The continuous efforts taken by the KVK paved way for changing the mind sets of farmers and they got convinced about the technology. Now they are getting an average seed cotton yield of 18- 22 q / ha and realize better net return /ha due to lesser expenditure for the pesticides.

Success story

Mr. Ravikumar s/o Palanivel is a marginal farmer living in thoppa patti village use to cultivate cotton in his farm years together which was his main livelihood crop. But, of late he could not realize sufficient income through cotton cultivation, the mainly due to intensive boll worms attack. He tried many ways but could overcome the situation and left cotton cultivation without any option. But his income earning opportunity became remote and the income earning status became very low. He had a very important responsibility of sending his son for B.E studies. He left with no other option but to sell his 2 acres of rainfed land to tide over the situation and met out his son's educational expenditure. Of late, he was selected as one of the FLD farmers under KVK plan and had participated in various training activities on ELS Bt cotton conducted by KVK. The ELS Bt technology became a perfect solution for his problems and used it to circumvent his recession period. He started cultivating E L S Bt cotton in his lands and reaped bumper yield of 18 to 20 q/ha realizing good net return. Of late, this helped him to support his son's higher study of M.E, his agriculture scenario changed with purchase of more farm support systems like Tractor, Rotovator etc. ELS Bt cotton cultivation has helped him to recover from dwindling living status towards income stabilization and prosperous livelihood condition.

Impact

- During the awareness stage, demonstration, on farm testing, etc were done and laid down the trials on ELS Bt cotton to involve farmers to experience its reliability and performance. There were also series of interactive sessions held to bring the farmers to the stage of conviction and thereon to adopt the Bt technology. Slowly farmers started adopting such ELS Bt variety in small scale during trial stage seeing the relative advantage in terms of pest attack and the incurred expenditure. Due to the introduction of ELS Bt the area under Bt cotton in namakkal ha district has increased to 2560 ha which would also increase further in future.
- Then the message from fellow farmers spread to their peer groups on its own and through KVK's field day efforts as well. Now-a-days cotton farmers become so proficient in deciding upon specific hybrids among

ELS Bt innovation based on their performance. The reduction in pesticide spray not only reduced their expenditure but also its load to the environment and deleterious effects on human being. In addition net income from ELS Bt cotton hybrids has increased which enabled the farmers to purchase new farm implements, land and animals also. The cost of cultivation is reduced to 25%, number of pesticide spray and quantity of chemical also declined, nutrient deficiencies have been overcome and the yield is increased to 40-61%. The income increase realized was Rs.40000 – 50000 / ha

Achievements under cotton production technology rain fed conditions

S.NO.	Varieties		No .of demo	Area (ha)	Average seed cotton yield(q/ha)		% increase in Yield	Cost of Cultivation/ha (Rs)			
Year	Demo	Check (non) Bt)			Demo	Check		Demo	Local check	Demo	Local
2014-15	MRC6918 BG-II	MRC6918 BG-II	25	10	18.50	16.00	15.62	35000	40000	2:10	1.50
2015-16	RCHB-708 BG-II	RCHB-708 BG-II	50	20	22.00	17.00	29.41	42000	42500	2.50	1.80
2016-17	MRC6918 BG-II	RCH708 BG-II	10	10	17.10	15.5	10.32	46400	54629	1.91	1.22
2017-18	MRC7918 BG-II	MRC6918 BG-II	324	1000	19.5	17.00	14.70	60698	51713	1.75	1.30

Pesticide reduction status of namakkal district

Year	No. of sprays	Volume (ml/tank)	No. of tanks / acre
2011-12	2	20	10
2012-13	2-3	20	10
2013-14	2-3	20	11
2014-15	3-4	20-25	12
2015-16	3-4	20-25	12
2016-17	2	20	10
2017-18	2-3	20	10

The cotton cultivation area is increased when compared to the previous year. Due to pest incidence specifically the pink boll worm and whitefly and also farmers sprayed more no. of sprays, uses of indiscriminate pesticides, resulted in higher side of cultivation expenditure. On introduction of ELS Bt slowly the area under cotton increased as the Bt hybrid stood as proven solution to address bollworm complex which evoked good response among cotton farming community. Now the cotton area reported to be as 2560ha. And the return from the cotton cultivation using Bt is remunerative.

Summary

Cotton cultivation was widely adopted in namakal district during 1999 -2000. But the same had significantly reduced due to heavy incidence of boll worms reducing the productivity and profitability. Efforts were taken by KVK namakkal for introduction promotion of E L S Bt cotton through strategic research and extension measures adopting the principles of Technology Assessment and Refinement and the same had led to increase in area under cotton in the district and the economic prospects of cotton farmers had increased significantly in namakkal district in Tamil Nadu.

4.Semi Intensive desi chicken rearing by small holder farmers in Namakkal district

Preamble

Introduction

Village poultry can be found in all developing countries and play a vital role in many poor rural households (Alders, 2004). The organized poultry sector in India is contributing nearly 70% of the total output and the rest 30% by the unorganized sector. Within poultry sector, Two-thirds (about 66.7%) of the output is contributed by poultry meat sector and rest One-thirds (about 33.3%) is from egg production (Prabhakaran, 2012). Rural household poultry

production contributes 70% of total production in most low-income, food-deficit countries (Branckaert et al., 2000). Approximately 20% of the protein consumed in developing countries comes from poultry meat and eggs.

The native chicken varieties adopted in free-range backyard conditions for centuries contribute about 11% of total egg production in India. (Kumaresan et al., 2008). Native chicken meat represented increases of about 13% at markets and 27% at supermarkets in comparison with prices of meat from commercial chickens in african countries (Gueye, 1998a).This holds good for India too. This ideal situation propelled the desi bird rearer to become desi bird entrepreneur with commercialization in their farming. But it is a small market segment within the meat market.

As already Namakkal district is popular for poultry egg and meat production, layer and broiler farming was becoming industry and this scenario leave resource poor farmer. So the livelihoods of these resource poor are major concern. In order to achieve inclusive growth, it is essential to focus on enhancing efficient use of resources, conserving natural resources, increasing productivity, profitability and improving quality and competitiveness through reduced unit cost of production mainly in desi chicken rearing.

Efforts of Krishi Vigyan Kendra, Namakkal in sustainable desi poultry farming

Krishi Vigyan Kendra, Namakkal from its inception, had conducted several on and off campus training, skill training, On Farm Trails, Front Line Demonstrations on performance of improved strains, housing, vaccination, hatching eggs in small scale incubators and feeding pattern of desi birds. The results of OFTs and FLDs were popularized among the backyard poultry farmers of Namakkal. The needed inputs such as desi / improved chicks and vaccines were sold through KVK, Namakkal. All these efforts were transformed desi chicken rearing from subsistence to commercial.

Current Scenario of semi intensive desi poultry farms in Namakkal district

In Namakkal district, semi intensive desi bird venture is now becoming popular and at present more than 90 farms with the flock size of 100 birds and 10 farms with more than 500 birds and 3 farms with more than 3000 birds are present. In this venture, most of the farmers were youth with collegiate education. In Semi intensive desi bird farming, the farmers reared non-descriptive chicken along with improved strains such as Namakkal Chicken-1, Gramapriya and Vanaraja. In commercial farming most of the farmers obtained chicks from their parent flock and most of them reared chicken for meat purpose

Production performance of birds in native and improved poultry birds

S. No	Performance indicators	Aseel cross	Gramapriya	Vanaraja
1	Weight at 8 weeks (gms)	340-500	400-500	650-750
2	Weight at 12 weeks (gms)	500-800	800-950	750-800
3	Annual egg production (Nos)	52 -83eggs	200-230	100-110
4	Number of clutches per year	4-6	6	5-6
5	Hatchability of eggs	69-82 per cent	Needs incubator for hatching (90-95%)	

Mostly the farmers follow multiple batch system with the batch interval of 1 month. They regularly vaccinated the birds against the disease like Ranikhet, Infectious bursal disease and fowl pox with the help of commercial poultry agents/ own. They disinfected the house between two batches, marketed the birds at the age of 3 months and the body weight at marketing was 1.5 kg. They marketed the birds to the retailer at the rate of Rs.180 per kg live weight and utilized the manure for his own land. The average annual net income generated from poultry was Rs.2.5 lakh. They utilized the income for household, education of the children and purchasing of livestock.

Conclusion

The desi bird farming has the potential to attract educated youth and generate additional income to the rural households. This enterprise has the potential to act as a tool to move away from poverty. Further, can be promoted in rural pockets, adjoining to peri urban areas where ever growing niche market demand for desi bird chicken meat is noticed

16.C.Details of impact analysis of KVK activities carried out during the reporting period

Scenario of desi poultry farming in Namakkal district

Small holder poultry production (i.e. family poultry) is an appropriate system that makes the best use of locally available resources. Family flocks are important providers of eggs and meat as well as being valued in religious and cultural life. Poultry is one of the fastest growing segments of the agricultural sector in and around Namakkal district of Tamil Nadu. There are three production systems for family poultry - free range, backyard and small-scale intensive with productivity of 40 - 60, 50 - 100 and 80 - 150 eggs / hen / year, respectively. Under free ranging system, desi poultry hens start egg laying from sixth month onwards. Poultry, particularly in the free range, provide meat, eggs, feathers, manure (convertible to fertilizer and natural gas), pest control, weed clearance, seed cleaning of grasses for mulch, scratching and foraging (Sonaiya et al., 2013). Under free-range systems, desi poultry can easily pick up its food

in the backyards once it learns to scavenge in the household surrounding. Under free-range conditions the necessity of supplementary feed/ feed ingredients mostly depends on the free area available in the field, intensity of vegetation and availability of waste grains, insects, grass seeds etc. (Pathak and Nath, 2013). The unorganized desi birds rearing sector, which is with the people below poverty line, wants serious attention to come out from the poverty spiral. Sheldon (1998) stressed the need to readdress village poultry production with new ideas and technologies for people below poverty line to make it commercially attractive in future.

Efforts of Krishi Vigyan Kendra, Namakkal in sustainable desi poultry farming

Krishi Vigyan Kendra, Namakkal has conducted several Front Line Demonstrations on performance of improved strains, housing, vaccination, hatching eggs in small scale incubators and feeding pattern of desi birds since a decade. The FLDs on regular vaccination against Ranikhet with Lasota and TANUVAS oral pellet vaccines produced good results and found reduction in mortality due to diseases. Also supplementation of azolla found increase in weight gain. Providing night shelters assisted the birds to protect from theft and untoward climate. Whereas intensive housing and performance of improved strains didn't fetch positive results. Rearing improved strains didn't give decent market price to farmers due to lack of consumer preference. Small Scale incubators resulted in improvement of hatching eggs in large scale but frequent repair of spares made the farmers to invest more for making the machine in working condition.

Economics of semi intensive desi poultry farms in Namakkal district

A case study was conducted to assess the real profitability in desi chicken rearing at Namakkal district with three farmers rearing desi chicken in semi intensive system. Case study was conducted with native chicken farmers, Mr.Mathivanan of Sendamangalam, Mr. Eswaran, Puthuchatiram and Mr. Veerakumar of P. Mettupatti during April – September 2017. The input cost for birds, feed, vaccines and medicines were taken. Like the average return per bird was assessed from the price per kg of meat and price per egg. Fluctuations in different seasons were included. Reasons for mortality of chicks and birds were recorded. The marketing avenues to sell the birds and eggs were identified.

Results and Discussion

The average live body weight of 1 kg was attained at the age of 3-4 months when the birds reared under semi intensive system. The egg yield per bird was recorded as 59±11. The hatchability was 72%. Chick mortality was noticed mainly due to weaklings and predators. Ranikhet outbreak was controlled with regular vaccinations. Farmers fed vitamin supplements and azolla as alternate feed to gain more live weight. Mortality during winter season was more. Ranikhet outbreak was more in summer season. Pecking problem was noticed when the birds were not provided with adequate space for grazing. To avoid this farmers practice beak trimming at the age from 3 to 4wks. But the market value for these birds is low that ends economic loss for the native chicken farmers. Since Tamil Nadu is known for cock fight and people reared the particular breeds like *Aseel, kadaknath and Naked neck* birds with trimmed beak has low commercial value since people alleged that the birds were fed under intensive system and the taste is almost like broiler. Hence the practice of trimming of beak was stopped and the birds were allowed to open fenced fields to graze.

It is found that the rate / kg for Aseel cross chicken fluctuates between Rs.150-230/kg and the rate for Country chicken is between Rs.250-300/kg and Rs.8-15/desi eggs. Normally farmers feed the birds with concentrate for one month and reared in cages or deep litter houses. After that the birds reared in free range system with low cost nutrient diet normally grains, rice etc., The birds are vaccinated with Lasota vaccine on 7^{th}, 21^{st} and 60^{th} day. When the farmers reared the native chicken instead of improved strains in the above said system, it is found that the desi chicken farming is sustainable.

The economic analysis of the identified farms is given below.

Sl. No.	Address with Phone Number	Year of Experience	Monthly Income and B.C ratio	Flock size
1	Mr.K. Eswaran Puthuchatiram	10	Gross income: 1,00,000 Gross expenditure:35,000 B.C Ratio- 1:2.9	500
2	Mr.Mathivannan Senthamangalam	8	Gross income: 25,000 Gross expenditure:10,000 B.C Ratio -1:2.5	350
3	Mr. Veerakumar Vadavathur	7	Gross income: 45,000 Expenditure:15,000 B.C Ratio-1:3	1000

Conclusion

Though native chicken rearing yields more profit with less investment, farmers face problems in desi chicken rearing either due to diseases or marking. In order to overcome this problem, it may be necessary to take up specific rural poultry production programmes with low input technology to meet the requirements of the rural sector, where

poultry farming constitutes a source of subsidiary occupation, generating subsistence, income to boost the nutritional standards and health of rural masses. The rural family poultry (backyard poultry) units require very little hand feeding and provide handsome returns with minimum investment. Only thing the farmers have to be trained properly in health management and bio safety measures followed in desi poultry farming. A common market may be established at village level to sell desi eggs and meat. Thus, rural poultry farming not only increases income levels, employment opportunities to small farmers including women but also bring about desired socio-economic change in rural areas which are vital for rural development and rural prosperity.

17. LINKAGES

17.A.Functional linkage with different organizations

Name of organization	Nature of linkage
Tamil Nadu Agricultural University, Coimbatore	Technical guidance, Supply of seeds and planting materials, Exposure visit, Farmers day, plant growth booster & biofertilizers
Regional Agricultural Research Station, ANGRAU, Tirupati	Getting groundnut seeds for CFLD programmes
Regional fodder station, Alamathy, Chennai & Hessaraghatta, Bengaluru	Getting fodder seeds for OFT programme
Department of Agriculture, Namakkal	Preparation of ATMA technical action plan, conducting farmers Training at village level, joint field visit on farmers field oriented problems, conducting field days, act as resource persons for ATMA trainings and farm schools.
Tamilnadu Fisheries Department, Krishnagiri, Nagapattinam and Mettur	Purchase of GIFT Tilapia, Carps seeds seeds & Training Technologies relevant to Fish and shrimp
NFDB, Hyderabad	Sponsoring agency for training programmes
CIBA,Chennai	Technologies relevant to shrimp and cage culture and purchase of probiotics
IIHR,Bangalore	Purchase of microbial consortia, vegetable seed and planting materials of flower crops.
HC& RI,TNAU,Coimbatore & Periyakulam	Purchase of vegetable seed and planting materials of fruit crops.
CTCRI,Tiruvananthapuram	Technologies relevant to tuber crops and purchase of planting materials of tuber crops.
IISR,Calicut	Technologies relevant to spice crops and purchase of planting materials of spice crops
NRCB,Trichy	Technologies relevant to Banana
Department of Horticulture,Namakkal District	Technical review and participation in programmes
NABARD,Chennai	Sponsoring agency for CAT programmes and cage system of fish rearing
Pudhuvazhvu project	Sponsoring agency for training programmes
MYRADA KVK,Erode	Supply of horticultural crop boosters
State Department of Agriculture and Horticulture	Season specific training and demonstration on seed treatment with biofertilizers, setts treatment
Agri Business and Agric Clinic programmes	Trainings related to Establishment of Soil Testing Laboratory were taken
Tamil Nadu Veterinary and Animal Science University	Host orinisation,Technical guidance, Supply of Mineral mixture, Grama priya and Vana raja chicks, Namakkal chicken 1, Extension farm literatures both in print and CDs, Exposure visit, Appreciation to Livestock and IFS farmer & Funding for FLD,OFT in livestock and Village Adoption.
Translational Research Platform in Veterinary Biologicals(TRPVB),TANUVAS	Technical partner for purchase of Mastiguard
National Innovation Foundation, DST, New Delhi	Technical partner and Knowledge Sharing in the field of EVM
Tamil Nadu Livestock Development Agency	Financial partner for dairy farmer orientation Programme
Department of Animal Husbandry	Joint implementation in livelihood progrmmes
Agricultural Technology Management Agency	Partner in capacity building Programme
Tamil Nadu Co-operative Milk Producers' Federation Limited (Aavin)	Partner in dairy farmer knowledge management
Mahalir Thitam/ Puthu Vazhu Thittam	Training Partner in livelihood and Entrepreneurial development

17.B. List special programmes undertaken by the KVK and operational now, which have been financed by State Govt./Other Agencies

Name of the scheme	Date/ Month of initiation	Funding agency	Amount (Rs.)
NICRA Scheme	Since 2011 to till date	ICAR- CRIDA, Hyderabad	14,48,000.00
PPP Mode for Fodder seed production and supply	Since 2010 to till date	TANUVAS Self financing project	Self financing
PPP mode of horticultural planting material production and supply	Since 2011 to till date	TANUVAS Self financing project	Self financing
Cluster FLD on Pulses	June, 2017	NFSM through ICAR-ATARI, Hyderand	3,00,000.00
Cluster FLD on Oilseeds	June, 2017	NMOOP through ICAR-ATARI, Hyderand	5,10,000.00
Specialized KVK for Livestock and Poultry	2016	ICAR	15,00,000.00

18.Financial status of KVK, Namakkal

Schemes	Opening balance as on 01.04.2017 (Rs.)	Receipts during 2017-18 (Rs.)	Expenditure incurred during 2017-18 (Rs.)	Closing balance as on 31.03.2018 (Rs.)
Revolving Fund	5,10,274	35,81,902	33,39,514	7,52,662
PPP fodder seed scheme	20,14,846	63,18,359	59,48,444	23,84,761
PPP fruit saplings	1,85,413	7,77,916	5,07,134	4,56,195

19. Budget - Details of budget utilization (2017-18)

S. No.	Particulars	Sanctioned (Rs.)	Released (Rs.)	Expenditure upto 31.03.2018 (Rs.)
A	**Recurring Contingencies**			
A.1	Pay & Allowances	10790000	10790000	10790000
A.2	Traveling allowances	145000	145000	145000
A.3.	**Contingencies**			
a	Stationery, telephone, postage and other expenditure on office running, publication of Newsletter and library maintenance (Including Swachhta action plan during 2017-18 Rs. 25000.00)	355000	355000	355000
b	POL, repair of vehicles, tractor and equipments	275000	275000	275000
c	Meals/refreshment for trainees	138150	138150	138150
d	Training material	20000	20000	20000
e	Training of extension functionaries	60000	60000	60000
f	Publication of extension literature of farmers and extension functionaries	10000	10000	10000
g	Honorarium of trainer	5000	5000	5000
h	On farm testing	69450	69450	69450
i	Frontline demonstration	281400	281400	281400
j	Kisan mela/farmers fair at KVK farm	45000	45000	45000
k	Library	20000	20000	20000
l	Maintenance of farm	25000	25000	25000
m	EDP	30000	30000	30000
n	IFS	16000	16000	16000
o	FFS	30000	30000	30000
p	Establishment of Soil, Plant & Water Testing Laboratory	100000	100000	100000
q	Soil day	80000	80000	80000
	Total contingencies	1560000	1560000	1560000
	Total Recurring	**12495000**	**12495000**	**12495000**
B	**Total Non Recurring**	0.0	0.0	0.0
	GRAND TOTAL (A+B)	**12495000**	**12495000**	**12495000**

FARMERS FIELD SCHOOL (FFS) ON IPM IN GROUNDNUT

Place: Moolakaadu, **Block:** Vennandhur

Total trainees: 25 farmers + 5 apprentice officers **Season: –** Rabi – 2017

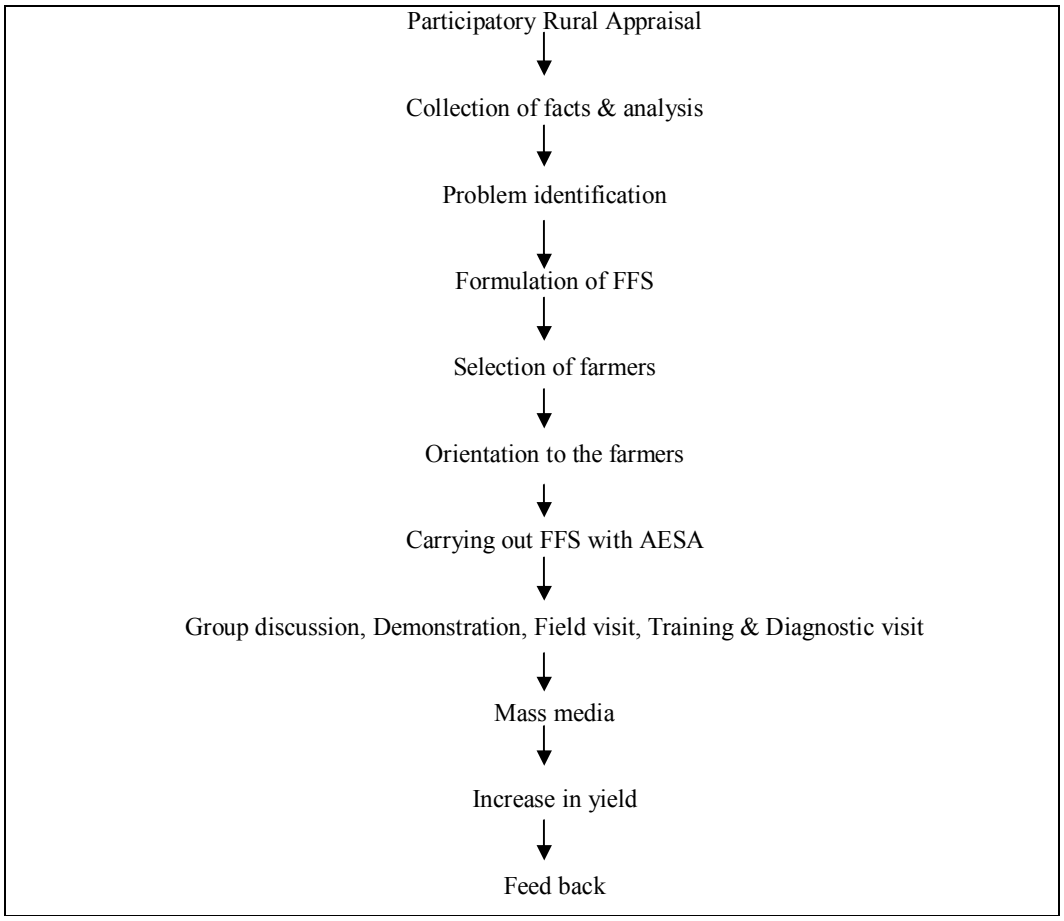
Scenario of Moolakkadu

- Area under Ground nut cultivation in moolakkadu village : 125 ha
- Name of Zone : North Western Zone
- Farming situation in the dist. : Rainfed (Kharif)
- Rainfall : 908 mm
- Maximum Temperature : 32.26º C
- Minimum Temperature : 18.44 º C
- Relative Humidity : 92.99% to 53.75.%
- No. of Rainy days : 5 days
- Productivity (average) : 22 q/ha
- Soils : Clay loam,
- Existing Cropping pattern : Groundnut – Monocropping

Methodology of conducting FFS

Bench mark survey

A PRA exercise was conducted and all relevant information's like cropping system, intercropping, average yield level of groundnut , local practices adopted in terms of irrigation, use of fertilizer, plant protection, problems exists in groundnut, etc were collected. Based on the study and problems identified detailed FFS and its components were formulated by the team of our technical staff. Finally it was decided to demonstrate the IPM technologies in groundnut. 25numbers of farmers were selected representing villages. They were given orientation first by explaining the problem, need for FFS, procedure they have to follow, production technologies, etc. The farmers were convinced to grow groundnut. Demonstrations were conducted in step by step manner from seed treatment with bio fertilizers, sowing, manuring, micronutrient application, pest and disease diagnosis etc, in order to educate them in all the required aspects with AESA



Hence, Moolakkadu village was selected based on the survey done with the help of ADA, vennathur and scientist from KVK, Namakkal

Problems identified

- Mono cropping
- Seed treatment for disease management is not followed
- Poor weed management
- Maintenance of poor plant population
- Indiscriminate use of inorganic fertilizers
- Lack of knowledge on micronutrient management
- Lack of knowledge on biological control of pest and disease
- Indiscriminate use of insecticides (60 ml / tank)
- Lack of awareness on IPM practices for pest management
- Lack of knowledge on nutrient deficient and their management

KVK interverntion

- Soil Sampling and Analysis
- Village selection and Bench mark survey
- Pre-Evaluation Test-Ballot Box method about IPM
- Climatic requirement and Groundnut plant characters & Physiology
- Groundnut– CO-6 seeds(Drought tolerant variety) – 200 kg/ha
- Seed treatment (P.fluorescens) 10g/kg + soilapplication(P.fluorescens 2.5kg/ha) on 30 DAS
- TNAU Groundnut rich – 6 kgs/ha
- Setting up of Pheromone trap @ 12/ ha for *Spodaptera litura*
- Setting up of Yellow Sticky trap @ 12 nos/ha
- Trap crop of caster
- Intercrop of pulses (4:1) ratio
- Need Based application of NSKE 5%
- Need application of Difenconazole @ 500 ml/ha
- Groundnut Varieties, Planting method & population maintenance & Inter cropping
- Installation of Yellow sticky Trap, Pheromone trap, solar light trap & its importance
- IPM in Groundnut
- IDM in Groundnut
- Water & Fertilizer management
- Micro Nutrient Management
- Preparation & Usage of Botanical pesticide (Neem, Garlic & Chilli, Panchakavya, pest repellent, amirtha karaisal)
- Intercropping in groundnut
- Effects of pesticide on predators & parasites
- Post harvest technology
- Post-Evaluation Test-Ballot Box method about IPM
- Field day

Annexure - I

(CURRICULAM FOR FOURTEEN SESSIONS)

S. No	Sessions and Date	Activities	Facilitators/Resources Persons
1	I (7.12.2017)	➢ Village selection and Bench mark survey along with state Department through PRA exercise	Entomologist with senior scientist and head
2	II (7.12.2017)	➢ Registration ➢ Inauguration ➢ Pre-Evaluation Test-Ballot Box method about IPM ➢ Introduction to FFS	Entomologist with SRF

		➢ Group Dynamics(GD)-Introducing each other ➢ Planning for Next Session ➢ Soil sample collection method	
3	III (14.12.2017)	➢ Recapitulation ➢ Group formation & Leader selection(5 groups) ➢ Field walk ➢ Collection of flora & Fauna in the Groundnut eco system ➢ segregation of Pests & Defenders **Special Topic** ➢ Climatic requirement and Groundnut plant characters & Physiology ➢ Group Dynamics – Rain clap ➢ Planning for Next Session	Agronomist, Entomologist with SRF
4	IV (14.12.2017)	➢ Recapitulation ➢ Introduction to Agro Eco Systems Analysis(AESA) **Special Topic** ➢ Groundnut Varieties, Planting method & population maintenance & Inter cropping ➢ IPM approach for seedling diseases ➢ Group Dynamics – Communication Exercise ➢ Planning for Next Session	Agronomist, Entomologist with SRF
5	V (20.12.2017)	➢ Recapitulation ➢ Agro Eco System Analysis(AESA) ➢ Observation, Drawing & Presentation **Special Topic** ➢ IPM approach for management of Insect Pests ➢ Installation of Yellow sticky Trap, pheromone trap, solar light trap & its importance ➢ Group Dynamics – Probability Test ➢ Planning for Next Session	Entomologist, SRF and FAO resource person
6	VI (20.12.2017)	➢ Recapitulation ➢ Agro Eco System Analysis(AESA) Observation, Drawing & Presentation **Special Topic** ➢ IDM in Groundnut ➢ Group Dynamics ➢ Planning for Next Session	Entomologist with SRF
7	VII (27.12.2017)	➢ Recapitulation ➢ Agro Eco System Analysis(AESA), Observation, Drawing & Presentation **Special Topic** ➢ Water & Fertilizer management ➢ Group Dynamics(GD)-Water Brigade ➢ Planning for Next Session	Entomologist, Soil Scientist with SRF
8	VIII (27.12.2017)	➢ Recapitulation ➢ Agro Eco System Analysis(AESA), Observation, Drawing &Presentation ➢ Comparison on IPM & Non-IPM field **Special Topic** ➢ Micro Nutrient Management ➢ Group Dynamics-Tower building ➢ Planning for Next Session	Entomologist, Soil Scientist with SRF

9	IX (3.1.2018)	➢ Recapitulation ➢ Agro Eco System Analysis(AESA) - Observation, Drawing & Presentation ➢ Release of Egg Parasitoids **Special Topic** ➢ Preparation & Usage of Botanical pesticide (Neem, Garlic & Chilli, Panchakavya, pest repellent, Amirtha karaisal) ➢ Group Dynamics-Draw the object without lifting of pen ➢ Planning for Next Session	Entomologist with SRF
10	X (3.1.2018)	➢ Recapitulation ➢ Agro Eco System Analysis(AESA)- Observation, Drawing & Presentation ➢ Release of Predators **Special Topic** ➢ Intercropping in groundnut ➢ Group Dynamics(GD)-Ball throwing ➢ Planning for Next Session	Agronomist, Entomologist with SRF
11	XI (10.1.2018)	➢ Recapitulation ➢ Agro Eco System Analysis(AESA) ➢ Observation, Drawing & Presentation **Special Topic** ➢ Effects of pesticide on predators & parasites ➢ Planning for Next Session	Entomologist with SRF
12	XII (10.1.2018)	➢ Recapitulation of all sessions activities ➢ Comparison of IPM & Non-IPM field **Special Topic** ➢ Post harvest technology ➢ Planning for Next Session	Agronomist, Entomologist with SRF
13	XIII (24.1.2018)	➢ Post Evaluation Test By ballot box method ➢ Discussion on formation of IPM club & community IPM for lateral spread ➢ Planning for field day	Entomologist with SRF
14	XIV (20.2.2018)	➢ Field day with FFS and Non FFS farmer	All Scientist with senior scientist & Head from KVK, Namakkal and line department of Agriculture

Group meeting

Before commencement of the regular session in FFS, group meeting was organized during the season. Discussion was made on the importance of IPM harmful effects of pesticides and relevant subjects. Farmers were selected based on their attitude interest and keenness of participation.

Among the farmers, five leading and progressive farmer were selected based on their experience and knowledge. Farmers were divided into different groups like Spider group, Pheromone trap group, Wasp group, Yellow sticky trap group, Coccinellid group, Chrysopha group etc. and also to allotted field in each group for demonstration

IPM kit

All the trainees were provide the IPM kit namely, Pheromone trap, Yellow sticky trap, Polythene bag, lens, insect box, Kit bag, cap, insect net, pocket note, scribbling pad and bioagents.

Documentation

All the activities undertaken in the demonstration sites have been recorded in the register accordingly. The records have been maintained by KVK scientist

A. Observed Status of Pest incidence on ground nut with AESA

S.No	Name	Scientific Name	Crop stage	Status	
				FFS	Non FFS
1	Aphids	*Aphis cracivora*	Seedlings and Vegetative phase	Minor	Major
2	Leaf miner	*Aproaerema modicella*	Vegetative phase	Minor	Major
3	Cut worm	*Spodoptera litura.*	Vegetative and peg formation	Minor	Major
4	Jassids	*Empoasca kerri*	Vegetative phase	Minor	Major
5	Thrips	*Thrips palmi*	Vegetative and peg formation	Minor	Major

6	Defoliator	*Helicoverpa armigera.*	Vegetative and peg formation	Minor	Major
7	Whitefly	*Bemisia tabaci*	Vegetative – harvest	Major	Major

A. Observed Status of diseases on ground nut with AESA

S.No	Name	Scientific Name	Crop stage	Status	
				FFS	Non FFS
1	Aspergillus crown rot	*Aspergillus niger*	Seedling and peg formation	Minor	Major
2	Alternaria leaf spot	*Alternaria arachidis*	Vegetative phase	Minor	Major
3	Alternaria leaf blight	*Alternaria tenuissima*	Seedlings and Vegetative stage	Minor	Major
4	Leaf spot (early)	*Cercospora arachidicola*	Vegetative phase	Minor	Major
5	Leaf spot (late)	*Phaeoisariopsis personata*	Vegetative and peg formation	Major	Major
6	Stem rot	*Sclerotium rolfsii*	Vegetative and peg formation	Major	Major
7	Root rot	*Rhizoctonia bataticola*	Harvesting stage	Minor	Major

D. Observed Natural Enemies on groundnut pest

S.No.	Natural Enemies	Host
1.	Coccinellid spp.	Aphids
2.	Syrphid fly	Aphids
3.	Green lacewing or Chrysoperla	Soft bodied insects
4.	Spider	Soft bodied insects
5.	Praying mantis	Soft bodied insects
6.	Wasps	Soft bodied insects

E.Impact of FFS

Farming situation	Varieties		No. Farmer	Area (ha)	Average seed Yield(q/ha)		% increase in yield	Cost of cultivation (Rs.)		C:B ratio	
	FFS	Non FFS			FFS	Non FFS		FFS	Non FFS	FFS	Non FFS
Irrigated	CO-6	CO-6	25	20	13.60	10.50	29.52	25500	29500	2.67	1.78

F.Pesticide Reduction:

Sl. No.	Name of village	No. of Spray/ha		Cost of Spray (Rs./ha)		Reduction in Cost of spray by IPM farmers compared to non IPM farmers (Rs./ha)	Net income	
		FFS farmers	Non FFS farmers	FFS farmers	Non FFS farmers (Rs.)		FFS	Non FFS
1	Moolakkadu	3	7	3000	4500.00	1500.00	42500	23000

G.Parameters observed with AESA

S.No.	Parameters	FFS	Non FFS
1	Germination %	90.00	80.00
2	Plant height (cm)	32.00	20.80
3	No of pods per plant	25.50	20.25
4	No. of infested plant / m2 (before treatment)	0.25	10.74
5	No. of infested plant / m2 (after treatment)	0.50	2.50
6	Yield (Q/ha)	13.60	10.50
7	Cost of cultivation/ha	25500	29500
8	Gross income/ha	68000	52500
9	Net income/ha	42500	23000
10	B.C. Ratio/ha	2.67	1.78
11	Yield Increased (%)	29.52%	

Field day

ICAR- Krishi Vigyan Kendra, Namakkal have successfully conducted Field Day under FFS Programme at Moolakkadu village on 20.02.2018.Dr N.Akila.Senior scientist &Professor and Head, Thiru. P. Ashokan, Dubty Director of Agriculture, Mr. C. Sankar, Assistant Professor (Agricultur Entomology), Dr.P.Murugan (Agronomay), Dr. S. Sathya, Assistant Professor (Soil Science), Krishi Vigyan Kendra, Namakkal and Thiru.S. Sounthanr, Assistant

Director of Agriculture and All AAOS from vennathur block and non FFS farmers were participated in this function and two field officers from ATMA have facilitated the function.

Thiru. P. Ashokan, Dubty Director of Agriculture has inaugurated the FFS exhibition followed by release of pamphlet on IPM for sucking pest management in Groundnut. He has given keynote address and he emphasized that all the Groundnut farmers should involve in this FFS. Followed by ADA, Vennathur has explained about the FFS and to get additional income through intercropping with pulses.

Initially Thiru. C.Sankar Assistant Professor (Entomology), Krishi Vigyan Kendra, Namakkal has given the welcome address. Dr N.AKILA.Senior scientist &Professor and Head Krishi Vigyan Kendra, Namakkal, has given the presidential address, she said that ground nut cultivation is more in moolakau village.. So all ground nut farmers should follow this Inter cropping of pulses with IPM and get additional income followed by FFS . A special address was given by Thiru. P. Ashokan, Dubty Director of Agriculture has explained about Groundnut marketing and grading, Technical lectures has given by Dr. S. Sathya, Assistant Professor (Soil Science), Krishi Vigyan Kendra, Namakkal about soil nutrient management due to Less peg formation and Thiru.C.Sankar has given a special address about the pest and disease management in ground nut and recommended to spraying of groundnut rich and traps.. Finally, FFS farmer has given the vote of thanks.

Exhibition

During FFS Field day, KVK FFS farmer exhibited the groundnut related technology on ICM, IPM , IDM and what they have recorded in FFS field. Also, exhibited different groundnut farm implements, leaflet, pamphlet, books and IPM based critical bio inputs etc. and private pesticide company also exhibited groundnut related pesticides .Many farmers have visited the exhibition stall and they gathered the knowledge from the stall and will go to adopt the emerging technology in future.

Feed Back About Kisan mela

Farmers expressed their satisfaction about the spraying of groundnut and organic manure spray before applying and after applying of crop. Interaction played good platform to learn on various technologies in FFS.

Feedback:

- Farmers expressed that due to the demonstration of organic based insect pest management with production technologies through FFS, they got increased yield. The quality of the Seed very good. This will fetch good returns to them.

Feedback from farmers under FFS

- As farmers said that we receive the technical assistance in time we could take up control measures in time that helps in control of insect pest fully and timely. This in turn helps us to reap good yield without much of loss.
- Farmers shared their views of performance of AESA technique we are glad that various scientists from KVK have visited our village and given advice on farming aspects especially the groundnut. Therefore we are grateful to receive all of them and we enjoyed the technological benefit.
- As we receive the technical assistance in time we could take up control measures in time that helps in control of insect pest fully and timely. This in turn helps us to reap good yield without much of loss

Utilization of budget

S. No	Items	Total amount
1	Refreshment @ Rs. 20/- trainee for 14 number of programmes (30x20x14)	Rs. 8,400/-
2	Expenditure on POL / hiring of vehicles	Rs.2,500 /-
3	Contingents expenditure, Banners and refreshment for inaugural function of FFS	Rs.1,800 /-
4	Distribution of (i). cost of training materials including IPM kit @Rs. 150/kit =Rs. 4,500/- (ii). Cost of pheromones/bio pesticides, emergency spray. Other relevant IPM literature for @ Rs. 100 per trainee	Rs. 9.800/- -
5	Distribution of IPM literature for 30 trainees @ Rs. 100 per trainee	Rs.3,000 /-
6	Farmers Field Day (one day) Miscellaneous contingent expenditure including refreshment	Rs.1,500 /-
7	Honorarium for two facilitators /trainers @ Rs.1500/- each for complete season	Rs. 3,000/-
	Total	**Rs.30,000 /-**

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