PROFORMA FOR PREPARATION OF ANNUAL REPORT 2019-20
(April 2019-March 2020)
APR SUMMARY

Name of the KVK: ICAR- KVK, Namakkal

1. Technology Assessment

Category	No. of Technology Assessed & Refined	No. of Trials	No. of Farmers
Technology Assessed			
Crops	8	50	50
Livestock	1	5	5
Various enterprises			
Total	**9**	**55**	**55**
Technology Refined			
Crops			
Livestock			
Various enterprises			
Total			
Grand Total	**9**	**55**	**55**

2. Frontline demonstrations

Details	No. of Farmers/Locations	Area (ha)	Units/Animals
Oilseeds	174	69.6	0
Pulses	200	80	0
Cereals	10	4	0
Vegetables	151	39.4	0
Other crops – Commercial crops	15	5	0
Fruits	10	3	0
IFS &Composting	13	1.3	0
Total	**573**	**202.3**	**0**
Livestock & Fisheries	37	0	67
Other enterprises - Poultry	20	0	100
Total	**57**	**0**	**167**
Grand Total	**630**	**202.3**	**167**

3. Training Programmes

Clientele	No. of Courses	Male	Female	Total participants
Farmers & farm women	103	1991	835	2826
Rural youths	17	361	196	557
Extension functionaries	22	712	232	944
Sponsored Training	25	878	268	1146
Vocational Training	4	38	62	100
Total	**171**	**3980**	**1493**	**5573**

4. Extension Programmes

Category	No. of Programmes	Total Participants
Extension activities	516	45500
Other extension activities	13	10600
Total	**529**	**56100**

5. Mobile Advisory Services

Message Type	Crop	Livestock	Weather	Marketing	Awareness	Other enterprise	Total
Text only	4716	399	167508	0	557	237	173417
Voice only	0	0	0	0	0	0	0
Voice & Text	0	0	0	0	0	0	0
Total	**4716**	**399**	**167508**	**0**	**557**	**237**	**173417**

6. Seed & Planting Material Production

	Quintal/Number	Value Rs.
Seed (q)	283.742	11538992
Planting material (No.)	101738	302805
Bio-Products (kg)	5228.7	353985
Livestock Production (No.)	18729	1342008
Fishery production (No.)	1002500	597500
Other inputs (Kg)	6009.9	573365

7. Soil, water & plant Analysiss

Samples	No. of Beneficiaries	Value Rs.
Soil	810	138750
Water	311	28870
Plant	10	800
Total	**1131**	**168420**

8. HRD and Publications

Sr. No.	Category	Number
1	Workshops	6
2	Conferences	9
3	Meetings	58
4	Trainings for KVK officials	14
5	Visits of KVK officials	1
6	Book published	3
7	Training Manual	4
8	Book chapters	3
9	Research papers	9
10	Lead papers	0
11	Seminar papers	7
12	Extension folder/Pamphlets	34
13	Proceedings	1

DETAILED PROGRESS REPORT 2019-20

1. GENERAL INFORMATION ABOUT THE KVK

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

a) Name of the KVK	:	**ICAR-Krishi Vigyan Kendra, Namakkal**
b) Address	:	Veterinary College and Research Institute Campus, Namakkal - 637 002, Tamil Nadu.
c) Landline Phone No.	:	04286 - 266345, 266650
d) Fax No.	:	-
e) Official Mobile No.	:	-
f) email ID	:	kvk-namakkal@tanuvas.org.in, kvknamakkal.2004@gmail.com

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

a) Name of the Host Organization	:	Tamil Nadu Veterinary and Animal Sciences University
b) Address	:	Madhavaram Milk Colony, Chennai - 600 051.
c) Landline Phone No.	:	044 -25551584
d) Fax No.	:	044- 25551585
e) Official mobile No.	:	-
f) email ID	:	registrar@tanuvas.org.in

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

a) Name	:	Dr.N.Akila
b) Phone - residence	:	-
c) Mobile	:	97908 85431, 89039 32591
d) email ID	:	akila2528@gmail.com

1.4. Year of sanction: 2004

1.5. Staff Position (as on 31th March, 2020)

Sl. No.	Sanctioned post	Name of the incumbent	Designation (eg. SMS)	Discipline (eg. Agronomy)	Edn. Qualification (eg.M.Sc.(Agri)	Specialization (if applicable) eg.Agronomy	Pay Scale (Rs.)	Present basic (Rs.)	Date of joining	Permanent /Temporary	Category (SC/ST/ OBC/ Others)
1	Programme Coordinator	Dr.N.Akila	SS&H	Animal Science	M.VSc.,Ph.D.,	Veterinary Extension	144200-218200	157600	16.12.15	Permanent	OBC
2	Subject Matter Specialist	Dr.C.SharmilaBharathi	SMS	Horticulture	M.Sc.,Ph.D.,	Horticulture	79800-211500	101100	25.05.06	Permanent	OBC
3	Subject Matter Specialist	Dr. P.Murugan	SMS	Agronomy	M.Sc.,Ph.D.,	Agronomy	68900-205500	89900	23.06.17	Permanent	OBC
4	Subject Matter Specialist	Dr.K.R. Pushpanathan	SMS	Agronomy	M.Sc.,Ph.D.,	Agronomy	68900-205500	92600	23.08.18	Permanent	OBC
5	Subject Matter Specialist	Dr.Hariharan	SMS	Animal Science	M.VSc.,	Animal Nutrition	68900-205500	77600	23.10.19	Permanent	OBC
6	Subject Matter Specialist	Dr. S.Sathya	SMS	Soil Science	M.Sc.,Ph.D.,	Soil Science and Agricultural Chemistry	57700-182400	73000	18.11.15	Permanent	OBC
7	Subject Matter Specialist	Dr.S.Paulpandi	SMS	Fisheries	M.FSc.,Ph.D.,	Aqua Culture	57700-182400	64900	18.11.15	Permanent	SC
8	Programme Assistant	Tmt.R.Palaniammal	PA	--	B.Com	--	35900-113500	26100	11.6.19	Permanent	OBC
9	Computer Programmer	Th.K.Sundaraganesan	PA	--	H.Sc.,DECE	--	20600-65500	30300	7.12.18	Permanent	SC
10	Farm Manager	Tmt. M. Daisy	FM	Agronomy	M.Sc., Ph.D.,	Agronomy	35900-113500	59200	25.05.06	Permanent	SC
11	Accountant / Superintendent	Tmt. M. Chandrika	AS	--	SSLC	--	36900-116600	46700	7.12.18	Permanent	SC
12	Stenographer	Vacant		--	--	--			--	Permanent	OBC
13	Driver	Th. T.Puttasamy	Driver	--	XII Std	--	19500-62000	31300	10.02.14	Permanent	OBC
14	Driver	Vacant		--	--	--			--	Permanent	OBC
15	Supporting staff	Tmt. M.Nagammal	SS	--	--	--	15700 - 50000	28400	14.09.05	Permanent	OBC
16	Supporting staff	Th.M.Periyasamy	SS	--	IX Std	--	15700-50000	24500	20.11.12	Permanent	SC

1.6. Total land with KVK (in ha) (Consolidated figure):

S. No.	Item	Area (ha)
1	Under Buildings	1250 Sq.m
2.	Under Demonstration Units	5634.73 Sq.m
3.	Under Crops	7.24 ha
4.	Orchard/Agro-forestry	2.6 ha
5.	Others (specify)	-

S. No.	**Item**	**Area (ha)**
1	**Under Buildings**	**1250 Sq.m**
2	**Under Demonstration Units**	
	a) **Goat Shed**	
	Slatted floor shed for goat	57.50 Sq.m
	Slatted floor shed for sheep	42.00 Sq. m
	Slatted floor shed for kids and lambs (ICAR Funding)	57.80 Sq.m
	b) **Dairy Shed**	52.03 Sq.m
	c) **Desi bird shed**	
	Deep litter system	33.70 Sq.m
	Cage for Chicks	34.80 Sq.m
	Semi-intensive shed for alternate poultry	193.4 Sq.m
	d) Piggery shed	23.23 Sq. m
	e) Ornamental fish hatchery	40.00 Sq.m
	f) Fish unit- fingerlings management	1000 Sq.m
	g) Natural fish pond (earthen)	2500 Sq.m
	Under Crops	
	a) Total cropped area	
	(Agricultural and Horticultural crops)	7.28 ha.
	b) Total non cropped area	
	(using for livestock grazing land**)**	12.5 ha
	Other units	
	c) Shade net- Azolla Production unit	121.41 Sq.m.
	d) Shade net- poly bag nursery (Fruit and vegetable saplings)	198.00 Sq.m.
	e) Coconut nursery	40.00 Sq.m.
	f) Mushroom unit	6.50 Sq.m
	g) Vermi compost unit New (2 nos.)	45 Sq.m
	h) Automatic Weather station	45.00 Sq.m
	i) Honey Bee unit	0.3 Sq.m.
	j) Green fodder demo unit	40 sq.m.
	k) Crop waste Composting pit (open method)	8.0 sq.m
	l) Crop waste Composting pit – Shade net with ten rings having 2 t capacity	6.0 sq.m
	m) Lazer drip model unit (Groundnut)	800 sq.m.
	n) Rain water Harvesting Structure	20.06 sq.m.
	o) Fodder protein bank –Agathi trees	40.00 Sq.m.
	p) Bio-inputs production units	10.00 Sq.m.
	q) Horticulture - OFT & FLD demo plot	60.00 sq.m
	r) Fodder protein bank –Agathi trees.Subabul, Glyricidia, kalyanamurungai,Kadambu, kodukapuli. Annual moringa.	160.00 sq.m
3.	**Under Crops**	
	Foxtail millet	0.20 ac
	Black gram	0.45 ac
	Green gram	0.20 ac

	Castor var: YRCH 1	2.00 ac
	Model Organic crop cafeteria (Greens, Cowpea, Groundnut, Pulses, Coriander)	0.25 ac
	Progeny Orchard -Fruit Trees (Pome, Amla, uava, Lime, Sapota, Naval) + inercrop vegetable cowpea	2.5 acre
	Vegetable crops - Cluster bean	2.5 acre
	Tree crops-*Magnolia sp., Mimusops sp., Bauhinia, sp., albizia sp., Syzygium sp.,* (Convergence with District Forest Department, Namakkal)	4.00 ac
	Fodder seed production	5.00 ac
	Green manuring and Maize	2.50 ac
	Sub total	**24.6 acre / 9.84 ha**

1.7. Infrastructural Development:

A) Buildings

S.No.	Name of building	Source of funding	Stage					
			Complete			Incomplete		
			Completion Date	Plinth area (Sq.m)	Expenditure (Rs.)	Starting Date	Plinth area (Sq.m)	Status of construction (Completed/ in progress/ to be initiated)
1.	Administrative Building	ICAR	29.10.2008	550.0	45.13		--	Completed
2.	Farmers Hostel	ICAR	29.10.2008	300.0	30.52		--	Completed
3.	Staff Quarters (No.)							
	1. Supporting staff Quarters.	ICAR	29.10.2008	100.0	44.35		--	Completed
	2. Subject matter specialist Quarters	ICAR	29.10.2008	300.0			--	Completed
4.	Demonstration Units							
	1.Goat unit	ICAR	09.10.2009	57.8	2.98		--	Completed
	2.Desi bird unit	ICAR	09.10.2009	66.26	2.98		--	Completed
	3.Composting pit	ICAR	25.05.2018	40.0	8500		--	Completed
	4.Mushrom production unit	ASCI ATARI	25.03.2018	352.0	95000.00		--	Completed
5	Fencing	ICAR	09.06.2008	980 RM	3.13		--	Completed
6	Rain Water harvesting system	ICAR-RF		20.06			--	Completed
7	Threshing floor	PPP fodder	27.03.2018	30 x 30 ft	1,38,804		--	Completed
8	Seed godown	ICAR-RF		28 x 16 ft	10,000,00		--	Is in progress
9	Shed (Farm equipment)	--	--	--	--	--	--	Completed

10	Rural Bank, Agri mart (Sales and store room) and Community Radio Station	ICAR, TANU VAS, ATMA	--	163.14	88.95	--	--	Completed
11	Animal laboratory	ICAR	--	100.0		--	--	Completed
12	Compound wall	ICAR	03.03.2008	174 m	4.70	--	--	Completed
13	New bore well	ICAR	22.06.2017	--	2.00	--	--	Completed
14	Energizing bore well		29.08.2007	--	0.58	--	--	
15	Vehicle shed 1 Vehicle shed 2	ICAR	--	--	--	--	--	Completed
16	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	--	--	Completed

B) Vehicles

Type of vehicle	Year of purchase	Cost (Rs.)	Total kms. Run	Present status
Tractor	2005	4,99,997	2140 hrs.	Under repair
TVS Star city	2006	39,996	68911	Good
Honda Aviator	2009	49,925	38810	Good
Tempo Traveller (Force)	2012	(Transferred from FTC, Theni)	65536	Good
Jeep(Mahindra Bolero)	2017	737664.00	23515	Good

C) Equipment & AV aids

Name of the equipment	Year of purchase	Cost (Rs.)	Present status
Computer system	31.03.2005	33414.40	In working condition
Xerox machine	31.03.2005	34362.51	”
HCL Laptop	30.03.2007	23680.32	”
Total Mixer Ration (TMR) feed plant	31.03.2009	69031.81	”
PA systems	31.03.2009	18791.93	”
Generator	31.03.2010	129290.14	”
Power Tiller	31.03.2010	88573.50	”
Brush cutter	20.03.2009	10602.25	”
LCD TV	28.07.2010	10679.58	”
Deep Freezer with Stabilizer	15.09.2010	13476.03	”
Refrigerator 280 lt	28.07.2010	12731.17	”
UV Spectrophotometer	31.03.2011	268778.53	”
Flame Photometer	30.03.2011	41052.01	”
Nitrogen Analyser	31.03.2011	245325.29	”
Electronic weighing balance	31.03.2011	40022.10	”
Portable Carp Hatchery unit	20.03.2011	94191.21	”
Laptop	21.11.2012	23545.00	”

Multi functional printer	08.11.2012	59116.00	”
Rotavator	31.03.2014	53796.00	”
Sony LED TV	16.09.2014	59209.00	”
PUSA STFR soil testing kit	16.02.2016	72500.00	”
MRIDAPARIKSHAK Mini soil testing lab	27.03.2017	90300.00	”
LCD projector	31.03.2017	27500.00	”
CCTV camera	31.03.2017	20000.00	”
Samsung LED monitor	31.03.2017	23400.00	”
Desktop dell	31.03.2017	31600.00	”
LCD screen logic wall mounted	31.03.2017	12850.00	”
Lenova tablet	31.03.2017	17000.00	”
Sony projector	31.03.2017	30750.00	”
Sony Digital camera	31.03.2017	26000.00	”
Desktop dell	31.03.2017	28300.00	”
Laminar Air Flow	31.03.2017	71420.00	”
Double distillation unit	31.03.2017	47600.00	”
Hot air oven digital	31.03.2017	19045.00	”
Autoclave	31.03.2017	19045.00	”
Elctronic microscope - olympus	31.03.2017	142550.00	”
Lab equipment work table	31.03.2017	95200.00	”
Weighing bridge	31.03.2017	45000.00	”
Shed cleaner	31.03.2017	30000.00	”
Brush cutter	31.03.2017	25000.00	”
Refrigerator	31.03.2017	25000.00	”
Milking machine	31.03.2017	50000.00	”
Bolero jeep	31.05.2017	737664.00	”
Sand bath	28.03.2018	11505.00	”
HP Laser Jet Pro printer - 1	28.03.2019	15200.00	”
HP Laser Jet Pro printer - 1	28.03.2019	15200.00	”

1.8. A). Details SAC meeting(s) conducted in the year

Sl.No.	Date	No of Participants	Salient Recommendations
1.	10.3.2020	60	• Feed back should be taken up for all programmes implemented by KVK. • Awareness about alternative enterprises in farming system may be encouraged. • Status of already implemented interventions should be studied while introducing new interventions. • NABARD schemes may be popularized among farmers. • SOP for all crops and technologies may be developed and distributed to the needy farmers. • Guidelines for safe disposal of waste in poultry and other livestock farms should be framed and circulated to concerned entrepreneurs developed by KVK. • Based on the farmers preference, suitable rice varieties have to be popularized in Kollihills. • Organic growers with organic certification can be utilized to promoteecotourism developed by the Dept. of Forest, Namakkal. • Role of cow urine in organic farming may be studied. • 10 cent fodder production model/suitable model should be developed/propagated. • Utility of different biological materials in biogas model may be studied. • Efforts to be taken to publish more research articles in quality journals as a follow up ofpresenting research abstracts. • Awareness about mobile app has to be created among the farmers. • Water management practices may be popularized for minimal water utilization and maximum production. • One-page write-up of successful intervention of KVK infarmer's field to be published in KalnadaiKathir. • Technical output for all KVK programmes should be studied. • More number of paid trainings have to be conducted based on the need of farmers. • Processing machinery unit can be established through custom hiring method. • Quality seeds should be supplied tothe farming communitybased on need. • Feed back should be taken up for all programmes implemented by KVK. • Awareness about alternative enterprises in farming system may be encouraged. • Status of already implemented interventions should be studied while introducing new interventions. • NABARD schemes may be popularized among farmers. • SOP for all crops and technologies may be developed and distributed to the needy farmers. • Guidelines for safe disposal of waste in poultry and other livestock farms should be framed and circulated to concerned entrepreneurs developed by KVK. • Based on the farmers preference, suitable rice varieties have to be popularized in Kollihills. • Organic growers with organic certification can be utilized to promoteecotourism developed by the Dept. of Forest, Namakkal. • Role of cow urine in organic farming may be studied. • 10 cent fodder production model/suitable model should be developed/propagated. • Utility of different biological materials in biogas model may be studied. • Efforts to be taken to publish more research articles in quality journals as a follow up ofpresenting research abstracts.

			• Awareness about mobile app has to be created among the farmers. • Water management practices may be popularized for minimal water utilization and maximum production. • One-page write-up of successful intervention of KVK infarmer's field to be published in KalnadaiKathir. • Technical output for all KVK programmes should be studied. • More number of paid trainings have to be conducted based on the need of farmers. • Processing machinery unit can be established through custom hiring method. • Quality seeds should be supplied tothe farming communitybased on need. • OFTs have to be taken-up to produce aflatoxin free milk in Namakkal. • Tapioca variety YTP2 and Perennial castor variety YTP1 can be popularized. • Castor seeds to be purchased and supplied to farmers from TCRS, Yethapur. • Castor gold and cassava booster to be purchased from TCRS, Yethapurat a concessional rate and popularized among farmers. • Drought tolerant fruit crops to be promoted • Drought tolerant cluster bean to be promoted • PPFM spray to be popularized • Popularization of star jasmine to be done • African marigold dry flowers to be used in desi poultry feed and enriched fortified feed to be developed • Awareness and training programme on importance of including greens in diet to be conducted • Faculties from PGP College of Agrl. Sciences, Namakkal may be utilized as and when needed. • RAWE students of PGP College of Agrl. Sciences, Namakkal may be involved in KVK programmes. • Training on water management practices should be given. • TCRS tapioca varieties may be popularized • Jute cultivation may be popularized in Namakkal instead of Korai cultivation. • Drought tolerant tapioca varieties should be popularized. • Mealy bug mother culture may be developed and supplied to farmers. • Suitable vegetable seed varieties forNamakkal to be identified and informed. • Bulb propagated small onion variety with long storage life may be popularized. • List of KVK trained farmers to be shared withFisheries Department for implementation of their schemes. • Ecotourism places of Dept. of Forest may be utilized to sell the organic certified farm products. • Protein garden may be established • Ecotourism places of Dept. of Forest may be utilized to sell the organic certified farm products. • Protein garden may be established • Awareness on water conservation should be given to the farmers. • Awareness about effective use of sewage water may be done. • Farmers may be motivated to produce value added products. • DIC centre may be contacted to start Agri based enterprises and establish markets. • Farmers may be motivated to produce value added products. • DIC centre may be contacted to start Agri based enterprises and establish markets. • Awareness programme on field bund cum trenches may be created. • Schemes available in NABARD may be utilized for FPOs.

			• Awareness on peacock control measures may be taken up. • Trainings may be given for salt water irrigation. • Drought tolerant castor varieties should be popularized. • Awareness programme on safe disposal of dead birds in poultry farming should be done • While stating new farms the farmer should be provided information on legal certification procedures if applicable • Training programmes on scientific poultry rearing may be given to avoid economic loss to the farmers • Provide trainingon IFS for organic promoting organic farm produce

2. DETAILS OF DISTRICT (2019-20)

2.0. Operational jurisdiction of KVKs: - Not Applicable

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

S. No	Farming system/enterprise
1	***Agricultural crops*** Pulses - Groundnut - Maize Pulses – Cotton / Sorghum Sorghum – Green gram / Groundnut Paddy –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*** 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, E78^{o}09.708' longitude with MSL 509.

2.3. Soil types in the jurisdiction

S. No	Soil type	Characteristics	Area in 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	77,357

		lime and moderately acid in reaction.	
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 jurisdiction for 2019-20

Kharif

S. No	Crop	Area (ha)	Production (Qtl)	Productivity (Qtl /ha)
1	Sorghum	76252	497925	6.53
2	Pearl millet	167	5344	32.0
3	Finger millet	486	17156	35.3
4	Foxtail millet	87	522	6.0
5	Little millet	367	3670	10.0
6	Redgram	639	4965	7.77
7	Greengram	4541	22160	4.88
8	Blackgram	1600	20800	13.0
9	Cowpea	588	4962	8.44
10	Mochai	135	945	7.00
11	Other Pulses	1964	19640	10.00
12	Groundnut	19624	131284	6.69
13	Sesame	464	1856	4.00
14	Castor	1300	19500	15.00
15	Banana	1989	9049950	4550
16	Mango	2393	1148640	480
17	Tomato	788	342780	4350
18	Brinjal	708	1670880	2360
19	Bhendi	482	60250	1250
20	Annual moringa	136	78880	580
21	Black pepper	1741	95755	55

Rabi

S. No	Crop	Area (ha)	Production (Qtl)	Productivity (Qtl /ha)
1	Paddy	7635	448938	58.80
2	Maize	9151	654662	71.54
3	Green gram	1855	9052	4.88
4	Black gram	745	9685	13.0
5	Bengalgram	308	2310	7.50
6	Horsegram	1191	10719	9.00
7	Groundnut	12440	83233	6.69
8	Cotton	1733	20102	11.6
9	Sugarcane	10812	7892760	730
10	Tapioca	16150	6460000	4000
11	Small onion	3451	5003950	1450
12	Chilies	285	64125	225
13	Ribbed gourd	202	25250	1250
14	Snake gourd	74	88800	120
15	Bitter gourd	68	13600	200

16	Lab lab	100	8000	80
17	Radish	199	23880	120
18	Cabbage	46	8280	180
19	Beans	5	350	70

Summer

S. No	Crop	Area (ha)	Production (Qtl)	Productivity (Qtl /ha)
1	Cotton	715	8294	11.6
2	Turmeric	2126	488980	230

(Source: Department of Agriculture and Horticulture, 2019-20)

2.5. Weather data (April 2019 to March 2020)

Month	Rainfall (mm)	Temperature°C		Relative Humidity (%)
		Maximum	Minimum	
April 2019	108.0	37.8	25.4	80
May 2019	73.2	37.7	25.0	80
June 2019	84.2	36.3	25.1	82
July 2019	6.2	35.7	25.5	80
August 2019	98.8	33.9	23.7	85
September 2019	222.6	33.8	23.8	87
October 2019	219.6	32.3	22.8	89.7
November 2019	94.8	31.9	21.9	92.2
December 2019	83.5	30.3	20.2	91.3
January 2020	0.0	32.3	19.1	91.2
February 2020	0.0	34.1	19.6	84.8
March 2020	0.0	36.4	22.5	83

(Source: AFAQAL, VC and RI, Namakkal-2)

2.6. Production and productivity of livestock, Poultry, Fisheries etc. in the district (2019-20)

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)
Indigenous			
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			
Hens			
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)

Category	Area	Production	Productivity
Fish	35ha	105ton	3.0ton/ha
Marine	0	0	0
Inland	35ha	105ton	3.0ton/ha
Prawn	0	0	0
Scampi	10	18	1.8/ha
Shrimp	5ha	45ton	9ton/ha

(Source: Animal Husbandry, Dairying and Fisheries Department, 2019-2020)

2.7. Details of Adopted Villages (2019-20)

Sl. No.	Taluk/ mandal	Name of the block	Name of the village	Year of adoption	Major crops & enterprises	Major problem identified	Identified Thrust Areas
KVK adopted villages							
1	Mohanur	Mohanur	Peramanda palayam	2014	Groundnut, Sorghum, Maize	Non availability of high yielding varieties, yield loss due to color rot and root rot diseases in groundnut, Fall armyworm incidence in Maize	Demonstration of high yielding groundnut varieties (CO-7), Black gram variety (VBN-8) along with ICM practices. Awareness cum Demonstration on Integrated pest and diseases management in groundnut and Maize Diagnostic field visit to Fall Armyworm management
2	Namakkal	Mohanur	Tholur & Aniyapuram	2018	Tuberose Marigold	Market fluctuation in marigold (Rs.5-10/kg), Low yield (4 t/ha) &Notpreferred for religious functions Seasonal	ICM practices in Chrysanthemum var.Co1
3	Rasipuram	Namagiri pettai	Kalkuruchi	2018	Tapioca	Low yielding varieties 12t/0.4 ha (Mulluvadi, H226 & white rose) Susceptible to CMD (95%) Low Starch content : 22-23%	High yielding variety having high starch content
4	Rasipuram/ Vennandur	Rasipuram/ Vennandur	Vadugampalayam & Sowthapuram	2017	Shrimp (Mineral Supplementation)	The imbalance in the ionic composition of water, causing poor growth, improper moulting and mass	Demonstration of high yielding shrimp culture. Awareness cum Demonstration on use of mineral Supplementation on Growth and Survival.

						mortality of shrimp.	
5	Rasipuram/ Pallipalayam	Rasipuram/ Pallipalayam	Singalandhapuram &Uppukulam	2017	Pangasius	Long growth period of carp result in poor growth in water scarcity areas High mortality of carps due to DO problem during rainfall at higher temperature and humid days	Introduction of high yielding variety and shrot culture days
6	Erumapatti	Erumapatti	Muttanchetti	2014	Small onion Fish waste	Basal rot incidence Lack of information on composting & enriched fish wasted and seaweeds.	Demonstration on biological method of basal rot management in small onion Demonstration on enriched fish waste and seaweeds compost preparation
7	Kollihills	Kollihills	Vasalurpatti Elangiyapatti Thinnanurnadu	2019	Black pepper Hill banana	Foot rot incidence in Black pepper Stem weevil incidence ,Fusarium wilt and nematode incidence in hill banana Unawareness about organic farming	OFT – Foot rot management in black pepper with method demonstration and trainings FLD –ICM Practices and banana pseudostem weevil management in Hill banana with method demonstration and trainings PKVY group formed for organic farming activities in Black pepper,Cardamom,Hill banana

						Unawareness about nutrigarden	and vegetables Dekmonstration on Nutrigarden in 2 KGBV school with method demonstration and trainings
DFI villages							
1	Rasipuram	Vennandur	Moolakadu	2018 & 2019	Groundnut, Sorghum, Maize , Black gram	Cultivation of local variety in Groundnut and Castor, Non adoption of ICM Practices, Incidence of root rot in Groundnut and Semiloopper in Castor. Poor utilization of farm resources, shortage of green fodder for livestock and less farm income.	Demonstration of High yielding groundnut variety (CO-7) & Castor hybrid (YRCH-1) and ICM Practices. Demonstration on Castor IPM practices through CFLD Programme. Method demonstration on groundnut seed treatment for control of root rot. Training on ICM in groundnut and Maize. Demonstration of integrated farming system for proper recycling of farm resources, green fodder production, sustainable farm income.
2				2019	Tomato	Indiscriminate use of pesticide	FFS – Pesticide residue free tomato cultivation crops
3				2019	Dairy	High feed cost	Unconventional feeds for livestock and sericulture.
4	Rasipuram	Namagiripettai	Ondikadai	2018 & 2019	Groundnut, Castor,	Non availability of high yielding	Demonstration of High yielding groundnut variety

					Black gram, Sorghum	groundnut, Castor and black gram varieties	(Dharani), Castor (YRCH-1), Black gram (VBN-8) and ICM Practices. Training on ICM and IPM in Groundnut, Castor and Black gram.
5				2019	Tapioca	Weed menace Poor returns	FLD - Intercropping system in earlier stage of crop growth in Tapioca with method demonstration and training
6				2016-17 & 2019	Sorghum Groundnut Paddy Tomato Tapioca Cabbage Beans Onion	Soil deficient in OC (69%), N (63 %), Zn (86%) & B (23%) Continuous & excess application of chemical fertilizer affected the soil fertility	FLD – Demonstration on ICM practice in Tomato with training and suitable extension activities
7				2019		Lack of information on composting & enriched poultry manure preparation	FLD- Demonstration on enriched poultry waste compost preparation with training and suitable extension activities
8				2018 & 2019	Soil & water analysis	Lack of awareness on fertility status of soil	Soil & water collection, analysis & issue of soil health cards
9				2018 & 2019	Dairy	Negative energy balance in early lactation in cross bred dairy animals	By-pass fat supplementation
10				2018	Fish waste	Lack of information on composting & enriched fish wasted and	Demonstration on enriched fish waste and seaweeds compost preparation

						seaweeds.	
11	Mohanur	Mohanur	Ganapathipal ayam	2018 & 2019	Dairy	Lack of detection of Ketosis in early lactation in cross bred dairy animals	Introduction of rapid detection kit (Ketocheck) for early detection of ketosis and feeding management practices to prevent ketosis.
12				2019	Aquaponic systems – fish culture	Large amount of sedimentation with high levels of nutrient accumulation (Nitrogen, phosphorus & organic carbon	Awareness programme on Recirculation of water. Minium water use and high yielding.

2.8. Priority/thrust areas

Crop/Enterprise	**Thrust area**
Paddy	Demonstartion of New paddy varieties (CO-52) and SRI Methods
Minor millets	Introduction of high yielding variety (Foxtail millet - Suryanandi) & Integrated crop management and value addition
Maize	Demonstration of integrated pest management practices & management modules against FAW and ICM practices
Pulses	Demonstration of high yielding pulses varieties (CO-8, VBN-6, VBN-8) with ICM practices
Groundnut	Demonstartion of high yielding varieties (Dharani & CO-7) and Integrated pest & disease management
Castor	Introduction of high yielding castor hybrids and ICM Practices
Sugarcane	Demonstartion on Sustainable Sugarcane Initiatives technology in Sugarcane and Bio intensive IPM modules
Cotton	Integrated nutrient management practice
Small onion	Demonstration on Biological methods for the management of basal rot
Tomato	Demonstration of integrated crop management practices and Pesticide residue free tomato production
Tapioca	Intercropping system
Chilli	Demonstration of Bio-intensive IPM Module
Black pepper	Integrated Disease management practice against foot rot
Hill banana	Dekmonstration of ICM practices and suitable management practices against Banana stem weevil
Mango	Management modules against leaf hopper complex
Flower + vegetables	Cropping systems
Jasmine	Timely application of fertilizers for inducing lean season and quality flowering in jasmine
Tomato	
Green fodder	Intensive fodder cultivation and seed production in fodder crops

Livestock Nutrition Management	Technology for enhancing the milk fat and SNF by supplementing sodium bicarbonate and yeast in cross-bred animals
Livestock Feed and Fodder Management	Demonstration of Mulberry leaves for better milk yield in cross bred dairy animals
Livestock Nutrition Management	Demonstration of By-pass fat supplementation for better milk yield in HF cross bred cows
Livestock Disease Management	Demonstration of rapid detection kit (Ketocheck) for ketosis in bovine
Evaluation of Breeds	Demonstrtion of performance of TANUVAS Aseel chicken under field conditions for meat purpose
Shrimp	Demonstration of Mineral Supplementation to proper moulting in shrimp and correct ionic ratio imbalances in pond water.
Pangasius fish culture	Introduction of high yielding variety and shrot culture days
Composting technology	Demonstration of suitable composting culture in waste decomposition
Composting & enrichment	Demonstration of enriched poultry waste preparation
IFS	Integrated Farming system models for various ecosystem
IFS	Sustainable ways filtering of nutrient rish fish waste in aquaculture. Ammonia are converted by denitrifying bacteria in the hydroponic grow into forms readily up taken by plant for energy and growth.

2.9. Salient Achievements of (April 2019-March, 2020) (Mandated activities/ Projects)

S.No	Activity	Target	Achievement
1.	Technologies Assessed (No.)	9	8
2.	On-farm trials conducted (No.)	55	50
3.	Frontline demonstrations conducted (No.)	29	24
4.	Farmers trained (in Lakh)	0.03650	0.07167
5.	Extension Personnel trained (No.)	500	944
6.	Participants in extension activities (in Lakh)	0.50000	0.56347
7.	Production of Seed (in Quintal)	250	283.742
8.	Planting material produced (in Lakh)	0.07000	0.10173
9.	Live-stock strains and fingerlings produced (in Lakh)	100000	10.21229
10.	Soil, Water, plant, manures samples tested (in Lakh)	0.01000	0.01131
11.	Mobile agro-advisory provided to farmers (in Lakh)	150000	1.73417
12.	No. of Soil Health Cards issued by Mini Soil Testing Kits (No.)	0.00350	0.00395
13.	No. of Soil Health Cards issued by Traditional Laboratory (No.)	0.00350	0.00395

2.10. Salient Achievements by KVK during 2019-20 (bullet points)

- Conducted cluster front line demonstration on high yielding groundnut varieties (CO-6 & Dharani) in 164 farmers field of 65.6 ha and farmers recorded higher pod (48 pods/plant) and haulm yield (3850 kg/ha) and fetched 20 percent additional income due to bold pods and good market acceptability. Also 15 farmers involved foundation groundnut seed production with PPP Mode implemented by KVK, Namakkal and Agricultural department and So far, 9550 kgs of groundnut pods received from farmers.
- Conducted cluster front line demonstration on high yielding green gram variety (CO-8) in 75 farmers field and out of 75 farmers, 26 farmers involved certified seed production (14650bkgs) with tie up of Agricultural department and KVK Salem seed hub project and obtained 36 percent more income.
- Out of total area of 3276 ha black gram area in Namakkal district, 75% area covered with VBN6 and VBN-6 variety due to continous effect of cluster front line demonstration conducted in Namakkal district during 2016-2019.
- Under PPP Mode, 56 Farmers involved fodder seed production and produced 25564.4 kgs of different fodder seeds and same distributed to the needy farmers, line departments and other institutes for Rs.11243164 during 2019-20.
- Totally 63956 farmers, entrepreneurship, rural youth, school childrens, college student, school dropouts were benefitted by different programmes conducted by KVK, Namakkal in 2019-20.
- Totally 41 special programmes conducted during 2019-20 which includes JSA Kisan Mela,Krishi Mela,Special and Important day celebrations and various exhibitions programmes. 14357 farmers benefitted by these activities.
- 283.742 Q seeds, 10173 planting materials, 11238.6 kgs of bioproducts & other inputs, 1021229 numbers of livestock , poultry chicks, fish fingerlings were produced and supplied to the 18532 farmers.
- Continued successful NICRA interventions to the other parts of the district.
- PKVY group – Masilla PKVY farmers group formed for organic farming of Pepper, Cardamom, Hill banana, Vegetables and Millets at Elangiyampatti village of Kollihills with 21 farmers covering in an area of 20 ha and the group has been approved by Regional council.
- KVK, Namakkal received Best NICRA KVK Award 2019 of the ATARI zone X during KVK Annual review workshop held at CRIDA campus, Hyderabad from 04.06.2019 to 06.6.2019
- KVK, Namakkal received Best KVK of Zone X Award "Pandit Deendayal Upadhyay Rashtriya Krishi Vigyan Protshahan Puraskar – 2018 during ICAR - 91st Foundation Day programme of ICAR at NASC, New Delhi on 16.07.2019
- KVK, Namakkal received Best Government Organization 2020 from News 18 Channel, at Coimbatore on 17.01.2020

3. TECHNICAL ACHIEVEMENTS

3.A. Details of target and achievements of mandatory activities by KVK during 2019-20

i) OFT (Technology Assessment)

Number of technologies		Total no. of Trials	
Targets	**Achievement**	**Targets**	**Achievement**
9	8	55	50

ii) FLD (crop/enterprise/CFLDs)

No of Demonstrations		Area in ha		Number of Farmers	
Targets	**Achievement**	**Targets**	**Achievement**	**Targets**	**Achievement**
29	24	202.3	166.5	630	536

iii) Training (including sponsored, vocational and other trainings carried under Rainwater Harvesting Unit)

Number of Courses			Number of Participants	
Clientele	**Targets**	**Achievement**	**Targets**	**Achievement**
Farmers	100	103	2000	2826
Rural youth	10	17	400	557
Extn. Functionaries	15	22	500	944
Sponsored	15	25	700	1146
Vocational	2	4	50	100
Other trainings under Rainwater harvesting	5	27	500	2538

iv) Extension Activities

Number of activities		Number of participants	
Targets	**Achievement**	**Targets**	**Achievement**
500	529	50000	56347

v) Seed Production (q)

Target	Achievement	Distributed to no. of farmers
250	283.742	14734

vi) Planting material (Nos.)

Target	Achievement	Distributed to no. of farmers
7000	10173	1331

v) Livestock and Fisheries (Nos.)

Target	Achievement	Distributed to no. of farmers
100000	1021229	438

vii) Bio inputs (Nos.)

Target	Achievement	Distributed to no. of farmers
8000	11238.6	2029

3.B. TECHNOLOGY ASSESSMENT

i) Summary of technologies assessed under various crops by KVKs

Thematic areas	Crop	Name of the technology assessed	Source of technology with year	No. of trials	No. of farmers
Integrated Nutrient Management	Jasmine	Assessment of timely application of fertilizers to induce lean season & quality flowering	IIHR, Bengaluru, 2012 & TNAU,CBE 2013	10	10
	Cotton	Assessment of nutrient management practice for cotton	CICR, Coimbatore, 2016 TNAU, Coimbatore, 2012	5	5
Varietal Evaluation	Foxtail Millet	Assessment of Foxtail Millet variety under rainfed condition in Namakkal district	ANGRAU, 2012	5	5
Integrated Pest Management	Maize	Assessment of management modules against Fall Army Worm in Maize	ATARI, Hyderabad, 2018	5	5
	Mango	Assessment of Management modules against leaf hopper complex in Mango	TNAU,2016 & IIHR,2017	10	10
	Banana	Assessment of Suitable management practices against Banana Stem weevil in kolli hills	NRCB , TNAU &CTCRI,2015	5	5
Integrated Disease Management	Black pepper	Assessment of suitable control measure against foot rot in black pepper in Kollihills	TNAU,CBE & IISR,Calicut, 2017	5	5
Others (Pl. specify) Cropping system	Chrysanthemum Small onion and Chilli	Assessment of vegetable + flower based intercropping system in Namakkal District	UAS, Dharwad & DOGR, Pune 2013	5	5
Total				**50**	**50**

ii) 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
Nutrition Management	Dairy animals	Assessing the Technolgy for enhancing the milk fat and SNF by supplementing sodium bicarbonate and yeast in cross-bred animals	5	5
Total			**5**	**5**

3.C. TECHNOLOGY ASSESSMENT IN DETAIL

OFT- 1 (INM)

1. **Thematic area:** Nutrient Management
2. **Title:** Assessment of timely application of fertilizers to induce lean season and quality flowering in jasmine
3. **Scientists involved**: Dr.S.Sathya, Assistant Professor (Soil Science) & Senior Scientist & Head
4. **Details of farming situation**:

- **Area of Demonstration**

  On Farm Testing on "Assessment of timely application of fertilizers to induce lean season and quality flowering in jasmine" was carried out in ten farmers' field in an area of 1.2 ha in Vadugapatti village, Erumapatti block Namakkal District during Rabi season 2018 - 19. Vadugapatti village is situated at 11.080 N latitude and 078.140 E longitude wit mean sea level of 139 MSL.

- **Crops grown**

  Jasmine, Groundnut, sorghum, maize, small onion, pulses, coconut are the major crops grown in Vadugapatti village to an area 109 ha under irrigated and rainfed condition. Jasmine is the main crop; farmers are getting year round income on daily basis. They are doing pruning process from November to January based on the availability of water and yielding potential of jasmine.

- **Season**

  The main cropping systems followed by the farmers are jasmine/Jasmine/Jasmine and Groundnut/pulses/maize/sorghum are the major cropping system followed in Kharif, Rabi & summer season at Ganapathipalayam village.

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

  Bore well and well is the main source of irrigation. 15 % of the farmers used drip irrigation whereas 85 % of the farmers followed flood irrigation to irrigate jasmine.

- **Soil type and fertility status**

  The experimental soil type was black in colour, sandy loam in texture and calcareous to non calcareous. The soil was neutral in soil reaction (7.68), non saline (0.048 dS m^{-1}), low in organic carbon (0.41%), low in available nitrogen (222 kg ha^{-1}), medium in available phosphorus (18.42 kg ha^{-1}), medium in available potassium (148 kg ha^{-1}), medium in available sulphur (12.10 ppm), deficient in available zinc (0.78 ppm) and boron (0.35 ppm).

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

  The annual rainfall of Erumapatti block was 312 mm with 28 rainy days. Of which, experimental season received received was November 2018 to May 2019, average rainfall of 135.9 mm with 17 rainy days. Maximum monthly mean temperature was 30.6^{o}C and minimum was 19.5^{o}C.

5. **Problem definition / description**:
   - ✓ Unaware about timely fertilizer application
   - ✓ Lack of balanced fertilization
   - ✓ Reduction in yield of crops
6. **Technology Assessed**:

TO1	Farmers practice	Application of complex fertilizer (17:17:17) and Muriate of potash – each @ 50 g /tree as basal dose

TO2	Recommended practice (Source: TNAU, Coimbatore, 2013)	Recommended practice (NPK @ 60:120:120 g/plant/year is applied in 2 equal splits during November (after pruning) and June-July along with 10 kg FYM per plant. (urea – 130 g, SSP – 750 g & MOP- 200 g) Biofertilizers: Azospirillum ,Phosphobacteria , VAM each @ 50 g / plant Foliar spraying of panchakaviyam (3%), humic acid spray (0.40 %), zinc sulphate (0.25%), Magnesium sulphate (0.50%) and iron sulphate (0.50%) at monthly intervals
TO3	Alternate practice (Source: IIHR, Bangalore, 2016)	Recommended practice (NPK @ 60:120:120 g/plant/year is applied in 4 equal splits during February, May, September and December along with 10 kg FYM per plant. Biofertilizers : Azospirillum, Phosphobacteria , VAM each @ 50 g / plant. Oil cake (neem or groundnut cake) @100 g /tree & Zinc sulphate (0.25%), Magnesium sulphate (0.50%) and iron sulphate (0.50)

7. **Critical inputs given:**

S.No.	Name	Qty (kg /litre)	Unit cost (Rs.)	Total cost (Rs.)
1.	Azospirillum	1 kg	55	55
2.	Phosphobacteria	1 kg	55	55
3.	Zinc sulphate	3 kg	149.86	149.86
4.	Borax	3 kg	255.02	255.02
5.	Ferrous sulphate	3 kg	59.98	59.98
6.	Copper sulphate	3 kg	599.76	599.76

8. Results: Trail is under progress

Table : 1. Performance of the technology

Technology Option	***No. of trials***	***Yield (q/ha)***	***Gross cost (Rs.in Lakhs)***	***Net Return (Rs .in Lakhs)***	***B:C ratio***	***1000 flowers weight (g)***	***Flower yield / plant (g)***
Farmers Practice	*10*	71.0	2.455	4.644	2.89	157.8	26.54
Technology Option 1 TNAU practice		82.0	2.559	5.640	3.20	189.5	50.21
Technology Option 2 IIHR practice		73.8	2.461	4.918	3.00	176.5	43.43

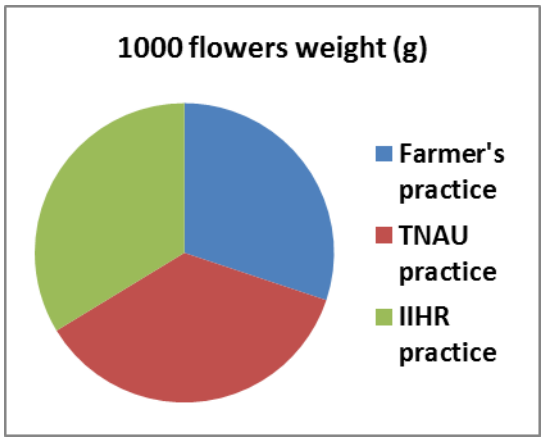
Table 2. Soil nutrient status

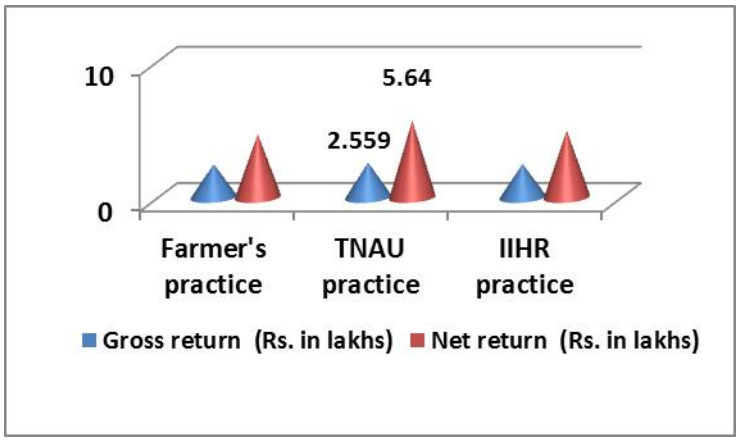
Parameters	Initial soil test value	Post harvest soil test values		
		Farmers practice	TNAU recommendation	IIHR recommendation
Soil reaction	7.65	7.54	7.43	7.32
Electrical Conductivity (dS m^{-1})	0.095	0.101	0.056	0.078
Organic carbon (%)	0.56	0.58	0.59	0.59
Available nitrogen (kg ha^{-1})	267	275	269	267
Available phosphorus (kg ha^{-1})	35.67	36.78	36.89	35.67
Available potassium (kg kg^{-1})	231	243	256	259
Available sulphur (mg kg^{-1})	16.73	17.65	17.89	17.73

Available zinc (mg kg^{-1})	0.98	1.03	0.98	0.89
Available boron (mg kg^{-1})	0.43	0.44	0.43	046

Description of the results

- ✓ The on farm trials were conducted in ten farmer's field at Vadugapatti village during Rabi season 2018.
- ✓ Application of fertilizers in 2 equal splits during November (After pruning) and june, biofertilizers application @ 20 g/tree & folair spraying of panchakaviyam (3%), humic acid spray (0.40 %), zinc sulphate (0.25%), Magnesium sulphate (0.50%) and iron sulphate (0.50%) recorded highest flower yield of 82 q/ha with heist net return of Rs.564028 with BC ratio of 3.20.
- ✓ 1000 flowers weight (189.5 g) and flower yield / plant (50.21 g) also recorded high in TNAU practice followed by IIHR and farmers practice.
- ✓ With regard to soil available nutrient status, available nutrients were quite high compared to initial value in all three practices.





Constraints faced:

Irregular rainfall caused the deviation in pruning of unwanted twigs in jasmine.

9. Feed back of the farmers involved:

Split application of NPK nutrients along with foliar spraying of micronutrients and bio agents recorded the higher 1000 flowers weight of 189.5 g, flower yield/plant 50.21 g , flower yield 82 q/ha with BC ratio of 3.2 than other practices. Normally, farmers applying fertilizers in six times with two months interval after the picking of flowers. Hence farmers felt that they can save Rs. 5,500/- ha by two splits application of fertilizers as per soil test values.

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

Technology may be developed to increase the quality of flowers in off season and irregular rainfall pattern. Soil application dose of micronutrients may be developed to control the nutrient deficient in middle stage of flowering especially pink and small size bud.

OFT-2 (INM)

1. Thematic area: Nutrient Management

2. Title: Assessment of Nutrient management practice in cotton

3. **Scientists involved**: Dr.S.Sathya, Assistant Professor (Soil Science) & Dr.N.Akila Senior Scientist & Head

4. **Details of farming situation**:

- **Area of Demonstration**

  On Farm Testing on "Assessment of nutrient management practice in cotton was carried out in five farmers' field in an area of 2 ha in Manuvakkattupalayam village, Mallasamuthiram block Namakkal District during Summer season 2020 (Late rabi season). Manuvakkattupalayam is situated at 11.28 N latitude and 078.01 E longitude wit mean sea level of 139 MSL.

- **Crops grown**

  Groundnut, sorghum, pulses, coconut, vegetable, cotton, sugarcane are the major crops grown in Manuvakattupalayam village to an area 512 ha under irrigated and rainfed condition. Cottton is the main crop and farmers are cultivating in both rabi and summer season for getting income. Farmers preference in season may getting varied based on the water availability in borewell as well as in well.

- **Season**

  The main cropping systems followed by the farmers are Groundnut/Sorghum/cotton and Cotton/Pulses/sorghum/vegetables are the major cropping system followed in Kharif, Rabi & summer season at Manuvakattupalayam village.

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

  Bore well and well is the main source of irrigation. 15 % of the farmers used drip irrigation whereas 85 % of the farmers followed flood irrigation to irrigate cotton.

- **Soil type and fertility status**

  The experimental soil type was black in colour, sandy loam in texture and calcareous to non calcareous. The soil was neutral in soil reaction (7.68), non saline (0.028 dS m^{-1}), low in organic carbon (0.49%), low in available nitrogen (234 kg ha^{-1}), medium in available phosphorus (19.89 kg ha^{-1}), medium in available potassium (167 kg ha^{-1}), medium in available sulphur (10.780 ppm), deficient in available zinc (0.90 ppm) and boron (0.37 ppm).

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

  The annual rainfall of Mallasamuthiram was 397 mm with 23 rainy days. Of which, experimental season is March 2020 to July 2020. Maximum monthly mean temperature was 32.5^{o}C and minimum was 24.3^{o}C.

5. Problem definition / description:

- ✓ Unaware intercropping with sunnhemp
- ✓ Lack of balanced fertilization
- ✓ Reduction in yield of crops

6. Technology Assessed:

TO1	Farmers practice	**TO1-** Application of complex fertilizer (17:17:17) @ 50 kg /acre as basal dose, & urea and Muriate of potash each @ 50 kg /acre @ 45 DAP
TO2	Recommended practice (Source: TNAU, Coimbatore, 2012)	Recommended practice (**TO2-** Recommended practice (FYM @ 12.5 t/ha + Biofertilizers @ 2 kg/ha +100% RDF + Mn mixture @15 kg/ha)
TO3	Alternate practice (Source: CICR, 2016)	Recommended practice Recommended practice (FYM @ 5 t /ha & Sunnhemp @ 15kg/ha raised & insitu incorporated in burrows + Biofertilizers @ 2 kg/ha +100% RDF + Mn mixture @15 kg/ha)

7. Critical inputs given:

S.No.	Name	Qty (kg /litre)	Unit cost (Rs.)	Total cost (Rs.)

1.	Azospirillum	1 kg	55.00	55.00
2.	Phosphobacteria	1 kg	55.00	55.00
3.	Green manure seeds	3 kg	75.00	225.00
4.	Cotton plus	2.5 kg	250.00	625.00
5.	Cotton MN mixture	5 kg	80.00	400.00

8. Results: Trail is under progress

OFT -3 (Varietal Evaluation)

1. **Thematic area**: Varietal Evaluation
2. **Title:** Assessment of Foxtail Millet variety under rainfed condition in Namakkal district
3. **Scientists involved**: Dr.P.Murugan, Scientist (Agronomy) & Dr.N.Akila, Senior Scientist & Head
4. **Details of farming situation**

- **Location of trial**

Foxtail millet is an important minor millets crop, cultivated in Namagiripettai, Rasipuram, Mallasamudhiram and Kollihills blocks of Namakkal district in an area of 105 ha during Kharif season of every year. Most of the marginal farmers in the blocks are cultivating foxtail millet as pure crop under rainfed condition for their livelihoods. The Farmers are contionously cultivating traditional local varieties and obtaining low grain yield (650 kgs/ha) under rainfed condition. Further scope for enhancing yield is limited due to non adoption of high yielding varieties and ICM practices. Hence, KVK Namakkal conducted On Farm trial on Assessment of Foxtail Millet variety under rainfed condition in Namakkal district at five farmers field of Karkoodalpatti villages of Namagiripettai block during Kharif season. Karkoodalpatti village is situated at 11.50^0 N latitude and 78.35^0 E longitude.

- **Major crops grown**

Karkoodalpatti – Millets, Maize, Groundnut, Black gram, vegetables, Tapioca

- **Season**

The main cropping systems followed by the farmers are Groundnut – Maize, Millets – Black gram, Vegetables - Maize and Tapioca followed by minor millets. Main season for foxtail millet cultivation in Namagiripettai block is August - November (Kharif season).

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

Fifty per cent of the area in Namagiripettai block is under rainfed condition. Minor millets growing farmers are cultivating foxtail millet under rainfed condition. If water source is available, crop suffer from moisture deficit, they could irrigate the field.

- **Climatic condition during the crop period**

The average annual rainfall of Namakkal District in 2018-19 was 990.9 mm. Out of which, the rainfall received during South West Monsoon is 485.0 mm. Karkoodalpatti village received an average rainfall of 98.8 mm with 8 rainy days in August, 222.6 mm of rainfall in 11 rainy days during September, 219.6 mm of rainfall in 12 rainy days during Octobert and 94.8 mm of rainfall in 6 rainy days in November 2019. During the crop period (August 2019 – November 2019) totally 635 mm of rainfall was received in 37 rainy days. Maximum monthly mean temperature was 32.3^oC and minimum was 23.6^oC.

- **Soil type and fertility status**

The soil type is red sandy loam with a pH of 7.65 and EC of 0.8 dSm^{-1} with a soil nutrient status of low Nitrogen (225 kg/ ha), medium Phosphorus (11.4 kg / ha) and high Potassium (365 kg /ha).

5. Problem definition / discription

- Farmers cultivate traditional local foxtail millet variety under rainfed condition and some places as a mixed crop with black gram in Namakkal district.
- The incidence of blast diseases and lodging is a severe problem in local variety and results in poor yield.
- Non adoption of improved crop management practices in foxtail millet cultivation.
- Low yield in existing variety (550 – 650 kg/ha)
- Crop failure during drought due to long duration
- Less farm income.
- Farmers expected high yielding and short duration foxtail millet variety suitable for rainfed condition.
- The main objective of the study was to assess the performance of high yielding and short duration foxtail millet variety suitable for rainfed condition in Namakkal district.

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

Technological Options		Technology details
TO 1	Farmers practice	**Cultivation of local traditional foxtail millet variety (Farmers Practice)**- Low yield, Lodging and Long duration (120 days), Incidence of pest and diseases, Less straw yield, it's a traditional variety owned by Kollihills region of Namakkal district.
TO2	Recommended practice (Source: TNAU,CBE, 2005)	**Cultivation of foxtail millet variety (Co(Te)-7)** - Short duration -90 days, Bold grains, Resistant to Lodging, Tolerant to leaf blast & rust, High protein – 13.62%,High yield (1855kg/ha), suitable for Tamil Nadu.
TO3	Alternate practice (Source: RARS, ANGRAU, Nandyal, 2012)	**Cultivation of foxtail millet variety (Suryanandi (SiA 3088))**- Short duration (70-75 Days), Early maturity, Resistant to lodging, Tolerant to drought, Suitable for double cropping, Suitable for all over India, Higher grain yield (2100 - 2500 kg/ha).

7. Critical inputs given: (along with quantity as well as value)

Name of the critical inputs	*Quantity (kgs)*	*Cost (Rs.)*
Foxtail millet variety (Co(Te)-7)	5 kg	1875
Foxtail millet variety (Suryanandi (SiA 3088))	5 kg	1875
Pseudomonas for seed treatment	1 kg	750
Soil application of Azospirillum	1 kg	250
Foliar spray of PPFM	1 litre	2000
Millet Micronutrient Mixture	5 no.	2500

8. Results:

Table: 1. Performance of the technology

Technology Option	***No.of trials***	***Yield (Q/ha)***	***Net Returns (Rs.in***	***B:C ratio***	***Panicle length (cm)***	***No. of tiller per plant***

			Lakhs)			***(No)***
Farmers Practice (Local traditional foxtail millet variety)	*5*	7.25	0.127	1.78	12.40	4.5
Technology Option 1 (Foxtail millet variety (Co(Te)-7)		12.55	0.320	2.75	17.10	6.9
Technology Option 2 Foxtail millet variety (Suryanandi (SiA 3088))		13.85	0.369	2.99	17.20	7.1

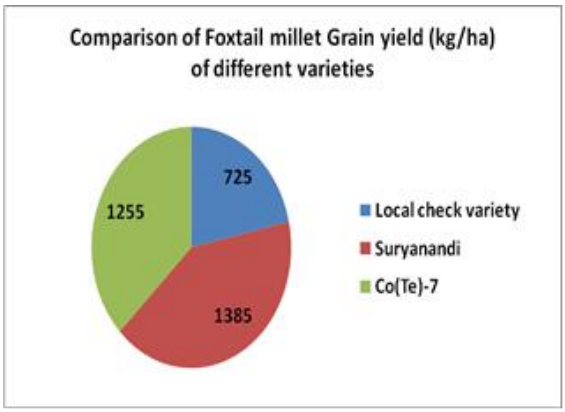
Description of the results

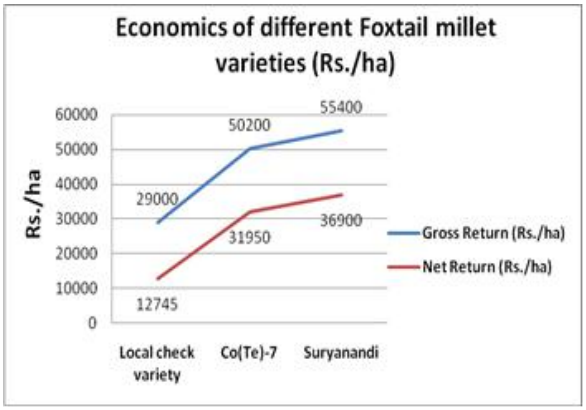
- ✓ The on farm trials were conducted in five farmers field at Karkoodalpatti village during Kharif season 2019. KVK offered off campus training, distributed critical inputs to the beneficiaries and trials were carried out. The yield data recorded in OFT fields under different foxtail millet variety along with farmers local variety. The average yield and yield parameters recorded in the field are mentioned below.

Table 2. Other Parameters observed

Parameters	***Local traditional foxtail millet variety (FP)***	***Foxtail millet variety (Co(Te)-7)***	***Foxtail millet variety (Suryanandi (SiA 3088)***
Germination percentage	86.2	90.3	90.1
Plant height (cm)	88.4	105.3	114.2
Plant population (No/sq.m)	27.2	30.4	30.2
No. of tiller per plant	4.5	6.9	7.1
Panicle length (cm)	12.40	17.10	17.20
Blast incidence (%)	6.22	2.20	2.31
Grain yield (tons/ha)	725.0	1255.0	1385.0
Straw yield (kg/ha)	3755.0	4215.0	4325.0
Gross cost Rs. /ha	16255	18250	18500
Gross return Rs. /ha	29000	50200	55400
Net return Rs. /ha	12745	31950	36900
BCR	1.78	2.75	2.99

- ✓ On farm trial results revealed that cultivation of Foxtail millet variety (Suryanandi (SiA 3088) with integrated crop management practices recorded more number of productive tillers per plant (7.1), more panicle length (17.20 cm), higher plant population (30.2 nos/sq.m), more plant height (114.2 cm) , less incidence of blast disease (2.31%), higher grain yield (1385 kg/ha), higher straw yield (4325 kg/ha) as compared to other foxtail millet variety (***Co(Te)-7***) and farmer practice.
- ✓ With regard to TNAU variety (Co(Te)-7) recorded more number of productive tillers per plant (6.9), more panicle length (17.10 cm), higher plant population (30.4 nos/sq.m), more plant height (105.3 cm) , less incidence of blast disease (2.20%), higher grain yield (1255 kg/ha), higher straw yield (4215 kg/ha) as compared to farmer practice and It is on par with Suryanandi (SiA 3088) variety**.**
- ✓ The least grain yield (725 kg/ha) and higher incidence of blast disease (6.22 %) were observed in local check variety.





- ✓ Economics of the study revealed that cultivation of Suryanandi (SiA 3088) variety with integrated crop management practices registered higher net returns (Rs.36900/ha) and benefit cost ratio (2.99) followed by Co(Te)-7 variety.
- ✓ Fetched higher market price (Rs.40/kg) for all foxtail millet variety compared to other minor millets crop and most of the farmers were accepted for preference for Suryanandi (SiA 3088) and Co(Te)-7 variety.
- ✓ The study showed that cultivation of Suryanandi (SiA 3088) and Co(Te)-7 foxtail millet variety under rainfed condition responded well in terms of yield attributes, grain yield and higher net returns.

Constraints faced:

No constraints faced by the farmers for cultivation of Suryanandi (SiA 3088) and Co(Te)-7 foxtail millet variety. But Cultivation of local farmer's variety affected by blast diseases and resulted less yield. All the varieties damaged by peacock during maturity stage. Separate labour required to protect the foxtail millet panicles during maturity period.

9. Feedback of the farmers involved:

Cultivation of Suryanandi (SiA 3088) and Co(Te)-7 foxtail millet varieties recorded more number of productive tillers per plant, more panicle length, higher plant population, more plant height, less incidence of blast disease, higher grain yield, higher straw yield under rainfed condition. Very less incidence of blast diseases was observed in the both varieties and also fetched good market price for all varieties. Many farmers were accepted to cultivate Suryanandi (SiA 3088) and Co(Te)-7 foxtail millet varieties under rainfed due to less cost of cultivation, easy management but more number of labours required to protect the matured crop from peacock.

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

Suryanandi (SiA 3088) and Co(Te)-7 foxtail millet varieties performed well in Namakkal district and it was to informed to concerned institutes.

OFT-4 (IPM)

1. **Thematic area:** Integrated Pest Management
2. **Title:** Assessment of management modules against Fall Army Worm in Maize
3. **Scientists involved**: Dr.K.R. Pushpanathan, Assistant Professor (Agronomy) & Dr.N.Akila, Senior Scientist & Head
4. **Details of farming situation**:

   - ❖ **Area of Demonstration**

     On Farm Testing on "Assessment of management modules against Fall Army Worm in Maize to control the incidence of fall army worm (Spopdptera frugiperda) from vegetative phase to cob maturity phase for increasing grain yield" was carried out in fivefarmers' field

in an area of 2.0 ha in Thattaiyengarpatty village, Puthuchattiram block, Namakkal District during Kharif season 2019 - 20. Thattaiyengarpatty village is situated at 11.380 N latitude and 78.160 E longitude wit mean sea level of 142 MSL.

- **Crops grown**

  Maize, Groundnut, sorghum, tapioca, pulses, coconut are the major crops grown in Thattaiyengarpatty village to an area 122 ha under irrigated and rainfed condition. Maize is the main crop; followed by pulses/sorghum/ tapioca. They are cultivating maize by utilizing borewell water under drip irrigation system followed by pulses or tapioca, November to January based on the availability of water.

- **Season**

  The main cropping systems followed by the farmers are Maize-Groundnut / Pulse- Sorghum are the major cropping system followed in Kharif, Rabi & summer season at Thattaiyengarpatty village.

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

  Bore well and well is the main source of irrigation. 45 % of the farmers used drip irrigation whereas 55 % of the farmers followed flood irrigation to irrigate Maize crop.

- **Soil type and fertility status**

  The experimental soil type was black in colour, sandy clay loam and sandy loam in texture and calcareous to non calcareous. The soil was neutral in soil reaction (7.84), non saline (0.052dS m^{-1}), low in organic carbon (0.52%), low in available nitrogen (212 kg ha^{-1}), medium in available phosphorus (16.42 kg ha^{-1}), medium in available potassium (144 kg ha^{-1}).

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

  The annual rainfall of Puthuchatiram block was 509.3 mm with 57 rainy days. Of which, experimental season was September 2019 to December 2019, received average rainfall of 363.6 mm with 31 rainy days. Maximum monthly mean temperature was 31.6^{o}C and minimum was 21.8^{o}C.

5. Problem definition / description:

- Yield reduction due to Fall Army Worm (*Spodoptera frugiperda*) incidence

6. Technology Assessed:

TO1	Recommended practice **(Source: ATARI, Hyderabad 2019)**	➢ Summer ploughing ➢ Seed treatment with Fortenza duo (Cyantranniliprole + Thiamethoxam) @ 4 ml/ kg . ➢ Collection and destruction of egg masses ➢ *S. frugiperda pheramone traps* @ 4 no./ acre. ➢ Border crop with grain sorghum+ intercrop with cowpea (few rows). ➢ Azardiractin10000 ppm @ 2ml/ lit. (10 to 15 DAS) ➢ Application of entomophylic nematode (EPN) or BT spray @ 2ml/lit (15 to 21 DAS ➢ First insecticide sprays -Emamectin benzoate 5SG @0.4g/ lit. (or) Spinosad 480SC @ 0.5 ml/lit. (21- 28 DAS)

		➢ Mearhizium anisopliae spray (1X107) @2 ml/ lit (30-35 DAS). ➢ Second insecticide spray -Chlorontriliniprole 18.5 SC @0.3 ml/ lit. (36-42 DAS) ➢ Poison baiting 45-65 DAS using Thiodiocarb 75WP (ICAR-IIMR, Ludhiana)
TO2	Farmers practice	Spraying of insecticide – after noticing the FAW incidence

7. Critical inputs given:

S.No.	Name	Qty (kg /litre)	Unit cost (Rs.)	Total cost (Rs.)
1.	Fortenza duo	0.04 litre	200	200
2.	*S. frugiperda pheramone traps*	4 Nos	85	340
3.	Border crop with grain sorghum+ intercrop with cowpea	1.0 kg	50	50
4.	Azardiractin10000 ppm/ Neem Oil 5ml/ litre	0.5 litre	200	200
5.	Emamectin benzoate 5SG	0.6 litre	450	450
6.	Mearhizium anisopliae spray (1X107)	2.0 kg	600	600
7.	Insecticide spray - Chlorontriliniprole 18.5 SC (Coragen)	0.6 litre	490	490

8. Results:

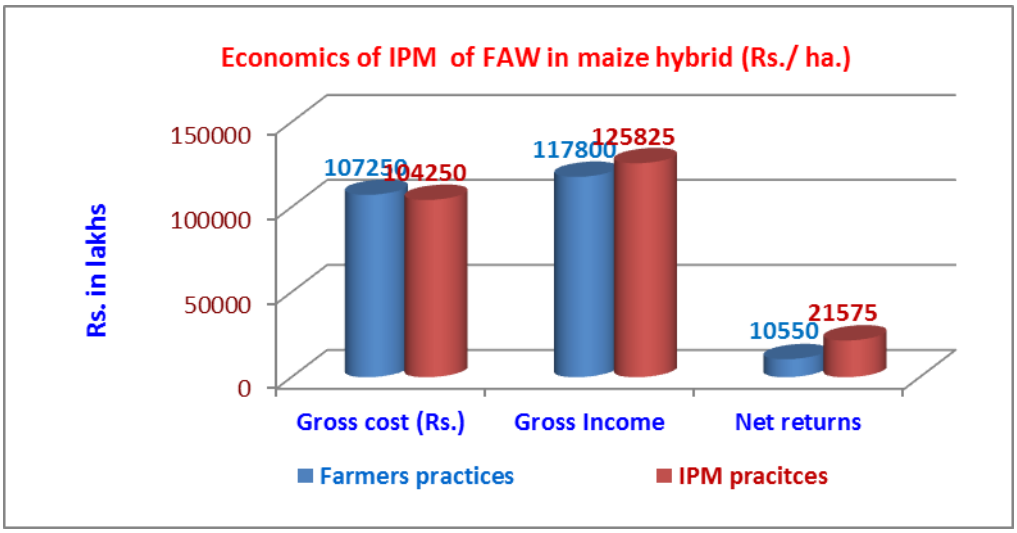
Table 1: Performance of the technology

Technology Option	***No.of trials***	***Yield (q/ha)***	***Gross cost (Rs.in Lakhs)***	***Net (Rs.in Lakhs)***	***B:C ratio***
Technology Option 1 Summer ploughing, Seed treatment with Fortenza duo, *S. frugiperda pheramone traps,* border crop with grain sorghum+ intercrop with cowpea, Azardiractin10000 ppm/ Neem Oil 5ml/ litre on 14 DAS, Emamectin benzoate 5SG @0.4g/ lit. on 22 DAS, Mearhizium anisopliae spray (1X107) @2 ml/ lit. On 33 DAS., and Insecticide spray -Chlorontriliniprole 18.5 SC @0.3 ml/ lit .on 44 DAS	*5*	64.25	1.043	0.217	1.21
Farmers Practice		62.0	1.072	0.106	1.11

Table 2. Other Parameters observed

Parameters	**Farmers practices**	**Technology 1 (IPM practices of Maize hybrid)**

First incidence of Fall army worm larvae (Days after sowing)	11	17
Damage percentage (%)	11.4	7.2
No.of Adult moth trapped / Pheromone trap	0	1.32
Natural enemies occurrence (No/Sq.m^2)	2.6	3.2
Grain yield (Q/ha)	62	64.25
Gross cost Rs. /ha	107250	104250
Gross return Rs. /ha	117800	125825
Net return Rs. /ha	10550	21575
BCR	1.11	1.21



Description of the results

- ✓ The on farm trial was conducted in ten farmer's field at Thattaiyengarpatty village during Kharif season 2019.
- ✓ Summer ploughing, Seed treatment with Fortenza duo, *S. frugiperda pheramone traps,* border crop with grain sorghum+ intercrop with cowpea, Azardiractin10000 ppm/ Neem Oil 5ml/ litre on 14 DAS, Emamectin benzoate 5SG @0.4g/ lit. on 22 DAS, Mearhizium anisopliae spray (1X107) @2 ml/ lit. On 33 DAS., and Insecticide spray -Chlorontriliniprole 18.5 SC @0.3 ml/ lit .on 44 DAS controlled the incidence of fall army worm in maize with *highest grain yield of 64.25 q/ha with net return of Rs.*21575 with BC ratio of 1.21.

Constraints faced:

- ➢ Crops at 45 days duration, spraying is difficult and also labour cost for spraying is higher.
- ➢ If rains occurred during spraying time, efficiency is less and FAW incidence is not controlled.
- ➢ Mechanised harvesting is needed to reduce the expenditure. Price for the maize grain has been decreased and net income was very low

9. Feed back of the farmers involved:

- ➢ Labour is not available in time for spraying pesticide causes severe damage.
- ➢ Higher expenditure for pesticide application noticed.

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

- ➢ Seed treatment with Fortenza duo, followed by raising border crop with grain sorghum and cow pea inter crop, installation of *Spodoptera frugiperda* trap, need based application of pesticide, nee oil, bio –pesticide in time effectively controlled the pest and yield reduction due

to pest is reduced and grian yield is obtained with minimum loss. The recommendation given was found to be concerned institutions.

OFT- 5 (IPM)

1. **Thematic area:** Integrated Pest Management
2. **Title**: Assessment of Management modules against leaf hopper complex in Mango
3. **Scientists involved**: Dr.K.R. Pushpanathan, Assistant Professor (Agronomy) &Dr.N.Akila, Senior Scientist & Head
4. **Details of farming situation**:

- **Area of Demonstration**
  On Farm Testing on "**Assessment of Management modules against leaf hopper complex in Mango** was carried out in ten farmers' field in an area of 3.0 ha in Chinnapallamparai village, Senthamangalam block Namakkal District during Rabi season 2019. Chinnapallamparai is situated at 11.42 N latitude and 078.01 E longitude wit mean sea level of 147 MSL.
- **Crops grown**
  Mango is the major crops grown in Chinnapalamparai village to an area 512 ha under irrigated and rainfed condition. Mango is the main crop and farmers are cultivated as mono cropping for getting income. Farmers preference in season may getting varied based on the water availability in borewell as well as in well.
- **Season**
  The main cropping systems followed by the farmers are Mango mono crop as the major cropping system in Kharif season at Chinnapallamparai village.
- **Farming situation (Rainfed/Irrigated) – Rainfed with Irrigated condition**
  Rain fed based crop is 65 per cent, Bore well and well is the main source of irrigation. 35 % of the farmers used drip irrigation whereas 65 % of the farmers followed drip irrigation to irrigate mango crop.
- **Soil type and fertility status**
  The experimental soil type was black in colour, red and black in texture and calcareous to non calcareous. The soil was neutral in soil reaction (7.68), non saline (0.028 dS m^{-1}), low in organic carbon (0.49%), low in available nitrogen (234 kg ha^{-1}), medium in available phosphorus (19.89 kg ha^{-1}), medium in available potassium (167 kg ha^{-1}), medium in available sulphur (10.780 ppm), deficient in available zinc (0.90 ppm) and boron (0.37 ppm).
- **Weather and climate during the study period**
  The annual rainfall of Chinnapallamparai was 945 mm with 31 rainy days, Maximum monthly mean temperature was 31.6^{o}C and minimum was 21.4^{o}C.

5.Problem definition / description:

- Suck the sap of tender parts and reducing vigour of plants
- Shedding of flower buds and flowers (35%)
- Destroying the inflorescences and causing fruit drop.(15%)
- Curling and drying of infested tissue
- Development of sooty mould (60%)
- Poor yield (150 no fruits/ tree)
- Heavy dose spraying insecticide (50ml)

6.Technology Assessed:

TO1	Recommended practice **(Source: IIHR, 2017)**	Spraying of oil based *Metarhizium anisopliae* @ 1ml/ lit of water at 3 times for weekly intervals Setting up of Yellow sticky trap @ 25/ha

TO2	Alternate practice **(Source: TNAU, 2016)**	Neem oil @ 5ml/lt or Nimbicidine 1500ppm @ 4ml/lt Setting up of Yellow sticky trap @ 25/ha
TO3	Farmers practice	Spraying of combination of insecticides of local available chemical @ 60ml/lit

7.Critical inputs given:

S.No.	Name	Qty (kg /litre)	Unit cost (Rs.)	Total cost (Rs.)
1.	Metarhizium anisophilae	0.400 litre	200	200
2.	Yellow sticky trap	5 Nos	55	275
3.	Neem Oil	0.250 litre	100	100
4.	Yellow sticky trap	5 nos	55	275

8. Results:

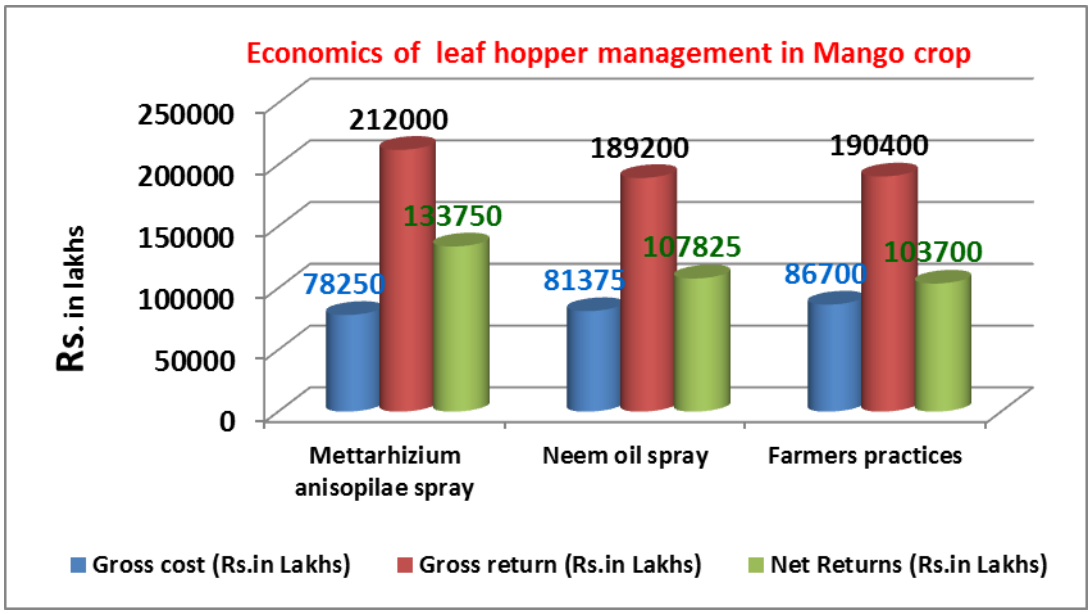
Table : Performance of the technology

Technology Option	***No.of trials***	***Yield (q/ha)***	***Gross cost (Rs.in Lakhs)***	***Net (Rs.in Lakhs)***	***B:C ratio***
Technology Option 1 Spraying of oil based *Metarhizium anisopliae* @ 1ml/ lit of water at 3 times for weekly intervals Setting up of Yellow sticky trap @ 25/ha	10	106	0.783	1.337	1:2.71
Technology Option 2 Neem oil @ 5ml/lt or Nimbicidine 1500ppm @ 4ml/lt Setting up of Yellow sticky trap @ 25/ha		94.5	0.814	1.078	1:2.33
Farmers Practice - Spraying of combination of insecticides of local available chemical @ 60ml/lit.		95.2	0.867	1.037	1:2.2

Table 2. Other Parameters observed

Parameters	**Technology 1 (Oil based *Mettarhizum anisophilae spray*)**	**Technology 1 (Oil based Neem oil spray)**	**Farmers practices (Insecticide spray)**
Number of hoppers/ panicles in a single branch of the tree at 15 days before spray	46.4	45.8	44.6
Number of hoppers/ panicles in a single branch of the tree at 15 days after spray	3.4	4.4	5.2
Number of young fruit dropped/ tree (30 yrs old tree)	8.6	9.5	11.4
Number fruits harvested/ tree	1402	1278	1146
No. of moths trapped in a single yellow sticky trap	5.8	6.4	0
Yield (Q/ha)	106	94.5	95.2
Gross cost Rs. /ha	78250	81375	86700
Gross return Rs. /ha	212000	189200	190400

Net return Rs. /ha	133750	107825	103700
BCR	1:2.71	1:2.33	1:2.2



Description of the results

- ✓ The on farm trials were conducted in ten farmer's field at Chinnapalamparai village during Rabi season 2019. Summer ploughing, manure and fertilizer were applied. During flowering stage, spraying of oil based *Metarhizium anisopliae* @ 1ml/ lit of water at 3 times for weekly intervals from October 2019 to Decemebr 2019 at 20days intervals effectively controls the pest incidence and increase the yield of crop.
- ✓ Setting up of Yellow sticky trap @ 25/ha in mango crop controlled the sucking pest. Application of bio- pesticide recorded with highest fruit yield of 106 q/ha with net return of Rs.133750 with BC ratio of 2.71.

Constraints faced:

Sometimes fruit bearing is very less due to varied climatic conditions.Expenditure towards pest and disease control is higher for spraying.

Heavy wind incidence is noticed during fruit bearing period dropping of fruit occurred and cause heavy loss.

9. Feed back of the farmers involved:

- ➢ Market rate for fruits is very less
- ➢ Fruit dropping was reduced and pest incidence was controlled by bio-pesticide application..
- ➢ Five to six times on spraying with chemical pesticide was normally done, whereas with bio pesticide it was reduced to three times.

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

- Application of oil based *Metarhizium anisophilae* was found to be effective in controlling the leaf hopper of mango and farmers were realized on it. The recommendation was founds to be followed for coming year practices.

OFT-6 (IPM)

1. Thematic area: Integrated Pest Management

2. Title: Assessment of suitable management practices against Banana stem weevil in Kolli hills

3. Scientists involved: Dr.K.R. Pushpanathan, Assistant Professor (Agronomy) & Dr.N.Akila Senior Scientist & Head

4. **Details of farming situation**:

- **Area of Demonstration**

  On Farm Testing on "Assessment of suitable management practices against Banana stem weevil in Kolli hills from 4th month to 8th month to control the incidence of stem weevil in Hill Banana" was carried out in five farmers' field in an area of 2.0 ha in Thattaiyengarpatty village, Puthuchattiram block, Namakkal District during Kharif season 2019 - 20. Ariyur Nadu village is located at an altitude of 1200m extend between 11 0 00' to 11.0 36'10" N latitude and 77 0 40' to 78 0 30'00" E longitude with 305 meters above mean sea level..

- **Crops grown**

  Coffee, Black pepper, Jack fruit, Hill banana, Pineapple, oranges, Tapioca and other spices are the major crops grown in AriyurNadu village to an area 122 ha under rainfed condition. Hill Banana is grown as mono cropping for two to three years. They are cultivating by utilizing rainfall and well water with less management.

- **Season**

  The main cropping systems followed by the farmers are Banana-Tapioca-Pineapple are the major cropping system followed in Kharif/Rabi season at Ariyur nadu of Kolli hills Taluk of Namakkal districts.

- **Farming situation (Rainfed /Irrigated) – Rain fed condition**

  Rainfall is major source of iirrigation with well water as supplemental irrigation during scarcity. Well source of irrigation. Fifteen per cent (15%) of the farmers whereas 85 % of the farmers followed rain water as source of irrigation to grow the crop.

- **Soil type and fertility status**

  The experimental soil type was black in colour, red soil in texture and non calcareous. The soil was light acidic in soil reaction (6.25), medium in organic carbon (1.4%), low in available nitrogen (212 kg ha^{-1}), medium in available phosphorus (16.42 kg ha^{-1}), medium in available potassium (144 kg ha^{-1}).

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

  The annual rainfall of Kolli hills was 805 mm with 48 rainy days. Of which, experimental season received received was September 2019 to December 2019, average rainfall of 458 mm with 31 rainy days. Maximum monthly mean temperature was 30.6^{o}C and minimum was 20.8^{o}C.

8. Problem definition / description:

- Stem weevil incidence in Namaran banana - 25%
- Crop Lodging - 15%
- Un awareness on Stem weevil management practices
- Non adoption of crop rotation

9. Technology Assessed:

TO1	Recommended practice Source: NRCB, 2009)	Banana pseudostem trap @ 100/ha Swabbing the cut surface of the traps with Beauveria bassiana or Heterorhabditis indica @ 20g /trap. (Source: NRCB, 2009)
TO2	Alternate practice (Source: CTCRI, 2015)	Injection of Menma @ 50 ml / lit of water in sucker or smear the cow dung paste with Nanma. Foliar spraying of Nanma @ 50 ml / lit of water during 4th or 5th month and 7th or 8th month of DAP. (Bio molecules developed from cassava leaves & tuber rind)
TO3	Farmers practice	Farmers practice) Cultivation of local variety (Namaran) with Non adoption of crop rotation.

10. Critical inputs given:

S.No.	Name	Qty (kg /litre)	Unit cost (Rs.)	Total cost (Rs.)
1.	Beauveria bassiana	0.4lt	300	300
2.	Bio Molecules (Nanma, Menma)	6 litres	1800	340
3.	Monocrotophos 2 lit. /ha.	Farmers practice		

8. Results:

Table : Performance of the technology

Technology Option	***No.of trials***	***Yield (q/ha)***	***Gross cost (Rs.in Lakhs)***	***Net (Rs.in Lakhs)***	***B:C ratio***
Technology Option 1 Banana Psuedo stem tarp@100/ha.2. Swabbing cut surface of trap with Beauveria bassiana@20g/trap (Source-NRCB-2009)	5	168	0.748	0.932	2.25
Injection of Menma@ 50 ml/litre of water in sucker or smear the cow dung paste with Nanma 2. Foliar spray of Nanma @ 50ml/litre of water during 4th or 5th month and 7th or 8th month of DAP (Source- CTCRI,2015)		178	0.819	0.961	2.17
Farmers Practice - Cultivation of local variety with non adoption of crop rotation		142	0.729	0.691	1.95

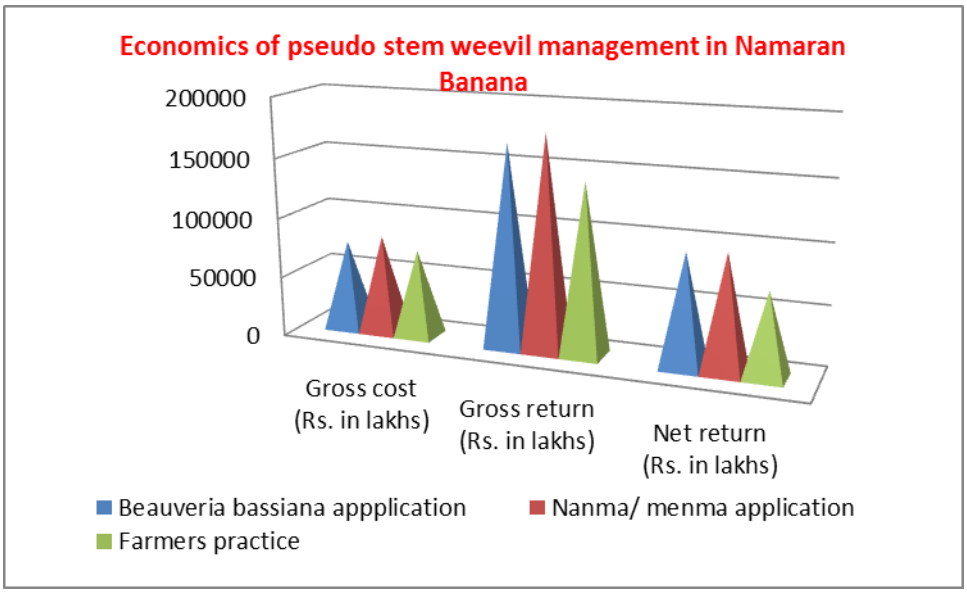
Table 2. Other Parameters observed

Parameters	**Technology 1 (Pseudo stem trap with *Beauveria bassiana*)**	**Technology 1 (Spraying of Nanma/Stem injection of Menma)**	**Farmers practices without crop rotation with Monocrotophos 36 WSC application**
Plant population	269	272	261
Number of bunches per tree	5.04	5.24	4.2
Number of fingers / bunches	12.2	13.4	10.6
Number of plants infected	85	85	92
Percent incidence of weevil before treatment	31.59	31.25	35.2

Percent incidence of weevil after treatment	5.95	4.04	8.43
yield (Q/ha)	168	178	142
Gross cost Rs. /ha	74795	81875	72875
Gross return Rs. /ha	168000	178000	142000
Net return Rs. /ha	93205	96125	69125
BCR	2.25	2.17	1.95

Description of the results

- ✓ The on farm trials were conducted in ten farmer's field at Ariyur Naadu, of Kolli hills during Kharif season 2018
- ✓ Summer ploughing, removing the dried trashes in time, Foliar spray of Nanma @ 50ml/litre of water during 4th or 5th month and 7th or 8th month of DAP, Injection of Menma@ 50 ml/litre of water in sucker or smear the cow dung paste with Nanma, controlled the incidence of stem weevil in banana with highest fruit yield of 178 q/ha with net return of Rs.96125 with BC ratio of 2.17. Whereas the benefit cost ratio was noticed at following of Banana Psuedo stem tarp@100/ha^{-2}. Swabbing cut surface of trap with Beauveria bassiana@20g/trap with BC ratio of 2.25.



Constraints faced:

1. Due to vagaries rainfall, the crops is grown under rainfed condition the yield is affected due to various management problems.

9. Feed back of the farmers involved:

- ➢ Nanma/Menma application showed better in controlling the pseudo stem weevil in Namaran banana, whereas the cost is to be reduced for practicing banana cultivating farmers.
- ➢ Beauveria bassiana trap is cheaper method and easier to trap the pseudo stem weevil.
- ➢ Purchase of locally available pesticide has been followed till now with non adoption of crop rotation.
- ➢ Purchase of bio pesticide will be followed in the following years to control the stem weevil.
- ➢ Coming year, the technology will be followed and communicated to the other farming area of kolli hills.Higher expenditure for pesticide application will be changed.

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

- Nanma/Menma application performed very well under the field controlled the pseudo stem weevil in banana. Cost of application is higher, is to be reduced.
- Banana pseudo stem trap of Beauveria bassiana swabbing is found to control the stem weevil.
- Awareness should be created to do bioagents pesticide application instead of chemical pesticide to control the incidence of stem weevil in hill banana.

OFT-7 (IDM)

1. **Thematic area:** Integrated Disease Management
2. **Title:** Assessment of suitable control measure against foot rot in black pepper in Kollihills
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 "Assessment of suitable control measure against foot rot in black pepper in Kollihills " was carried out at five farmers' field in an area of one ha in Vasalurpatti village, Kollihills block of Namakkal District during Kharif, Rabi and Rabi suemmer season 2019 - 2020. Vasalurpatti village is situated at 11.10' and 11.23' North latitude and 78.17' and 78.28' East longitude and at an elevation of 1300 m above mean sea level.

- **Crops grown**

  Rainfed Horticulture is the main profession of this village. Here, Black pepper is the major crop, which is cultivated in an area of 310 ha. Ninety eight per cent of the pepper area is under the variety Panniyur-1 and the rest are with Kottanadan, Karimunda and Kurumilagu local**.**

- **Season**

  The main cropping systems followed by the farmers are Black pepper + Coffee (Robusta). Since it is a perennial spice crop, most of the farmers cultivated Black pepper throughout the year under rainfed condition but the main yielding season is Feb – June.

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

  99 % of the farmers cultivate black pepper under rainfed condition whereas 1 % of the farmers followed flood irrigation around the vine basin and drip irrigation.

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

  The average annual rainfall of Namakkal District during 2019-20 was 990.9 mm. Vasalurpatti village received an average rainfall of 83.7 mm with 3 rainy days in July, 232.5 mm of rainfall in 6 rainy days during August, 197.7 mm of rainfall in 8 rainy days in September, 284 mm rainfall in 13 rainy days during October and 6 mm of rainfall received during December in 1 rainy day and 12 mm in March 2020. During the study period (July,2019 – March 2020), totally 815.9 mm of rainfall was received in 32 rainy days. Maximum monthly mean temperature was 21.3^{o}C and minimum was 16.7^{o}C. Maximum monthly mean relative humidity was 95.0 per cent and minimum was 80.0 per cent at 07.22 and 14.22 hr, respectively.

- **Soil type and fertility status**

  The soil type is red/lateritic with a pH of 5.8 and EC of 0.042 dSm^{-1} with a soil nutrient status of high Nitrogen (214 kg/ ha), high Phosphorus (12 kg / ha) and ,medium Potassium (116 kg /ha).

1. **Problem definition / description: (one paragraph)**

- In Vasalurpatti village, the Black pepper is mainly affected by foot rot disease caused by Phytophthora capsici, but growers do not take any control measures, either prophylactic or curative.
- Some growers spray one per cent Bordeaux Mixture or 0.2 per cent Copper Oxy Chloride before the onset of North East Monsoon.
- This disease became very severe during May – June and October to January, which resulted 50 – 90 % of drying of pepper vines and 90 % reduction in pepper yield.
- It is the most destructive of Pepper and all parts of the vine are vulnerable to the disease and the expression of symptoms depend upon the site or plant part infected and the extent of damage.
- 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.
- Because of the drastic fall in revenue from pepper plantations in Kollihills due to persistence of foot rot disease in spite of application of fungicides. In order to address these issues in Pepper plantations in Kollihills, KVK, Namakkal has formulated and implemented an OFT on Assessment of suitable control measure against foot rot in black pepper in Kollihills in 5 farmers field covering one ha area at Vasalurpattii village during July 2019 – March 2020.
- The objective of the study was to assess the performance of suitable organic way of control measure as an alternate chemical / indigenous control measure, reduce the incidence of foot rot, improve the beneficial microorganism in the soil to combat *Phytophthora* as wells as to increase the yield and net income of the farmer.
- The intervention consisted of four components viz., Soil application of *Trichoderma harzianum* powder, Application of IISR Tricho capsule & IISR PGPR capsules in alternate month, soil and foliar application of IISR pepper booster at spike initiation and spike development period

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

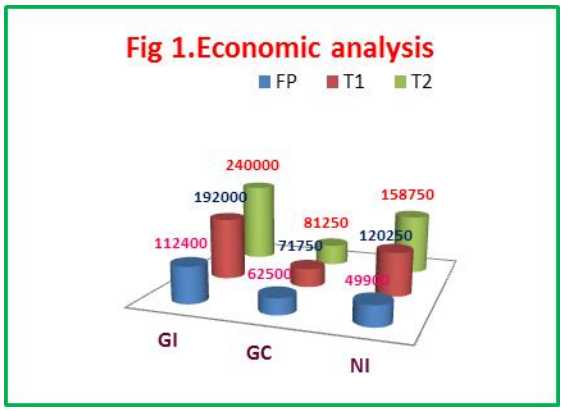
Technological Options		Technology details
TO 1	Farmers practice	Drenching of Copper oxy chloride @2.5 gm/lt : 2-3 lt/vine Butter milk: 10 lt + 10 lt water = 500 ml/vine at 2 months interval.
TO2	Recommended practice (Source: TNAU,CBE,2013)	The following formulation can be drenched in the soil twice (May – June and October - November). Trichoderma viride or T.harzianum @ 50 g/vine + FYM @ 5kg/vine
TO3	Alternate practice (Source: IISR,Calicut,2017)	IISR Bio capsule – Trichoderma harzianum 1018 CFU @ 10 Nos/ 0.4 ha IISR Microbial consortium (Micrococcus luteus, Enterobacter aerogens & Micrococcus sp) for growth promotion @ 100gm/vine Soil pH based IISR crop booster for Pepper @ 5g/litre of water, Once during spike initiation with the onset of monsoon & another after 2 months.

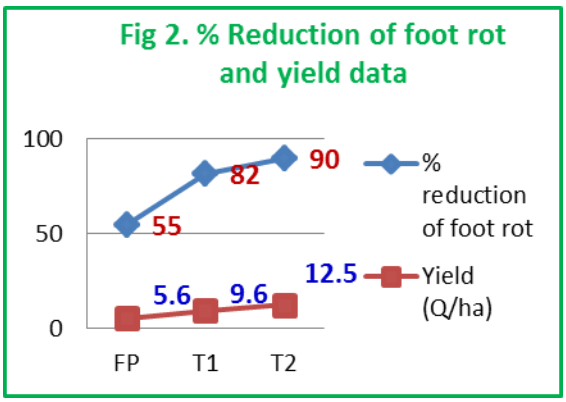
7. Critical inputs given: (along with quantity as well as value)

Name of the Critical Inputs	Quantity per trial (Kg/No)	Cost of inputs / Trial (Rs)	Total cost (Rs.)
Trichoderma harzianum powder	10 kg	2500.00	5000/-
IISR Tricho capsule	9 Nos	900.00	
IISR PGPR capsule	6 Nos	600.00	
IISR Pepper booster	3 kg	750.00	
Soil analysis	1 No	250.00	

8. Results:

Technology Option	*No.of trials*	*Yield (Q/ha)*	*Net Returns (Rs. in ha)*	*B:C ratio*	*Data on Other performance indicators**
Farmers Practice	*5*	5.6	0.499	1:1.8	-
Technology 1		9.6	1.202	1:2.7	-
Technology 2		12.5	1.587	1:2.9	-





Description of the results:

Table 1: Reduction of foot rot incidence and yield parameters in Black pepper

Parameters	FP	T1	T2
% reduction of foot rot	55	82	90
% reduction of yellowing of leaves	45	89	94
Yield / vine (kg)	0.5	0.8	1
Yield (Q/ ha)	5.62	9.6	12.5
Gross income (Rs/ha)	112400	192000	240000
Expenditure (Rs/ha)	62500	71750	81250
Net income (Rs)	49900	120250	158750

- Among the technologies compared, the highest foot rot reduction (90 %) was observed in T2 followed by T1 with the value of 82%. The lowest foot rot reduction (55%) was noticed in farmers practice (T1)

- With respect to % reduction of yellowing of leaves in black pepper, T2 recorded maximum reduction of yellowing of leaves (94%), which was followed by T1 (89%) and the minimum was noticed in FP (45%).
- Likewise among the technologies tested, the maximum yield per vine & per ha (1 kg, 12.5 Q) was recorded in T2, followed by T1 (0.8 kg, 9.6 Q) whereas FP recorded lowest yield of 0.5 kg per vine and 5.6 Q/ha respectively and the black pepper sold at the rate of Rs.200/kg (Fig.2)
- The economic analysis (Fig.1) revealed that the maximum net return (Rs.158750/-) was obtained from T2 than T1 (Rs.120250/-) and FP (Rs.49900/) . The Cost: Benefit ratio also high (1:2.9) in T2.

9. **Feedback of the farmers involved:**

Better management of foot rot through timely application of IISR Tricho capsules and PGPR capsules and farmers felt that capsule form of Trichoderma application is very easy when compared to talc formation.

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

The capsule application ensures that smart delivery of beneficial microorganisms through encapsulation was intimated.

OFT -8 (Cropping system)

1. **Thematic area:** Cropping system
2. **Title**: Assessment of vegetable + flower based intercropping system 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 "Assessment of vegetable + flower based intercropping system in Namakkal District " was carried out at five farmers' field in an area of one ha in Karaikuruchi Pudhur, Pudhuchathiram block of Namakkal District during Rabi. Karaikuruchi pudhur village is situated at 11.38^0 N latitude and 78.16^0 E longitude and at an elevation of 218 m above mean sea level.

❖ **Crops grown**

The main cropping systems followed by the farmers are Small onion - Groundnut/ Pulses – Flowers.

In this village, small onion is the major vegetable cultivated in an area of 610 ha.

❖ **Season**

99 % of the farmers of this block cultivates small onion in Kharif and Rabi as irrigated crop whereas Groundnut/ pulses in Kharif season

❖ **Farming situation (Irrigated/Rain fed)**

Both open wells (depth 100 -110 feet) and bore wells (Depth 700-1300 feet) act as a main irrigation source. 70 % of the farmers used drip irrigation whereas 30 % of the farmers followed flood irrigation to cultivate vegetables and Groundnut/ Pulses mainly grown as a rainfed crop.

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

The average annual rainfall of Namakkal District during 2019-20 was 990.9 mm. During the study period (August 2019 – Feb 2020), Karaikuruchi Pudhur village received an average rainfall of 48.5 mm in 7 rainy days in August, 138.2 mm in 11 rainy days in Septeber, 154.4 mm in 10 rainy days in October, 33 mm in 3 rainy days in November and 43 mm in 2 rainy days December. Totally 417.1 mm of rainfall was received in 33 rainy days. Maximum monthly mean temperature was 30.7 ^oC and

minimum was 24.8^{o}C. Maximum monthly mean relative humidity was 87.0 per cent and minimum was 62.5 per cent at 07.22 and 14.22 hr, respectively.

- **Soil type and fertility status**

  The soil type is red sandy loam with a pH of 7.3 and EC of 0.067 dSm^{-1} with a soil nutrient status of low organic carbon (0.5 %), low available Nitrogen (214 kg/ ha), medium available Phosphorus (13.8 kg / ha) and medium available Potassium (196 kg /ha).

5. Problem definition / description: (one paragraph)

- In this village the farmers faced major problems such as low yield in small onion (4 t/0.4 ha) due to pest & disease incidence, in efficient utilization of nutrients applied to the soil and low income.
- In response to the wastage of applied nutrients and spacing between plants Krishi Vigyan Kendra, Namakkal, Tamil Nadu has formulated and implemented an OFT on Assessment of vegetable + flower based intercropping system in Namakkal District in 5 farmers field covering 1 ha area at Karaikuruchi Pudhur village during August 2019 – Feb 2019.
- The objective of the study was to assess the performance of flower / vegetable based intercropping system for proper utilization of land, resources , applied nutrients, reduce the incidence of pest and diseases as wells as to increase the net income of the farmer.
- The intervention consisted of four components *viz.*, Supply of chrysanthemum planting material and Chilli seed to promote intercropping system with small onion, foliar spray of micronutrients and integrated pest management practices for major pest and diseases.

6. Technology Assessed:

Technological Options		Technology details
TO 1	Farmers practice	Sole cropping of small/ aggregatum onion with a spacing of 15 x 15 cm
TO2	Recommended practice (Source:UAS,Dharwad,2010)	Aggregatum onion (15 x15 cm) + Chilli (75 x 60 cm) intercropping system
TO3	Alternate practice (Source: DOGR, Pune 2013)	Aggregatum onion (15 cm) + Chrysanthemum (60x60cm) intercropping system

7. Critical inputs given: (along with quantity as well as value)

Name of the Critical Inputs	**Quantity per trial (gram / Nos)**	**Cost of inputs / Trial (Rs)**	**Total cost**
TNAU Chilli hybrid Co1	10 g	200.00	Rs.3200/-
Chrysanthemum rooted cuttings var.Co1	2000 Nos	3200.00	

8. Results:

Table : Performance of the technology

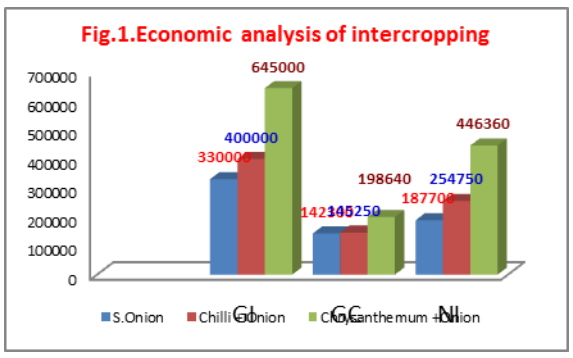
Technology Option	*No.of trials*	*Yield (Q/ha)*	*Net Returns (Rs. in lakh./ha)*	*B:C ratio*	*Data on Other performance indicators**
Farmers Practice	*5*	110	187700	1:2.32	-
Technology 1		40	254750	1:2.75	-
Technology 2		107.5	446360	1:3.25	-

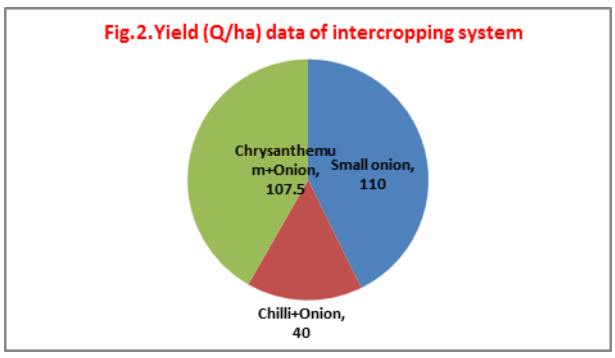
**** Other performance indicators: such as pest intensity, weed population, test weight, duration etc***

Description of the results:

Parameters assessed	FP - T1	T2	T3
No.of harvest made	Sole crop Single harvest	Chilli - 6 harvest + small onion- 1 harvest	Chrysanthemum 40 harvest + small onion – 1 harvest
Average yield/ day / 25 cent	1550 kg	180 kg 915 kg	15 kg 940 kg
Total Yield (Q/ha)	110 Small onion alone	40 Dry chilli – 10 q Small onion – 100 q	107.5 Chrysanthemum flower – 60 q Small onion – 95 q
Gross income (Rs/ha)	330000	400000	645000
Gross cost (Rs/ha)	142300	145250	198640
Net income (Rs/ha)	187700	254750	446360

- With respect to number of harvests made, T3 recorded a maximum harvests (41 nos) , followed by T2 (7 harvests) whereas single harvest was made in T3 since it is a sole cropping of small onion.
- In 20 cent area , 15 kg of chrysanthemum flowers harvested/day, totally 600 kg of flowers harvested in 40 days and sold @ Rs.60/kg
- In chilli 180 kg of dry pods were harvested / pods and sold at the rate of Rs.120/kg and small onion sold at the rate of Rs.50/kg
- With respect to yield, the maximum yield per ha (110 quintals) was recorded in T1 whereas T2 and T3 recorded 40 Q and 107.5 Q/ha respectively (Fig.2)
- Farmers sold the small onion @ Rs.3000/Q, Dry chilli @ Rs10000/Q and the chrysanthemum flowers @ Rs.6000/Q
- The economic analysis (Fig1) revealed that the highest net return (Rs. 446360 /-) was obtained from Chrysanthemum + small onion intercropping system when compared to Chilli + small onion intercropping system (Rs. 254750 /-) and Sole cropping of small onion (Rs. 187700/-). Therefore, farmers can get additional profit of Rs.258660/- while growing Chrysnathemum + small onion (T3) with good market price. The Cost: Benefit ratio also highest (1:3.25) in case of T3.





9. Feed back of the farmers involved:

- Farmers sold the flowers and vegetables at Namakkal market & fetched better price
- Increased net income / unit area than sole cropping
- Reduced weed menace (85%) in the early crop growth stage.

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

Chrysanthemum + small onion intercropping system may be recommended during Kharif season to exploit the full yield potential of both the crops and better utilization of space between rows.

OFT -9 (Animal Nutrition)

1. Thematic area: Livestock Nutrition Management

2. Title: Assessing technology for enhancing the milk Fat and SNF by supplementing sodium bicarbonate and yeast in cross bred dairy animals

3. Scientists involved: Dr. T. Hariharan Scientist (Animal Science) & Dr.N.Akila, Senior Scientist & 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. Low fat % and SNF % is a common problem in high yielding animals and farmers frequently compliant especially during summer.

5. Problem definition / discription:

Milk production with fat and SNF content is one of the most important factors affecting dairy farm profitability and the development of national economy, as well as the living standard of rural and urban societies, Because, it directly or indirectly influences the profitability of dairy farming. Cows that have been highly selected for milk production in recent decades have suffered low fat and SNF and its deterioration has been caused by a network of genetic, environmental and managerial factors and their complex interactions. Majorly, nutritional imbalance is the prime reason for causing low milk production with less fat and SNF content in dairy animals.

6. Technology Assessed:

TO1	Farmers practice	Sodium bicarbonate and/or yeast not supplemented in cross bred dairy animals
TO2	Recommended practice (Allahabad Veterinary University, 2017)	Sodium bicarbonate supplementation @ 50g/day/animal
TO3	Alternate practice (Allahabad Veterinary University, 2017)	Supplementation Yeast bolus @ 2 bolus/day/animal
TO4	Combination of TO2 and TO3 (Allahabad Veterinary University, 2017)	Supplementation of Sodium bicarbonate @ 50g/ day/ animal and Yeast bolus @ 2 bolus/day/animal

7. Critical inputs given:

S.No	Name	Qty (Kg/Nos)	Unit cost (Rs.)	Total cost (Rs.)

1.	Sodium bi-carbonate	20 kg (10x50gx45)	33	760
2.	Yeast bolus	900Nos (10x2x45)	7	6,300
Total cost				7,060

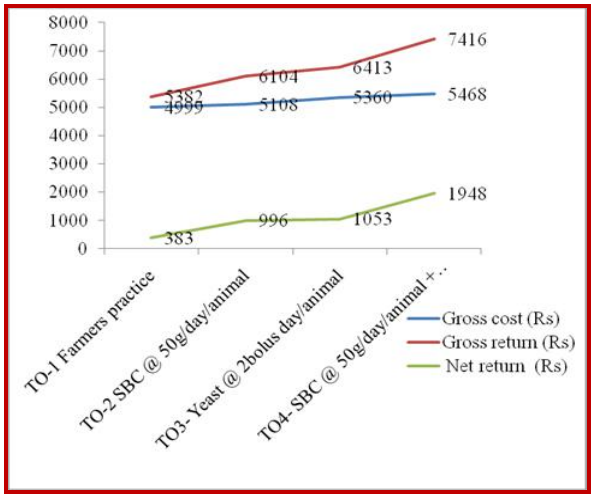
8. Results:

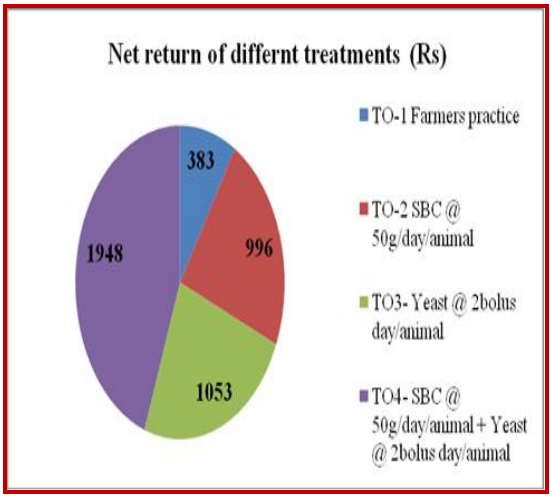
Table: Performance of the technology

Technology Option	***No.of trials***	***Yield (t/ha)***	***Net Returns (Rs./animal)***	***B:C ratio***	***Data on Other performance indicators****
Farmers Practice: Sodium bicarbonate and/or yeast not supplemented	5	4.6 lit/animal 207 lit for 45 d	5382	2.07	Fat 4.0 % and SNF 8.1%
Technology 1 (Sodium bicarbonate supplementation @ 50g/day/animal)		4.8 lit/animal 216 lit for 45 d	6104	2.20	Fat 4.2 % and SNF 8.3 %
Technology 2 (Supplementation Yeast bolus @ 2 bolus/day/animal)		5 lit/animal 225 lit for 45 d	6156	2.15	Fat 4.2 % and SNF 8.4 %
Technology 3 (Supplementation of Sodium bicarbonate @ 50g/ day/ animal and Yeast bolus @ 2 bolus/day/animal)		5.4 lit/animal 243 lit for 45 d	7416	2.36	Fat 4.3 % and SNF 8.4 %

Parameters	**TO-1 Farmers practice**	**TO-2** SBC @ 50g/day/animal	**TO3**- Yeast @ 2bolus day/animal	**TO4**- SBC @ 50g/day/animal + Yeast @ 2bolus day/animal
Milk yield (average)	4.6 lit/day/animal	4.8 lit/day/animal	5lit/day/animal	5.4 lit/day/animal
Fat %	4.0%	4.2%	4.2%	4.3%
SNF %	8.1%	8.3%	8.4%	8.4%
Gross return (Rs)	5382	6104	6413	7416
Gross cost (Rs)	4999	5108	5360	5468
Benefit Cost Ratio	2.08	2.20	2.20	2.36

Fig 1. Economics of supplementing sodium bicarbonate and yeast in cross bred dairy animals





Constraints faced:

- Recording of milk production, fat % and SNF % of the selected animal was difficult.
- Selection of animals with same age with same number of calving with same lactation period was difficult.
- Cost of supplementation of yeast bolus/animal is high

9. Feed back of the farmers involved:

The farmers felt that supplementation of both Sodium bicarbonate @ 50g/ day/ animal and Yeast bolus @ 2 bolus/day/animal in dairy animals has promising results and able to produce the better milk yield with better fat and SNF % . However, the farmers expressed the cost of supplementation of yeast bolus/animal was high. As the returns are good, the farmers are more satisfied with the technology and interested to use in future also.

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

The cost of Yeast bolus has to come down for wider application and otherwise supplementation of sodium bicarbonate alone is easy to follow in the field conditions.

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	Paddy	System of rice intensification technology	Demonstration on SRI method of paddy cultivation.	Training, demonstration, ATMA Farm school, frequent field visit and continous advisories through phones	2	122	48.8
2	French bean	Varietal evaluation with ICM practices	ICM Practices in French bean var.Arka Sharath	Training, Method demonstration, Field visits, advisories and Telecast of farmers success story	1	23	2
3	Chrysanth emum	ICM practices with new	Demo on ICM practices in		2	52	8

		variety	Chrysanthemum var.Co1	programmes through DD Podhigai			
4	Banana	Integrated nutrient management practice	Demonstration on banana-cowpea intercropping with ICM practice	Training, demonstration, field visit and regular advisories	3	25	18
5	Sugarcane	Integrated pest management practice	Demonstration on bio-intensive IPM module in sugarcane		2	10	3.0
6	Chilli	Integrated pest and disease management practices	Demonstration on bio-intensive IPM module in Chilli		3	10	3.0
7	GIFT Tilapia	Production management	Demonstration of GIFT Tilapia	Training, demonstration, group discussion with farmers, exhibition and meeting with extension personnel	12	22	8
8	Integration (IFS)	Residue recycling / Management	Demonstration of integration farming system in low cost input	Training, demonstration, group discussion with farmers, exhibition and meeting with extension personnel	4	3	2

b. Details of FLDs (Information is to be furnished in the following tables category wise i.e. cereals, horticultural crops, oilseeds, pulses, cotton and commercial crops.)

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	Maize	ICM practices	Demonstration on Integrated Crop Management Practices in maize	Kharif 2020	ICAR	4	4	0	10	10	Water quality changed & incidence of fall army
2	Small onion	ICM & IDM practices	Demonstration on Biological control of Basal rot in Aggregatum onion with ICM practices	Rabi 2019	ICAR	3	3	15	10	25	-
3	Tomato	ICM practices	Demonstration on ICM practices in Tomato	Rabi 2019	ICAR	4	4	10	0	10	-
4	Chilli	IPM	Demonstration on bio-intensive IPM module in Chilli								-
5	Tapioca	Cropping system	Demonstration of row intercropping system in	Rabi 2019	ICAR	3	3	25	15	40	-

			Tapioca with ICM Practice								
6	Hill Banana	ICM practices	Demonstration of ICM practices in Hill Banana (Namaran & Red banana) of Kollihills	Kharif & Rabi 2019	ICAR	3	3	10	-	10	-
7	Castor	Varietal introduction and ICM practices	Demonstration on ICM Practices in Castor based intercropping	Kharif 2019	ICAR	4	4	2	8	10	-
8	Sugarcane	ICM practices	Demonstration on Sustainable Sugarcane Initiative technology in Sugarcane	Kharif 2019	ICAR	2	2	-	5	5	-
9	Sugarcane	IPM practices	Demonstration on bio-intensive IPM module in sugarcane	Kharif , 2020	ICAR	3	3	5	10	15	Ratoon crop, one year duration , yeild data collection will be completed at August/ September 2020
10	IFS	Integrated farming system	Demonstration on Integrated Farming System (IFS) Model in drought prone areas	Rabi, 2019-20	ICAR	1.2	1.2	3	-	3	-
11	Composting technology	Composting technology	Demonstration on enriched poultry compost preparation	Rabi 2019	ICAR	0.1	0.1	9	1	10	-

c. 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					
Maize	Kharif, 2020	Irrigated	Red Sandy loam	Low	Medium	Medium	Sorghum	19.02.2020	30.05.2020	-	-
Small onion	Rabi 2019	Irrigated	Red sandy loam	Medium	Medium	High	Small onion	19.12.19	2.3.2.20	87.8	9
Tomato	Rabi 2019	Irrigated	Red Sandy loam	Low	Medium	Medium	Ground nut	28.11.19	20.03.20	397.9	18
Chilli	Rabi 2019	Irrigated	Red Sandy loam	Low	Medium	Medium	Ground nut	28.11.19	20.03.20	342	22
Tapioca	Rabi 2019	irrigated	Red sandy loam	Medium	Medium	Medium	Ground nut	25.12.19	25.3.20	73	5
Hill Banana	Kharif & Rabi 2019	Rainfed	Lateriric soil	High	Medium	Medium	Hill banana	4.7.19	20.1. 20	816.8	27
Castor	Kharif 2019	Rainfed	Red Sandy loam	Medium	Low	High	Sorghum	02.09.19	20.02.20	620.5	34
Sugarcane	Kharif 2019	Irrigated	Sandy clay loam	Medium	Medium	High	Paddy	02.09.19	09.04.20 (harvested for	620.5	34

									seed / sett purpose)		
Sugarcane	Kharif, 2019	Irrigated	Red Sandy loam	Low	Medium	Medium	sugarcane	20.06.2017	12.10.2020	-	-
IFS	Rabi, 2019-20	Rainfed	Red Sandy loam	Low	Low	Medium	Green gram	04.12.19	10.07.20	83.5	5
Composting technology	Rabi 2019	Irrigated	-	-	-	-	-	17.10.19	27.02.20	397.9	18

d. Technical Feedback on the demonstrated technologies

S. No	Feed Back
1.Small onion	Three times soil application of bio inputs and foliar spray of IIHR vegetable booster at 30 & 45 DAS exhibited better reduction of basal rot and increased the yield with 6.2 tonnes/0.4 ha @ sold at the rate of Rs.45-50/kg.
2.Tomato	The yield in demo plot was 500.25 q/ha with net return of Rs.175579/ha & BC ratio of 2.41. The yield increase in demo plot was 17.92% than check.
3.Chilli	The yield in demo plot was 46.8.25 q/ha with reutn return of Rs.138509/ha & BC ratio of 1.52. The yield increase in demo plot was 18.78% than check.
4.Tapioca	320 kg of Bengal gram seed obtained from 1 ha area through intercropping with Tapioca in 3 months period and sold @ Rs.75/kg. Cost involved for 2 weeding (Rs.12000/-) was reduced due to smothering effect of Bengal gram and vegetable cowpea grown as a intercrop.
5.Hill Banana	In Hill banana, each bunches consists of 50-60 fingers / 5-7 hands and sold at the rate of Rs.5/ fruit & Rs. 250 – 300/bunch.
6.Castor	Cultivation of castor hybrid - YRCH-1 recorded more number of spikes per plant (39 nos), more number of capsules per spike (52 nos) and higher seed yield (1.49 ton/ha) compared to check variety. Fetched higher castor market price (Rs.45/kg) compared to groundnut and most of the farmers were accepted for preference of YRCH-1 hybrid and recorded higher farm income (Rs.42805/ha) under rainfed condition.
7.Sugarcane	Demonstration results revealed that more establishment percentage (96), more number of tillers per clump (10.6), higher Cane length (11.4 feet), more internode length (14.6 cm), more individual cane weight, higher Cane yield (119.84 ton/ha) and BCR (2.82) obtained from new sugarcane variety (COC-11015) under SSI technology. Cultivation of new variety for seed purpose recorded good gross income in short period of time (7 months) compared to industry purpose, 40 percent of water and 20 percent of labour saved under SSI Method.
8.Composting	Enriched poultry manure compost was recorded lowest C:N ratio - 10.38, and highest manurial value of Nitrogen -2.58%, Phosphorus-2.89%, Potassium-1.02 than poultry manure
9.Mulberry leaves for better milk yield in crossbred dairy animals	Milk yield (6.74 lt/animal/day) and fat % of milk (3.82) was increased in animals fed with mulberry leaves than the check animal (6.1 lit/day/animals & 3.50 %)
10.Bypass fat supplementation for better milk yield inHF	The cost of supplementation of by-pass fat was high (Rs.11/animal/day @ 100g/animal/day, By-pass fat Rs. 110/kg). As the returns are good (Rs.23/animal/day), the farmers are more satisfied with the technology and interested to use in future also.
11.Rapid detection kit (Ketocheck) for ketosis in bovine	Ketosis is a common metabolic disorder of adult cattle typically occurring in dairy cows in early lactation, due to negative energy balance. By using Rapid detection kit (Ketocheck) in early lactation is useful technology for earlier detection of ketosis at field level and there by manage negative energy balance in early lactation by proper feeding management.
12.Performance of TANUVAS Aseel Chicken	Poultry products are expensive in rural areas due to their non availability.Rearing native chicken varieties in rural backyards improved the availability of meat and helpful to alleviate the protein hunger besides providing subsidiary income to the rural farmers.Compare with other native chicken varieties, TANUVAS Aseel Chicken performed better in 3 month of study period in terms of mean bodyweight with 1.013g, FCR of 3.43 and livabilty of 94.21 under rural field condition.

13.Intensive culture of Pangasius in freshwater culture	Pangasius is stocked at high densities (around 40 fish per m^2) and grown for around 5-6 months before reaching its harvest weight of around 1kg. Resistance to low dissolved oxygen, Males and females grow at similar rates
14.Minerals Supplementation on Growth and Survival of *Litopenaeus*	The enriched trace minerals dietary composition have a significant impact on immune functions, disease resistance, and stress free of shrimp increasing trend in survival with the increase of magnesium addition to the water.
15.Demonstration of Integrated culture of Grass carp (*Ctenophargngoden idella*) and vegetable	Aquaponics system is environmental friendly soilless fish and vegetable production system. The systems improved the high density fish pond water quality and increase fish production. The system can be used in draught prone, flood prone and coastal saline affected soil region to produce fish and vegetable round the year.

e. Farmers' reactions on specific technologies

S. No	**Feed Back**
1.Small onion	Farmers felt that the basal rot incidence was very less in small onion demonstrated plots and also yielded 6 tonnes/0.4 ha, provided good irrigation and maintenance.
2.Tomato	Sucking pest and nutrient deficiency in fruiting stage was common. Hence package of practice for tomato culcivation may be trained well in advance. Critical inputs like vegetable booster and arka microbial consortia may be made available at local markets are highly useful.
3.Chilli	Sucking pest and disease management in vegetative and fruiting stage was common. Hence package of practice for chilli culcivation may be trained well in advance. Critical inputs like setting of sex pheromone trap, yellow sticky trap, foliar spray of BT, H.A. NPV and *Beauveria basssiana* and arka microbial consortia may be made available at local markets are highly useful.
4.Tapioca	The weed menace in early growth stage of the Tapioca was minimized successfully by intercropping. Additional income was obtained from chick pea and vegetable cowpea cropping.
5.Hill Banana	Wilt incidence was very minimum (90%) in treated plots . 310 number of bunches harvested per year.
6.Castor	Less incidence of leaf hoppers, botrytis disease under wider spacing in rainfed condition, also recorded higher seed yield and farm income. Cost of cultivation is less compared to groundnut production, less labour required and easy to cultivate under rainfed condition.
7.Sugarcane	Recorded higher cane yield, lengthy cane and more internode length, good farm income in short duration of time due to seed production, lesser number of tillers compared to CO86032 sugarcane variety, very less incidence of early shoot borer and all farmers accepted the new variety and importance of SSI technology with 40 percent water saving and 20 percent of labours saved.
8.Composting	Unaware about the enrichment of poultry manure composting and enrichment with coirpith and pleuorotus.
9.Mulberry leaves for better milk yield in crossbred dairy animals	The farmers felt that supplemented feeding of five kg of Mulberry leaves per animal per day along with TANUVAS Mineral Mixture @50g/day/animal has promising results and able to produce higher average milk yield of 0.64 lit/animal/day with increase in 0.32% fat and 0.17% SNF compare with check.
10.Bypass fat supplementation for better milk yield in HF	The farmers felt that supplementation of Bypass fat @100g/day/animal along with TANUVAS Mineral Mixture @50g/day/animal improved of 0.71lit/animal/day with increase in 0.41% fat and 0.14% SNF compare with check, during early lactation, as drop in milk yelled and milk fat is a major problem in HF dairy animals during early lactation due to negative energy balance.
11.Rapid detection kit (Ketocheck) for ketosis in bovine	By using Rapid detection kit (Ketocheck) in early lactation, farmers felt that they could easily monitor the animals by proper feeding management to avoid ketosis in dairy animals.
12.Performance of TANUVAS Aseel Chicken	Compare with other native breeds, rearing TANUVAS Aseel Chicken at village filed level can be promising small scale backyard enterprise to improve the livelihood of rural farmers.

13.Intensive culture of Pangasius in freshwater culture	Cost of cultivation is less compared to other fish production, less labour required, easy to cultivate and market diversification. Within India
14.Minerals Supplementation on Growth and Survival of *Litopenaeus vannamei*	Efficiency on survival and growth of *L. vannamei* in low salinity water.
15.Demonstration of Integrated culture of Grass carp (*Ctenophargngoden idella*) and vegetable	The aquaponic system can produce fish and vegetable from the integration of aquaculture and hydroponics vegetable production using less water and without soil and fertilizer. it can also be remarked that the aquaponic system is competent to produce sufficient amount of fish and vegetable by recycling the fish waste water from the pond.

f. Extension and Training activities under FLD

Sl.No.	Activity	No. of activities organised	Date	Number of participants	Remarks
1	Field days	2	17.12.2019	16	Demonstration on high yielding castor hybrid YRCH-1 field day conducted at Moolakadu village along with line department officials and awareness created on YRCH-1 Castor hybrid and ICM practices.
		1	06.02.2020	15	Demonstration of new sugarcane variety COC-11015 under SSI Technology and awareness created on new sugarcane variety, SSI Technology, water saving and integrated pest management practices.
2	Farmers Training	15	25.4.19 26.04.19 05.07.19 07.07.19 09.07.19 09.08.19 20.8.19 25.09.19 7.11.19 13.11.19 15.11.19 21.11.19 26.11.19 12.12.19 20.1.2020	306	1 Two On and two off campus training programme on integrated crop management in castor, sugarcane SSI Technologies and micro irrigation system at KVK Namakkal, Kokkalai and Pallipalayam. 2.Demo on seed bulb treatment in small onion with bioinputs, Foliar application of IIHR veg booster and post-harvest storage techniques 3.Demo on Soil application of *T.viride*,*Pseudomonas fluorescence* and *Paeciliomyces lilacinus* and foliar application of IIHR Banana booster 4.Demo on sowing of Bengalgram as intercrop in Tapioca 5Two oncampus and off campus training programme on Basalrot management in onion, Tapioca cultivation techniquesand Hill banana cultivation practices. 5 One on campus training programme on integrated nutrient management in vegetable at KVK Namakkal 6. One on campus training programme on IPM in sugarcane at KVK Namakkal on 13.11.2019
3	Media coverage	2+2	25.11.2019 19.12.2029 25.11.2019 19.12.2029	14	Castor production technologies disseminated through Doordharshan television on 06.01.2020 & All India Radio, Trichy on 26.12.2019 GIFT Tilapia pond based culture

					technology technologies disseminated through Doordharshan television on 13.01.2020 & All India Radio, Trichy on 26.12.2019
4	Training for extension functionaries	3+3	20.08.2019 10.09.2019 12.11.2019 28.02.2019 23.03.2019	219	Recent production techniques in castor and sugarcane, high yielding varieties. Sustainable sugarcane initiative technology, integrated pest and diseases management in castor and sugarcane. Cage culture technology and Re-circulatory aquaculture systems

g. Performance of Frontline demonstrations

i) 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										
Pulses																			
Oilseeds																			
Castor	Varietal introduction and ICM practices	Demonstration on Integrated Crop Management Practices in Castor based intercropping	YRCH-1	Local hybrid	10	4	15.85	14.13	14.99	9.45	58.62	24650	67455	42805	2.73	21450	42525	21075	1.98
Cereals																			
Maize	ICM practice	Demonstration of ICM practice in Maize	Trail is under progress																
Commercial crops																			
Sugarcane	ICM practices	Demonstration on Sustainable Sugarcane Initiative technology in Sugarcane	COC11015	C0-86032	5	2	1212.5	1184.3	1198.4	885.2	35.38	90240	254660	164420	2.82	88750	188062	99312	2.11
Sugarcane	IPM practice	Demonstration of IPM practice in Sugarcane	COC11015	COC11015	10	3	Trail is under progress												
Millets																			

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										
Vegetables																			
Chilli	IPM practice	Demonstration on bio-intensive IPM module in Chilli	Sirra	Sirra	10	3	50.9	42.7	46.8	39.4	18.78	138509	210600	72091	1.52	142620	177300	34680	1.24
Small onion	ICM	Demonstration on Biological control of Basal rot in Aggregatum onion with Integrated Crop Management practice	Co4	Co4	25	3	184	147	162	112	45	122050	608050	486000	1:4.9	118275	454275	336000	1:3.8
Tomato	ICM practice	Demonstartion of ICM practice in tomato	Sivam	Sivam	10	4	567	435	500.24	424.23	17.92	124565	300144	175579	2.41	132563	254658	122095	1.92
Tapioca	Cropping system	Demonstration of row intercropping system in Tapioca with Integrated Crop Management practice	Mulluvadi	Mulluvadi	40	3	221	192.7	202.33	180	12	183700	606990	423290	1:3.3	180675	540000	359325	1:2.9
Fruits																			
Hill banana	ICM	Demonstration of ICM practices in Hill Banana (Namaran) of Kollihills	Namaran	Namaran	10	3	33.7	27.6	31	25	24	32000	93000	61000	1:2.9	28710	75000	46290	1:2.6
Plantation 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										
Spices and condiments																			
Flowers																			
Others	IFS	Integrated farming system	Demonstration on Integrated Farming System (IFS) Model in drought prone areas	Improved production technology with allied components	3	1.2	Demonstration is in progress.												
Composting	Composting technology	Demonstration of enriched poultry compost preparation	C:N ratio - 10.38, Nitrogen - 2.58%, Phosphorus- 2.89%, Potassium- 1.02	C:N ratio - 13.51, Nitrogen - 2.11%, Phosphorus- 2.68%, Potassium- 0.99	10	0.1	-	-	-	-	-	10500	20000	9500	1.90	7500	10000	2500	1.33

* Economics to be worked out based total cost of production per unit area and not on critical inputs alone.

** BCR= GROSS RETURN/GROSS COST

ii) Frontline demonstrations 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)
Cattle																	
Dairy animals	Livestock feed and fodder management	Demonstration of Mulberry leaves for better milk yield in crossbred dairy animals	10	20	Milk yield 6.74 lit/day/animals	Milk yield 6.1 lit/day/animals	0.64 lit/day/ animal	Fat % 3.82	Fat % 3.50	6143	7886	1743	2.28	6435	7020	585	2.09
Dairy animals	Livestock Nutrition Management	Demonstration of By-pass fat supplementation for better milk yield in HF cross bred cows	10	20	Milk yield 7.91 lit/day/animals	Milk yield 7.20 lit/d/animal	0.71 lit/day/ animal	Fat % 3.71	Fat % 3.30	7515	9967	2452	2.33	7020	8424	1404	2.20
Dairy animals	Livestock Disease Management	Demonstration of rapid detection kit (Ketocheck) for ketosis in bovine	10	20	Ketosis- all samples are negative(0)	Ketosis - all samples are negative(0)	-	-	-	7650	17010	9360	1:2.2	7200	15741	8541	1:2.19
Buffalo																	
Dairy																	
Poultry																	
Desi-bird	Evaluation of Breeds	Demonstration of performance of TANUVAS Aseel chicken under field conditions for meat purpose	20	100	Body weight 1.103 kg	Body weight 0.900 kg	0.203 kg	--	--	158.97	303.90	144.93	2.91	163.96	270	106.04	2.65
Sheep																	

Goat																	

* Economics to be worked out based total cost of production per unit area and not on critical inputs alone.
** BCR= GROSS RETURN/GROSS COST

iii) Frontline demonstrations 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)
Fisheries	Nutrient Management	Effect of Minerals Supplementation on Growth and Survival of *Litopenaeus vannamei* in Low Salinity Water	2	2	3600	2376	51.51	Monthly weight 6.64gm	Monthly weight 6.0gm	685460	1242000	556540	1.81	501966	760320	258354	1.51
Fisheries	Grass carp culture	Demonstration of Integrated culture of Grass carp (*Ctenophargngoden idella*) and vegetable	1	1	1280	920	39.13	Monthly weight 120gm	Monthly weight 97gm	97860	172800	74940	1.76	100100	124200	24100	1.24
Fisheries	Pangasius culture	Demonstration of Intensive culture of Pangasius in freshwater culture	2	2	4431	3354	32.11	Monthly weight 170gm	Monthly weight 110gm	310987	703710	392723	2.3	275926	549516	273590	1.99
Fisheries	IFS	Eco-friendly and modern methods of Fish waste recycling for enhancing farm profitability	2	2	Trial is in progress												

* Economics to be worked out based total cost of production per unit area and not on critical inputs alone.
** BCR= GROSS RETURN/GROSS COST

h) FLDs conducted with the FUNDING OF OTHER SOURCES including CFLD/ATMA/NABARD/other ICAR institutes etc

i) Other Source funded FLDS in CROPS

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										
CFLD -Pulses																				

Greern gram (Kharif)	NFSM	Varietal & ICM	Demonstration of high yielding green gram variety with ICM practices	CO-8	VBN-3	50	20	9.0	7.45	8.14	5.72	42.30	19750	52910	33160	2.67	19500	39000	19500	2
Greern gram (Rabi)	NFSM	Varietal & ICM	Demonstration of high yielding green gram variety with ICM practices	CO-8	VBN-3	25	10	9.65	8.1	8.87	6.1	45.40	21600	57655	36055	2.66	19850	39650	19800	1.99
Black gram (Kharif)	NFSM	Varietal & ICM	Demonstration of high yielding black gram variety with ICM practices	VBN-6	VBN-4	50	20	8.6	7.23	7.88	5.72	37.76	22560	58312	35752	2.58	21750	42328	20578	1.94
Black gram (Rabi)	NFSM	Varietal & ICM	Demonstration of high yielding black gram variety with ICM practices	VBN-8	VBN-4	25	10	8.77	8.10	8.40	5.92	41.89	20750	54600	33850	2.63	19250	38480	19230	1.99
CFLD -Oilseeds																				
Groundnut (Kharif)	NMOOP	Varietal & ICM	Demonstration of high yielding Groundnut varieties with ICM practices	CO-7	TMV-7	25	10	16.2	13.29	14.99	9.88	51.72	35685	95297	59612	2.67	34550	66328	31778	1.91
Castor (Kharif)	NMOOP	Varietal & ICM	Demonstration high yielding Groundnut varieties with ICM practices	YRCH-1	Local variety	25	10	15.5	13.6	14.62	9.35	56.36	24200	65764	41564	2.71	20600	42075	21475	2.04
Groundnut (Rabi)	NMOOP	Varietal & ICM	Demonstration of high yielding Groundnut varieties with ICM practices	Dharani	TMV-7	69	27.6	Trial is in progress												
Castor (Rabi)	NMOOP	Varietal & ICM	Demonstration high yielding Groundnut varieties with ICM practices	YRCH-1	Local variety	45	18	22.5	17.5	19.36	12.45	55.50	30533	83276	52743	2.72	27650	53535	25885	1.93
NICRA																				
Black gram	ICAR	ICM	Short duration var.	VBN-8	VBN-3	50	20	8.5	7.20	7.85	5.81	35.11	19850	51025	31175	2.57	18260	37765	19505	2.06

Small onion	NICRA	INM	Demontration of multigrain green manuring in small onion with ICM practice	Co4	Co4	66	26.4	124	107	121	105	15.24	77899	178643	100744	2.29	74312	147865	73553	1.99

4. TRAINING PROGRAMMES

4.1. 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										
Resource Conservation Technologies	2	19	7	26	2	0	2	21	7	28
Cropping Systems	1	2	0	2	0	0	0	2	0	2
Crop Diversification	1	2	2	4	0	0	0	2	2	4
Integrated Farming	1	12	3	15	3	1	4	15	4	19
Micro Irrigation/irrigation	1	15	1	16	6	0	6	21	1	22
Seed production	1	6	2	8	0	1	1	6	3	9
Nursery management	0	0	0	0	0	0	0	0	0	0
Integrated Crop Management	2	28	9	37	8	4	12	36	13	49
Soil & water conservatioin	0	0	0	0	0	0	0	0	0	0
Integrated nutrient management	0	0	0	0	0	0	0	0	0	0
Production of organic inputs	1	15	2	17	6	2	8	21	4	25
Others (pl specify)										
Total	**10**	**99**	**26**	**125**	**25**	**8**	**33**	**124**	**34**	**158**
II Horticulture										
a) Vegetable Crops										
Production of low value and high valume crops	2	24	5	29	2	0	2	26	5	31
Off-season vegetables										
Nursery raising										
Exotic vegetables										
Export potential vegetables										
Grading and standardization										
Protective cultivation										
Organic vegetable cultivation techniques	1	36	0	36	4	0	4	40	0	40
Total (a)	**3**	**60**	**5**	**65**	**6**	**0**	**6**	**66**	**5**	**71**
b) Fruits										
Training and Pruning	1	22	3	25	4	3	7	26	6	32
Layout and Management of Orchards										
Cultivation of Fruit	2	25	1	26	2	0	2	27	1	28
Management of young plants/orchards										
Rejuvenation of old orchards										
Export potential fruits										
Micro irrigation systems of orchards										
Plant propagation techniques										
Others (pl specify)										
Total (b)	**3**	**47**	**4**	**51**	**6**	**3**	**9**	**53**	**7**	**60**
c) Ornamental Plants										
Nursery Management										
Management of potted plants										
Export potential of ornamental plants										
Propagation techniques of Ornamental Plants										
Others (pl specify)	1	15	4	19	3	0	3	18	4	22
Total (c)	**1**	**15**	**4**	**19**	**3**	**0**	**3**	**18**	**4**	**22**
d) Plantation crops										
Production and Management technology										

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Processing and value addition										
Others (pl specify)										
Total (d)										
e) Tuber crops										
Production and Management technology	2	74	28	102	14	1	15	88	29	117
Processing and value addition										
Others (pl specify)										
Total (e)	**2**	**74**	**28**	**102**	**14**	**1**	**15**	**88**	**29**	**117**
f) Spices										
Production and Management technology										
Processing and value addition										
Others (pl specify)										
Total (f)										
g) Medicinal and Aromatic Plants										
Nursery management										
Production and management technology										
Post harvest technology and value addition										
Others (pl specify)										
Total (g)										
GT (a-g)	**9**	**196**	**41**	**237**	**29**	**4**	**33**	**225**	**45**	**270**
III Soil Health and Fertility Management										
Soil fertility management	1	82	53	135	30	15	45	112	68	180
Integrated water management	0	0	0	0	0	0	0	0	0	0
Integrated Nutrient Management	2	33	0	33	2	0	2	35	0	35
Production and use of organic inputs	3	38	7	45	10	0	10	48	7	55
Management of Problematic soils	1	3	0	3	0	0	0	3	0	3
Micro nutrient deficiency in crops	1	12	0	12	0	2	2	12	2	14
Nutrient Use Efficiency	0	0	0	0	0	0	0	0	0	0
Balance use of fertilizers	0	0	0	0	0	0	0	0	0	0
Soil and Water Testing	1	35	21	56	1	3	4	36	24	60
Others (pl specify)										
Total	**9**	**203**	**81**	**284**	**43**	**20**	**63**	**246**	**101**	**347**
IV Livestock Production and Management										
Dairy Management	2	17	0	17	11	3	14	28	3	31
Poultry Management	4	153	16	169	25	4	29	178	20	198
Piggery Management	1	23	1	24	6	0	6	29	1	30
Rabbit Management	1	15	1	16	0	0	0	15	1	16
Animal Nutrition Management	1	13	1	14	1	0	1	14	1	15
Disease Management	0	0	0	0	0	0	0	0	0	0
Feed & fodder technology	2	56	2	58	21	0	21	77	2	79
Production of quality animal products	0	0	0	0	0	0	0	0	0	0
Others (Goat rearing and Capacity building programme on Disaster management	5	93	21	114	40	10	50	133	31	164
Total	**16**	**370**	**42**	**412**	**104**	**17**	**121**	**474**	**59**	**533**
V Home Science/Women empowerment										
Household food security by kitchen gardening and										

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
nutrition gardening										
Design and development of low/minimum cost diet										
Designing and development for high nutrient efficiency diet										
Minimization of nutrient loss in processing										
Processing and cooking										
Gender mainstreaming through SHGs										
Storage loss minimization techniques										
Value addition										
Women empowerment										
Location specific drudgery reduction technologies										
Rural Crafts										
Women and child care										
Others (pl specify)										
Total										
VI Agril. Engineering										
Farm Machinary and its maintenance										
Installation and maintenance of micro irrigation systems										
Use of Plastics in farming practices										
Production of small tools and implements										
Repair and maintenance of farm machinery and implements										
Small scale processing and value addition										
Post Harvest Technology										
Others (pl specify)										
Total										
VII Plant Protection										
Integrated Pest Management	3	16	3	19	1	0	1	17	3	20
Integrated Disease Management	1	4	6	10	0	0	0	4	6	10
Bio-control of pests and diseases	0	0	0	0	0	0	0	0	0	0
Production of bio control agents and bio pesticides	1	29	1	30	2	1	3	31	2	33
IPDM in Tomato, Bhendi,Chilli and Brinjal	1	11	3	14	2	0	2	13	3	16
Total	**6**	**60**	**13**	**73**	**5**	**1**	**6**	**65**	**14**	**79**
VIII Fisheries										
Integrated fish farming	2	24	35	59	6	10	16	30	45	75
Carp breeding and hatchery management	1	12	2	14	2	1	3	14	3	17
Carp fry and fingerling rearing	1	12	0	12	6	3	9	18	3	21
Composite fish culture	3	27	8	35	11	3	14	38	11	49
Hatchery management and culture of freshwater prawn	0	0	0	0	0	0	0	0	0	0
Breeding and culture of ornamental fishes	1	13	2	15	5	2	7	18	4	22
Portable plastic carp hatchery										
Pen culture of fish and prawn										

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Shrimp farming										
Edible oyster farming										
Pearl culture										
Fish processing and value addition	1	13	2	15	0	2	2	13	4	17
Others (pl specify)	5	48	14	62	21	7	28	69	21	90
Total	**14**	**149**	**63**	**212**	**51**	**28**	**79**	**200**	**91**	**291**
IX Production of Inputs at site										
Seed Production										
Planting material production										
Bio-agents production										
Bio-pesticides production										
Bio-fertilizer production										
Vermi-compost production	1	10	7	17	0	0	0	10	7	17
Organic manures production										
Production of fry and fingerlings										
Production of Bee-colonies and wax sheets										
Small tools and implements										
Production of livestock feed and fodder										
Production of Fish feed										
Mushroom Production	2	62	19	81	13	16	29	75	35	110
Apiculture										
Others (pl specify)										
Total	**3**	**72**	**26**	**98**	**13**	**16**	**29**	**85**	**42**	**127**
X Capacity Building and Group Dynamics										
Leadership development										
Group dynamics										
Formation and Management of SHGs										
Mobilization of social capital										
Entrepreneurial development of farmers/youths										
WTO and IPR issues										
Others (pl specify)										
Total										
XI Agro-forestry										
Production technologies										
Nursery management										
Integrated Farming Systems										
Others (pl specify)										
Total										
GRAND TOTAL	**67**	**1149**	**292**	**1441**	**270**	**94**	**364**	**1419**	**386**	**1805**

4.2 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										
Weed Management										
Resource Conservation Technologies	1	49	11	60	0	0	0	49	11	60
Cropping Systems	1	32	13	45	0	0	0	32	13	45
Crop Diversification	1	41	9	50	0	0	0	41	9	50
Integrated Farming										
Micro Irrigation/irrigation										

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Seed production	1	10	10	20	5	0	5	15	10	25
Nursery management										
Integrated Crop Management	3	60	17	77	22	14	36	82	31	113
Soil & water conservatioin										
Integrated nutrient management										
Production of organic inputs										
Others (pl specify)										
Total	**7**	**192**	**60**	**252**	**27**	**14**	**41**	**219**	**74**	**293**
II Horticulture										
a) Vegetable Crops										
Production of low value and high valume crops	1	24	4	28	0	0	0	24	4	28
Off-season vegetables										
Nursery raising										
Exotic vegetables										
Export potential vegetables										
Grading and standardization										
Protective cultivation										
Others (pl specify)										
Total (a)	**1**	**24**	**4**	**28**	**0**	**0**	**0**	**24**	**4**	**28**
b) Fruits										
Training and Pruning										
Layout and Management of Orchards										
Cultivation of Fruit	1	0	0	0	3	7	10	3	7	10
Management of young plants/orchards										
Rejuvenation of old orchards										
Export potential fruits										
Micro irrigation systems of orchards										
Plant propagation techniques										
Others (pl specify)										
Total (b)	**1**	**0**	**0**	**0**	**3**	**7**	**10**	**3**	**7**	**10**
c) Ornamental Plants										
Nursery Management										
Management of potted plants										
Export potential of ornamental plants										
Propagation techniques of Ornamental Plants										
Cultivation of commercial flower crops	1	11	14	25	2	3	5	13	17	30
Total (c)	**1**	**11**	**14**	**25**	**2**	**3**	**5**	**13**	**17**	**30**
d) Plantation crops										
Production and Management technology										
Processing and value addition										
Others (pl specify)										
Total (d)										
e) Tuber crops										
Production and Management technology	1	7	0	7	7	25	32	14	25	39
Processing and value addition										
Others (pl specify)										
Total (e)	**1**	**7**	**0**	**7**	**7**	**25**	**32**	**14**	**25**	**39**
f) Spices										
Production and Management technology	1	0	0	0	10	3	13	10	3	13
Processing and value addition										

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Organic farming practices in spices under PKVY	3	0	0	0	53	8	61	53	8	61
Total (f)	**4**	**0**	**0**	**0**	**63**	**11**	**74**	**63**	**11**	**74**
g) Medicinal and Aromatic Plants										
Nursery management										
Production and management technology										
Post harvest technology and value addition										
Others (pl specify)										
Total (g)										
GT (a-g)	**8**	**42**	**18**	**60**	**75**	**46**	**121**	**117**	**64**	**181**
III Soil Health and Fertility Management										
Soil fertility management	1	22	8	30	3	3	6	25	11	36
Integrated water management										
Integrated Nutrient Management										
Production and use of organic inputs	3	23	1	24	15	13	28	38	14	52
Management of Problematic soils										
Micro nutrient deficiency in crops										
Nutrient Use Efficiency										
Balance use of fertilizers										
Soil and Water Testing	2	0	0	0	26	22	48	26	22	48
Others (pl specify)										
Total	**6**	**45**	**9**	**54**	**44**	**38**	**82**	**89**	**47**	**136**
IV Livestock Production and Management										
Dairy Management	3	0	75	75	0	83	83	0	158	158
Poultry Management										
Piggery Management										
Rabbit Management										
Animal Nutrition Management	2	19	3	22	0	0	0	19	3	22
Disease Management										
Feed & fodder technology	1	0	0	0	0	20	20	0	20	20
Production of quality animal products										
Others (pl specify)										
Total	**6**	**19**	**78**	**97**	**0**	**103**	**103**	**19**	**181**	**200**
V Home Science/Women empowerment										
Household food security by kitchen gardening and nutrition gardening										
Design and development of low/minimum cost diet										
Designing and development for high nutrient efficiency diet										
Minimization of nutrient loss in processing										
Processing and cooking										
Gender mainstreaming through SHGs										
Storage loss minimization techniques										
Value addition										

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Women empowerment										
Location specific drudgery reduction technologies										
Rural Crafts										
Women and child care										
Others (pl specify)										
Total										
VI Agril. Engineering										
Farm Machinary and its maintenance										
Installation and maintenance of micro irrigation systems										
Use of Plastics in farming practices										
Production of small tools and implements										
Repair and maintenance of farm machinery and implements										
Small scale processing and value addition										
Post Harvest Technology										
Others (pl specify)										
Total										
VII Plant Protection										
Integrated Pest Management	1	15	0	15	0	0	0	15	0	15
Integrated Disease Management										
Bio-control of pests and diseases										
Production of bio control agents and bio pesticides	1	0	0	0	15	6	21	15	6	21
Others (pl specify)										
Total	**2**	**15**	**0**	**15**	**15**	**6**	**21**	**30**	**6**	**36**
VIII Fisheries										
Integrated fish farming	1	19	11	30	0	0	0	19	11	30
Carp breeding and hatchery management										
Carp fry and fingerling rearing										
Composite fish culture	1	12	8	20	0	0	0	12	8	20
Hatchery management and culture of freshwater prawn										
Breeding and culture of ornamental fishes										
Portable plastic carp hatchery										
Pen culture of fish and prawn										
Shrimp farming										
Edible oyster farming										
Pearl culture										
Fish processing and value addition	1	13	7	20	0	0	0	13	7	20
Others (pl specify)	2	24	14	38	0	0	0	24	14	38
Total	**5**	**68**	**40**	**108**	**0**	**0**	**0**	**68**	**40**	**108**
IX Production of Inputs at site										
Seed Production										
Planting material production										
Bio-agents production										
Bio-pesticides production										
Bio-fertilizer production										
Vermi-compost production	1	0	0	0	0	25	25	0	25	25

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Organic manures production										
Production of fry and fingerlings										
Production of Bee-colonies and wax sheets										
Small tools and implements										
Production of livestock feed and fodder										
Production of Fish feed										
Mushroom Production	1	30	12	42	0	0	0	30	12	42
Apiculture										
Others (pl specify)										
Total	**2**	**30**	**12**	**42**	**0**	**25**	**25**	**30**	**37**	**67**
X Capacity Building and Group Dynamics										
Leadership development										
Group dynamics										
Formation and Management of SHGs										
Mobilization of social capital										
Entrepreneurial development of farmers/youths										
WTO and IPR issues										
Others (pl specify)										
Total										
XI Agro-forestry										
Production technologies										
Nursery management										
Integrated Farming Systems										
Others (pl specify)										
Total										
GRAND TOTAL	**36**	**411**	**217**	**628**	**161**	**232**	**393**	**572**	**449**	**1021**

4.3 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										
Resource Conservation Technologies	3	68	18	86	2	0	2	70	18	88
Cropping Systems	2	34	13	47	0	0	0	34	13	47
Crop Diversification	2	43	11	54	0	0	0	43	11	54
Integrated Farming	1	12	3	15	3	1	4	15	4	19
Micro Irrigation/irrigation	1	15	1	16	6	0	6	21	1	22
Seed production	2	16	12	28	5	1	1	21	13	34
Nursery management	0	0	0	0	0	0	0	0	0	0
Integrated Crop Management	5	88	26	114	30	18	48	118	44	162
Soil & water conservation	0	0	0	0	0	0	0	0	0	0
Integrated nutrient management	0	0	0	0	0	0	0	0	0	0
Production of organic inputs	1	15	2	17	6	2	8	21	4	25
Others (pl specify)										
Total	**17**	**291**	**86**	**377**	**52**	**22**	**74**	**343**	**108**	**451**
II Horticulture										
a) Vegetable Crops										
Production of low value and high valume crops	3	48	9	57	2	0	2	50	9	59

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Off-season vegetables										
Nursery raising										
Exotic vegetables										
Export potential vegetables										
Grading and standardization										
Protective cultivation										
Others (pl specify)	1	36	0	36	4	0	4	40	0	40
Total (a)	**4**	**84**	**9**	**93**	**6**	**0**	**6**	**90**	**9**	**99**
b) Fruits										
Training and Pruning	1	22	3	25	4	3	7	26	6	32
Layout and Management of Orchards										
Cultivation of Fruit	3	25	1	26	5	7	12	30	8	38
Management of young plants/orchards										
Rejuvenation of old orchards										
Export potential fruits										
Micro irrigation systems of orchards										
Plant propagation techniques										
Others (pl specify)										
Total (b)	**4**	**47**	**4**	**51**	**9**	**10**	**19**	**56**	**14**	**70**
c) Ornamental Plants										
Nursery Management										
Management of potted plants										
Export potential of ornamental plants										
Propagation techniques of Ornamental Plants										
Cultivation of commercial flower crops	2	26	18	44	5	3	8	31	21	52
Total (c)	**2**	**26**	**18**	**44**	**5**	**3**	**8**	**31**	**21**	**52**
d) Plantation crops										
Production and Management technology										
Processing and value addition										
Others (pl specify)										
Total (d)										
e) Tuber crops										
Production and Management technology	3	81	28	109	21	26	47	102	54	156
Processing and value addition										
Others (pl specify)										
Total (e)	**3**	**81**	**28**	**109**	**21**	**26**	**47**	**102**	**54**	**156**
f) Spices										
Production and Management technology	1	0	0	0	10	3	13	10	3	13
Processing and value addition										
Others (pl specify)	3	0	0	0	53	8	61	53	8	61
Total (f)	**4**	**0**	**0**	**0**	**63**	**11**	**74**	**63**	**11**	**74**
g) Medicinal and Aromatic Plants										
Nursery management										
Production and management technology										
Post harvest technology and value addition										
Others (pl specify)										
Total (g)										
GT (a-g)	**17**	**238**	**59**	**297**	**104**	**50**	**154**	**342**	**109**	**451**
III Soil Health and Fertility										

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Management										
Soil fertility management	2	104	61	165	33	18	51	137	79	216
Integrated water management	0	0	0	0	0	0	0	0	0	0
Integrated Nutrient Management	2	33	0	33	2	0	2	35	0	35
Production and use of organic inputs	6	61	8	69	25	13	38	86	21	107
Management of Problematic soils	1	3	0	3	0	0	0	3	0	3
Micro nutrient deficiency in crops	1	12	0	12	0	2	2	12	2	14
Nutrient Use Efficiency	0	0	0	0	0	0	0	0	0	0
Balance use of fertilizers	0	0	0	0	0	0	0	0	0	0
Soil and Water Testing	3	35	21	56	27	25	52	62	46	108
Others (pl specify)										
Total	**15**	**248**	**90**	**338**	**87**	**58**	**145**	**335**	**148**	**483**
IV Livestock Production and Management										
Dairy Management	5	17	75	92	11	86	97	28	161	189
Poultry Management	4	153	16	169	25	4	29	178	20	198
Piggery Management	1	23	1	24	6	0	6	29	1	30
Rabbit Management	1	15	1	16	0	0	0	15	1	16
Animal Nutrition Management	3	32	4	36	1	0	1	33	4	37
Disease Management	0	0	0	0	0	0	0	0	0	0
Feed & fodder technology	3	56	2	58	21	20	41	77	22	99
Production of quality animal products	0	0	0	0	0	0	0	0	0	0
Others (pl specify)	5	93	21	114	40	10	50	133	31	164
Total	**22**	**389**	**120**	**509**	**104**	**120**	**224**	**493**	**240**	**733**
V Home Science/Women empowerment										
Household food security by kitchen gardening and nutrition gardening										
Design and development of low/minimum cost diet										
Designing and development for high nutrient efficiency diet										
Minimization of nutrient loss in processing										
Processing and cooking										
Gender mainstreaming through SHGs										
Storage loss minimization techniques										
Value addition										
Women empowerment										
Location specific drudgery reduction technologies										
Rural Crafts										
Women and child care										
Others (pl specify)										
Total										
VI Agril. Engineering										
Farm Machinary and its maintenance										
Installation and maintenance of micro irrigation systems										
Use of Plastics in farming practices										

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Production of small tools and implements										
Repair and maintenance of farm machinery and implements										
Small scale processing and value addition										
Post Harvest Technology										
Others (pl specify)										
Total										
VII Plant Protection										
Integrated Pest Management	4	31	3	34	1	0	1	32	3	35
Integrated Disease Management	1	4	6	10	0	0	0	4	6	10
Bio-control of pests and diseases	0	0	0	0	0	0	0	0	0	0
Production of bio control agents and bio pesticides	2	29	1	30	17	7	24	46	8	54
Others (pl specify)	1	11	3	14	2	0		13	3	16
Total	**8**	**75**	**13**	**88**	**20**	**7**	**27**	**95**	**20**	**115**
VIII Fisheries										
Integrated fish farming	2	24	35	59	6	10	16	30	45	75
Carp breeding and hatchery management	1	12	2	14	2	1	3	14	3	17
Carp fry and fingerling rearing	1	12	0	12	6	3	9	18	3	21
Composite fish culture	4	39	16	55	11	3	14	50	19	69
Hatchery management and culture of freshwater prawn	0	0	0	0	0	0	0	0	0	0
Breeding and culture of ornamental fishes	1	13	2	15	5	2	7	18	4	22
Portable plastic carp hatchery										
Pen culture of fish and prawn										
Shrimp farming										
Edible oyster farming										
Pearl culture										
Fish processing and value addition	2	26	9	35	0	2	2	26	11	37
Others (pl specify)	7	72	28	100	21	7	28	93	35	128
Total	**19**	**217**	**103**	**320**	**51**	**28**	**79**	**268**	**131**	**399**
IX Production of Inputs at site										
Seed Production										
Planting material production										
Bio-agents production										
Bio-pesticides production										
Bio-fertilizer production										
Vermi-compost production	2	10	7	17	0	25	25	10	32	42
Organic manures production										
Production of fry and fingerlings										
Production of Bee-colonies and wax sheets										
Small tools and implements										
Production of livestock feed and fodder										
Production of Fish feed										
Mushroom Production	3	92	31	123	13	16	29	105	47	152
Apiculture										
Others (pl specify)										
Total	**5**	**102**	**38**	**140**	**13**	**41**	**54**	**115**	**79**	**194**
X Capacity Building and										

Thematic area	No. of courses	Participants								
		Others			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Group Dynamics										
Leadership development										
Group dynamics										
Formation and Management of SHGs										
Mobilization of social capital										
Entrepreneurial development of farmers/youths										
WTO and IPR issues										
Others (pl specify)										
Total										
XI Agro-forestry										
Production technologies										
Nursery management										
Integrated Farming Systems										
Others (pl specify)										
Total										
GRAND TOTAL	**103**	**1560**	**509**	**2069**	**431**	**326**	**757**	**1991**	**835**	**2826**

4.4 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										
Training and pruning of orchards										
Protected cultivation of vegetable crops										
Commercial fruit production										
Integrated farming										
Seed production										
Production of organic inputs	1	16	1	17	2	0	2	18	1	19
Planting material production										
Vermi-culture										
Mushroom Production										
Bee-keeping										
Sericulture										
Repair and maintenance of farm machinery and implements										
Value addition										
Small scale processing										
Post Harvest Technology										
Tailoring and Stitching										
Rural Crafts										
Production of quality animal products										
Dairying										
Sheep and goat rearing										
Quail farming										
Piggery										
Rabbit farming										
Poultry production	1	21	4	25	2	1	3	23	5	28
Ornamental fisheries										
Composite fish culture	2	38	2	40	15	7	22	53	9	62
Freshwater prawn culture										
Shrimp farming										

Pearl culture										
Cold water fisheries										
Fish harvest and processing technology										
Fry and fingerling rearing										
Any other - Soil and Water Testing Lab Assistant	1	5	6	11	2	7	9	7	13	20
Murrel fish	1	12	8	20	9	2	11	21	10	31
GIFT Tilapia fish culture	2	15	9	24	11	4	15	26	13	39
Recirculatory aquaculture systemsAny other	1	13	0	13	4	0	4	17	0	17
TOTAL	**9**	**120**	**30**	**150**	**45**	**21**	**66**	**165**	**51**	**216**

4.5 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										
Training and pruning of orchards										
Protected cultivation of vegetable crops										
Commercial fruit production										
Integrated farming										
Seed production										
Production of organic inputs	1	10	7	17	0	0	0	10	7	17
Planting material production										
Vermi-culture										
Mushroom Production										
Bee-keeping										
Sericulture										
Repair and maintenance of farm machinery and implements										
Value addition										
Small scale processing										
Post Harvest Technology										
Tailoring and Stitching										
Rural Crafts										
Production of quality animal products										
Dairying										
Sheep and goat rearing										
Quail farming										
Piggery										
Rabbit farming										
Poultry production										
Ornamental fisheries										
Composite fish culture										
Freshwater prawn culture										
Shrimp farming										
Pearl culture										
Cold water fisheries										
Fish harvest and processing technology	3	52	19	71	31	7	38	83	26	109
Fry and fingerling rearing										
Any other (pl.specify)- Nutrigarden to KGBV school students	2	0	0	0	0	88	88	0	88	88
Recirculatory aquaculture systems	2	55	17	72	48	7	55	103	24	127
TOTAL	**8**	**117**	**43**	**160**	**79**	**102**	**181**	**196**	**145**	**341**

4.6 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										
Training and pruning of orchards										
Protected cultivation of vegetable crops										
Commercial fruit production										
Integrated farming										
Seed production										
Production of organic inputs	2	26	8	34	2	0	2	28	8	36
Planting material production										
Vermi-culture										
Mushroom Production										
Bee-keeping										
Sericulture										
Repair and maintenance of farm machinery and implements										
Value addition										
Small scale processing										
Post Harvest Technology										
Tailoring and Stitching										
Rural Crafts										
Production of quality animal products										
Dairying										
Sheep and goat rearing										
Quail farming										
Piggery										
Rabbit farming										
Poultry production	1	21	4	25	2	1	3	23	5	28
Ornamental fisheries										
Composite fish culture	2	38	2	40	15	7	22	53	9	62
Freshwater prawn culture										
Shrimp farming										
Pearl culture										
Cold water fisheries										
Fish harvest and processing technology	3	52	19	71	31	7	38	83	26	109
Fry and fingerling rearing										
Any other - Soil and Water Testing Lab Assistant	1	5	6	11	2	7	9	7	13	20
Murrel fish	1	12	8	20	9	2	11	21	10	31
GIFT Tilapia fish culture	2	15	9	24	11	4	15	26	13	39
Recirculatory aquaculture systemsAny other	3	68	17	85	52	7	59	120	24	144
Nutrigarden to KGBV school students	2	0	0	0	0	88	88	0	88	88
TOTAL	**17**	**237**	**73**	**310**	**124**	**123**	**247**	**361**	**196**	**557**

4.7 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	3	87	23	110	10	4	14	97	27	124
Integrated Pest Management										
Integrated Nutrient management										
Rejuvenation of old orchards										
Protected cultivation technology										
Production and use of organic inputs										
Care and maintenance of farm machinery and implements										
Gender mainstreaming through SHGs										
Formation and Management of SHGs										
Women and Child care										
Low cost and nutrient efficient diet designing										
Group Dynamics and farmers organization										
Information networking among farmers										
Capacity building for ICT application										
Management in farm animals	1	6	0	6	0	0	0	6	0	6
Livestock feed and fodder production										
Household food security										
Any other (pl.specify)- Hydroponic fodder production and role of quality water in hydroponic fodder production	4	81	27	108	17	4	21	98	31	129
Nutritious fodder production techniques to NDDB secretaries,VAS and AO,Maladives	3	25	0	25	7	0	7	32	0	32
Recent production and post-harvest management practices in small onion	1	18	4	22	1	0	1	19	4	23
Rainfed fruit crops cultivation techniques and composting techniques for AOs and HOs under MSDA on Dryland IFS	1	12	6	18	7	5	12	19	11	30
TOTAL	**13**	**229**	**60**	**289**	**42**	**13**	**55**	**271**	**73**	**344**

4.8 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										

Integrated Pest Management	4	156	77	233	31	14	45	187	91	278
Integrated Nutrient management										
Rejuvenation of old orchards										
Protected cultivation technology										
Production and use of organic inputs										
Care and maintenance of farm machinery and implements										
Gender mainstreaming through SHGs										
Formation and Management of SHGs										
Women and Child care										
Low cost and nutrient efficient diet designing										
Group Dynamics and farmers organization										
Information networking among farmers										
Capacity building for ICT application										
Management in farm animals										
Livestock feed and fodder production										
Household food security										
Any other (pl.specify)- soil fertility management under drought condition MASDA capacity building programmes for district level extension officers	1	45	12	57	22	6	28	67	18	85
Soil health card based fertilizer application in Capacity building training to Agri input dealers	1	112	24	136	46	18	64	158	42	200
Integrated farming systems	1	6	2	8	2	1	3	8	3	11
Re-circulatory aquaculture systems	2	17	5	22	4	0	4	21	5	26
TOTAL	**9**	**336**	**120**	**456**	**105**	**39**	**144**	**441**	**159**	**600**

4.9 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	3	87	23	110	10	4	14	97	27	124
Integrated Pest Management	4	156	77	233	31	14	45	187	91	278
Integrated Nutrient management										
Rejuvenation of old orchards										
Protected cultivation technology										
Production and use of organic inputs										
Care and maintenance of farm machinery and implements										
Gender mainstreaming through SHGs										
Formation and Management of SHGs										
Women and Child care										

Low cost and nutrient efficient diet designing										
Group Dynamics and farmers organization										
Information networking among farmers										
Capacity building for ICT application										
Management in farm animals	1	6	0	6	0	0	0	6	0	6
Livestock feed and fodder production										
Household food security										
Any other (pl.specify)- Hydroponic fodder production and role of quality water in hydroponic fodder production	4	81	27	108	17	4	21	98	31	129
Nutritious fodder production techniques to NDDB secretaries,VAS and AO,Maladives	3	25	0	25	7	0	7	32	0	32
Recent production and post-harvest management practices in small onion	1	18	4	22	1	0	1	19	4	23
Rainfed fruit crops cultivation techniques and composting techniques for AOs and HOs under MSDA on Dryland IFS	1	12	6	18	7	5	12	19	11	30
Soil fertility management under drought condition MASDA capacity building programmes for district level extension officers	1	45	12	57	22	6	28	67	18	85
Soil health card based fertilizer application in Capacity building training to Agri input dealers	1	112	24	136	46	18	64	158	42	200
Integrated farming systems	1	6	2	8	2	1	3	8	3	11
Re-circulatory aquaculture systems	2	17	5	22	4	0	4	21	5	26
Total	**22**	**565**	**180**	**745**	**147**	**52**	**199**	**712**	**232**	**944**

4.10 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										
Increasing production and productivity of crops	2	70	13	83	26	6	32	96	19	115
Commercial production of vegetables										
Roof Top Vegetable Gardening	1	26	19	45	1	1	2	27	20	47
Bee Keeping	1	28	1	29	23	1	24	51	2	53
Total	**4**	**124**	**33**	**157**	**50**	**8**	**58**	**174**	**41**	**215**
Production and value addition										
Fruit Plants										
Ornamental plants										
Spices crops	4	0	0	0	84	4	88	84	4	88
Soil health and fertility management	3	166	107		19	23	42	185	130	315
Production of Inputs at site										
Methods of protective cultivation										
Others (pl. specify)- Vermicompost production	1	10	7	17	0	0	0	10	7	17
Mushroom cultivation	2	31	21	52	3	2	5	34	23	57
Total	**10**	**207**	**135**	**342**	**106**	**29**	**135**	**313**	**164**	**477**
Post harvest technology and value addition										
Processing and value addition										
Others (pl. specify)										
Total										
Farm machinery										
Farm machinery, tools and implements	1	87	13	100	13	1	14	100	14	114
Others (pl. specify)										
Total	**1**	**87**	**13**	**100**	**13**	**1**	**14**	**100**	**14**	**114**
Livestock and fisheries										
Livestock production and management	2	71	0	71	0	0	0	71	0	71
Animal Nutrition Management										
Animal Disease Management										
Fisheries Nutrition										
Fisheries Management	2	23	6	29	11	3	14	34	9	43
Others (pl. specify)- Green fodder production technology	1	29	0	29	14	0	14	43	0	43
Skill Training of Rural Youth (STRY) on Poultry Rearing Management	1	21	4	25	2	1	3	23	5	28
Recirculatory aquaculture systems	2	43	18	61	19	7	26	62	25	87
Nutritious fodder production	2	58	10	68	0	0	0	58	10	68
Total	**10**	**245**	**38**	**283**	**46**	**11**	**57**	**291**	**49**	**340**
Home Science										
Household nutritional security										
Economic empowerment of women										
Drudgery reduction of women										
Others (pl. specify)										
Total										
Agricultural Extension										
Capacity Building and Group Dynamics										
Others (pl. specify)										
Total										
GRAND TOTAL	**25**	**663**	**219**	**882**	**215**	**49**	**264**	**878**	**268**	**1146**

4.11 Name of sponsoring agencies involved

1. HEALDS NGO, Namakkal

2. Department of Horticulture, Namakkal

3. Paid Trainings

4. PKVY, ICAR, New Delhi
5. Reliance foundation, Namakkal
6. Muthayammal College of Arts and Science, Rasipuram, Namakkal
7. ATMA, Namakkal
8. Kandasamy Kandar College, P.Vellore,Namakkal
9.ICAR-Central Institute for Agricultural Engineering, Regional Centre, Coimbatore

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

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 floriculture										
Commercial fruit production										
Commercial vegetable production										
Integrated crop management										
Organic farming										
Others (pl. specify)- Livelihood support to Srilanka refugee farmers -SLRRRP –III	1	0	0	0	12	25	37	12	25	37
Organic Grower	1	13	6	19	1	0	1	14	6	20
Soil and Water Testing Lab Assistant	1	5	6	11	2	7	9	7	13	20
Total	**3**	**18**	**12**	**30**	**15**	**32**	**47**	**33**	**44**	**77**
Post harvest technology and value addition										
Value addition	1	5	16	21	0	2	2	5	18	23
Others (pl. specify)										
Total	**1**	**5**	**16**	**21**	**0**	**2**	**2**	**5**	**18**	**23**
Livestock and fisheries										
Dairy farming										
Composite fish culture										
Sheep and goat rearing										
Piggery										
Poultry farming										
Others (pl. specify)										
Total										
Income generation activities										
Vermicomposting										
Production of bio-agents, bio-pesticides,										
bio-fertilizers etc.										
Repair and maintenance of farm machinery										
and implements										
Rural Crafts										
Seed production										
Sericulture										
Mushroom cultivation										
Nursery, grafting etc.										
Tailoring, stitching, embroidery, dying etc.										
Agril. para-workers, para-vet training										
Others (pl. specify)										
Total										
Agricultural Extension										
Capacity building and group dynamics										
Others (pl. specify)										
Total										
Grand Total	**4**	**23**	**28**	**51**	**15**	**34**	**49**	**38**	**62**	**100**

5. EXTENSION PROGRAMMES

5.1 Extension programmes conducted

Activities	No. of programmes	No. of farmers	No. of Extension Personnel	TOTAL
Advisory Services	84	3796	335	4131
Diagnostic visits	54	103	55	158
Field Day	8	188	24	212
Group discussions	7	95	13	108
Kisan Ghosthi	0	0	0	0
Film Show	66	1666	174	1840
Self -help groups	1	30	3	33
Kisan Mela	6	6059	259	6318
Exhibition	12	19389	1497	20886
Scientists' visit to farmers field	97	660	81	741
Plant/animal health camps	3	245	16	261
Farm Science Club	0	0	0	0
Ex-trainees Sammelan	0	0	0	0
Farmers' seminar/workshop	2	368	47	415
Method Demonstrations	37	562	43	605
Celebration of important days	10	495	9	504
Special day celebration	7	571	12	583
Exposure visits	59	3222	106	3328
Others (pl. specify)- Lectures delivered	23	711	41	752
Awareness programme - Jal Shakti Abhiyan	28	3810	419	4229
Farmers group meetings	10	235	21	256
Soil Health Camp & Fertilizer Awareness programme	2	118	22	140
Total	**516**	**42323**	**3177**	**45500**

5.2 Details of other extension programmes

Particulars	Number
Electronic Media (CD./DVD)	3
Extension Literature	24
News paper coverage	32
Popular articles	11
Radio Talks	20
TV Talks	33
Animal health amps (Number of animals treated)	250
Others (pl. specify) – Farmers visit to KVK	10112
Lectures delivered as resource persons	93
Quarterly newsletter (English & Tamil)	4
Research articles	9
Success stories	8
Farm Radio School	1
Total	**10600**

6. MOBILE ADVISORY SERVICES

6.1. No of registered farmers on m-kisan portal:

6.2 Details of messages sent through m-kisan portal

Types of 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	--	--	--	--	48	164268	--	--	--	--	--	--	--	--
Voice only	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Voice & Text	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	48	164268	--	--	--	--	--	--	--	--

6.3 MOBILE ADVISORY SERVICES THROUGH OTHERS

No of registered farmers: 237

Types of 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	115	4716	15	399	48	3240	0	0	13	557	2	237	193	9149
Voice only	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Voice & Text	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	**115**	**4716**	**15**	**399**	**48**	**3240**	**0**	**0**	**13**	**557**	**2**	**237**	**193**	**9149**

7. DETAILS OF TECHNOLOGY WEEK CELEBRATIONS

Krishi Mela 2020

Types of Activities	No. of Activities	Number of Participants	Related crop/livestock technology
Gosthies	-	-	-
Lectures organised	7	455	Organic agriculture, emerging pest and diseases in coconut, Honey bee rearing, High yielding vegetable hybrids, Agro-forestry system, Livestock production system
Exhibition	1	2245	Exhibition on recent production technologies on crop, livestock, fisheries and organic farming
Film show	1	145	Emerging issues in Coconut pest management
Fair	-	-	-
Farm Visit	-	-	-
Diagnostic Practicals	-	-	-
Distribution of Literature (No.)	7	2250	Fodder production, Integrated farming system, Pulses production, Vegetable production technology, IPM in Cococnut, Bio pesticide preparation and application & Desi Bird rearing
Distribution of Seed (q)	10 kg	5	Castor seeds
Distribution of Planting materials (No.)	110	93	Red Jack grafts and Coconut seedlings var.WCT
Bio Product distribution (Kg)	50 kg	50	Bio inputs, Pest repellents and crop boosters
Bio Fertilizers (q)	-	-	-
Distribution of fingerlings	-	-	-
Distribution of Livestock specimen (No.)	-	-	-
Total number of farmers visited the technology week	1 (2 days)	2501	Sustainable production technologies relevant to Agriculture / Horticulture/Animal Science/Soil Science/Fishries

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

8.1 Production of seeds by the KVKs (quintal)

Enterprise	Name of crop	Variety	Seed produced		Seed supplied to farmers						Seed supplied to other agencies	
					Free seed			Priced seed				
			Quantity (q)	Value (Rs)	Quantity (q)	No of farmers	Value (Rs)	Quantity (q)	No of farmers	Value (Rs)	Quantity (q)	Value (Rs)
CEREALS	Wheat											
	Paddy											
	Maize											
	Sorghum (Jowar/Cholam/Jonna)											
	Pearl Millet (Bajra/Cumbu/Sajja)											
	Finger millet (Ragi)											
	Foxtail Millet (Korra/Thenai)											
	Barnyard Millet (Kuthiraivali/Udalu, Kodisama)											
	Kodo Millet (Varagu/Arikelu)											
	Little Millet (Samai/Samalu)											
	Proso Millet (Pani Varagu/variga)											
	Barley											

	Brown top millet											
	Total Cereals											
OIL SEEDS	Groundnut	CO-7, GJG-9	13.8	124245	0	0	0	13.8	22	124245	0	0
	Sunflower											
	Safflower											
	Sesame											
	Castor											
	Niger											
	Rapeseed & Mustard											
	Linseed											
	Soybean											
	Total Oil Seds		13.8	124245	0	0	0	13.8	22	124245	0	0
PULSES	Pigeon pea (Red Gram)											
	Chick pea (Bengal gram)											
	Green gram	CO-8	8	104000	0	0	0	4	54	52000	4	52000
	Black gram	VBN-6	3	39000	0	0	0	3	35	39000	0	0
	Cowpea											
	Horse gram											
	Lentil											
	Rajma											
	Field pea											
	Total Pulses		**11**	**1430000**	**0**	**0**	**0**	**7**	**89**	**91000**	**4**	**52000**
VEGATABLES	Bhendi (Okra/Ladies finger)	Arka Anamika	0.14	7000	0	0	0	0.14	67	7000	0	0
seeds	French bean	Arka Komal	0.09	4500	0	0	0	0.09	52	4500	0	0
	Radish	Pusa Chetki	0.12	6000	0	0	0	0.12	69	6000	0	0
	Onion	Co (On)5	0.142	35520	0	0	0	0.142	14	35520	0	0
	Chilli	K1	0.05	5500	0	0	0	0.05	63	5500	0	0
	Tomato	PKM 1	0.05	5500	0	0	0	0.05	71	5500	0	0
	Brinjal	CVK	0.04	4400	0	0	0	0.04	82	4400	0	0
	Gourds (snake, bottle, bitter, ribbed etc)	CO1,Arka Bahar,Co2 & PKM1	0.23	39100	0	0	0	0.23	289	39100	0	0
	Pumpkin		0	0	0	0	0	0	0	0	0	0
	Vegetable Pea		0	0	0	0	0	0	0	0	0	0
	Cluster bean	PNB	0.43	12900	0	0	0	0.43	219	12900	0	0
	Annual moringa	PKM1	0.11	33000	0	0	0	0.11	173	33000	0	0
	Lab lab	Co(GB) 14	0.12	5040	0	0	0	0.12	132	5040	0	0
	Amaranhus	All varieties	0.45	12355	0	0	0	0.45	240	12355	0	0
	Other Vegetables (Specify-seed only)								0	0	0	0
	Total Vegetables		**1.972**	**170815**	**0**	**0**	**0**	**1.972**	**1471**	**170815**	**0**	**0**
FRUITS												
seeds												

	Total Fruits											
FLOWERS												
seeds												
	Total Flowers											
SPICES	Turmeric rhizome											
seeds	Coriander											
	Garlic											
	Fenugreek											
	Total Spices											
FODDER	Fodder Sorghum	COFS29,31	87.8	3332158	0	0	0	87.8	6044	3332158	0	0
seeds	Fodder Cowpea	CO-8, CO-9	6.74	101122	0	0	0	6.74	155	101122	0	0
	Desmanthus/Hedge lucerne	CO-1	111.55	5791000	0	0	0	35.05	765	1927750	76.5	3863250
	Lucerne	CO-1	6.4	383670	0	0	0	6.4	711	383670	0	0
	Stylo	Hamata	6.64	265660	0	0	0	6.64	312	265660	0	0
	Alfalfa		0	0	0	0	0	0	0	0	0	0
	Berseem		0	0	0	0	0	0	0	0	0	0
	Agathi, Subabul	Local	11.49	474225	0	0	0	11.49	4195	474225	0	0
	Fodder Maize, Angan Grass	African Tall, Blue	26.35	753097	0	0	0	26.35	970	753097	0	0
	Total Fodder		**256.97**	**111100932**	**0**	**0**	**0**	**180.5**	**13152**	**7237682**	**76.5**	**3863250**
Special Planting	Potato											
Materials	Small onion bulb											
(Quintals)	Sugarcane setts (if sold by weight)											
	Total special planting materials											
GREEN	Dhaincha											
MANURE	Sesbania											
seeds	Sunnhemp											
	Other Green manure seeds											
	Total Green											

	Menure seeds											
COMMERCIAL	Cotton											
CROPS	Other Commercial Crop seeds											
seeds	Other Commercial Crop seeds											
	Total Commercial Crops											
	Grand Total of Seeds		**283.742**	**11538992**	**0**	**0**	**0**	**203.24**	**14734**	**7623742**	**80.5**	**3915250**

8.2 Production of planting materials by the KVKs (seedlings, cuttings. Slips in numbers)

Enterprise	**Name of crop**	**Variety**	**Planting material produced**		**Planting material supplied to farmers**						**Planting material supplied to other agencies**	
					Free supply			**Priced**				
			Quantity (Nos)	**Value (Rs)**	**Quantity (Nos)**	**No of farmers**	**Value (Rs)**	**Quantity (Nos)**	**No of farmers**	**Value (Rs)**	**Quantity (Nos)**	**Value (Rs)**
VEGATABLES	Brinjal seedlings											
	Chilli seedlings											
	Tomato seedlings											
	Cabbage seedlings											
	Cauliflower seedlings											
	Broccoli seedlings											
	Capsicum seedlings											
	Onion seedlings											
	Onion bulb (aggregatum)											
	Cucumber seedlings											
	Bottle gourd seedlings											
	Bitter gourd seedlings											
	Sponge gourd seedlings											
	Pumpkin seedlings											
	Knolkhole seedlings											
	Summer Squash seedlings											
	Marrow seedlings											
	Annual moringa	PKM1	41	820	0	0	0	41	15	820	0	0
	Total Vegetable planting materials											
FRUITS	Aonla	NA7	210	10500	0	0	0	210	53	10500	0	0
grafts	Litchi		0	0	0	0	0	0	0	0	0	0
seedlings and	Mango	Alphonso ,Banganapalli, Imam Pasand, Neelum	261	15660	0	0	0	261	149	15660	0	0

		and S.Bangalora										
cuttings	Papaya seedlings		0	0	0	0	0	0	0	0	0	0
	Guava	L49	270	13500	0	0	0	270	92	13500	0	0
	Jack fruit		0	0	0	0	0	0	0	0	0	0
	Beal	Local	93	6510	0	0	0	93	44	6510	0	0
	Citrus	Kodur 1	112	11200	0	0	0	112	133	11200	0	0
	Lemon	Balaji	427	52000	0	0	0	427	122	52000	0	0
	Mausammi		0	0	0	0	0	0	0	0	0	0
	Karonda		0	0	0	0	0	0	0	0	0	0
	Pomegranate	Bagawa	191	19100	0	0	0	191	57	19100	0	0
	Custard apple	Local	510	11635	0	0	0	510	231	11635	0	0
	Apple		0	0	0	0	0	0	0	0	0	0
	Ber		0	0	0	0	0	0	0	0	0	0
	Jamun	Gulab	112	11200	0	0	0	112	107	11200	0	0
	Pear		0	0	0	0	0	0	0	0	0	0
	Peach		0	0	0	0	0	0	0	0	0	0
	Kiwi		0	0	0	0	0	0	0	0	0	0
	Apricot		0	0	0	0	0	0	0	0	0	0
	Walnut		0	0	0	0	0	0	0	0	0	0
	Banana succers		0	0	0	0	0	0	0	0	0	0
	Banana seedlings		0	0	0	0	0	0	0	0	0	0
	Sapota	PKM1	86	6880	0	0	0	86	43	6880	0	0
	Sweet orange	Kodur 1	112	11200	0	0	0	112	70	11200	0	0
	Tamarind	PKM1	123	6150	0	0	0	123	76	6150	0	0
	Fig	Timla	13	1300	0	0	0	13	12	1300	0	0
	Total Fruit planting materials		**2520**	**176835**	**0**	**0**	**0**	**2520**	**1189**	**176835**	**0**	**0**
FLOWERS AND	Marigold											
ORNAMENTAL	Tube Rose (Rajnigandha)											
PLANTS	Chrysanthmum											
seedlings and	Rose											
cuttings	Hibiscus (Gudhal)											
	Crotan plant											
	Calandula (Pot marigold)											
	Vervina											
	Pendula											
	Baugain villia											
	Durenta Golden											
	Gladiolus											
	Harshingar											
	Glardia											
	Ficus benajamina											
	Red erration											

	Poppy											
	Sweet William											
	Chirayata											
	Ashok											
	Neerium	Pink	60	1470	0	0	0	60	35	1470	0	0
	Taberna	Double & single	32	1600	0	0	0	32	15	1600	0	0
	Total Flowers and Ornamental planting materials		**92**	**3070**	**0**	**0**	**0**	**92**	**50**	**3070**	**0**	**0**
MEDICINAL	Lemon Grass											
AND	Aswagandha											
AROMATIC	Satawar											
PLANTS	Mahogani											
seedlings and	Turmeric											
cuttings												
	Total medicinal and aromatic											
FORESTRY	Poplar											
AND	Arjun											
PLANTATION	Siris											
CROPS	Catechu											
seedlings and	Chironji											
cuttings	Mahua											
	Karanj											
	Neem											
	Teak											
	Eucalyptus											
	Saguan											
	Samel											
	Casuarina											
	Coconut seedlings	WCT	650	48750	0	0	0	650	37	48750	0	0
	Arecanut seedlings		0	0	0	0	0	0	0	0	0	0
	Kalyana murungai	Local	35	350	0	0	0	35	15	350	0	0
	Total forest and plantation crops		**685**	**49100**	**0**	**0**	**0**	**685**	**52**	**49100**	**0**	**0**
FODDER	Napier grass											
slips	Para grass											
	Super Napier grass											
	Sudax Chery											
	Cumbu Napier grass (Co 3, Co 4, Co 5 etc)	CO-4	98400	73800				98400	25	73800	0	0
	Other fodder plants (Specify)											
	Total Fodder crops		98400	73800	0	0	0	98400	25	73800	0	0
SPICES	Turmeric											

	Coriander											
	Garlic											
	Fenugreek											
	Other Fibre Crops (Specify - seed only)											
	Total Spices											
	Fodder Sorghum											
	Fodder Cowpea											
	Desmanthus/Hedge lucerne											
	Lucerne											
	Stylo											
	Alfalfa											
	Berseem											
	Other Fodder Seeds											
	Total Fodder											
GREEN	Dhaincha											
MANURE	Sesbania											
	Sunnhemp											
	Other Green manure seeds											
	Total Green Menure seeds											
Special Planting	Mushroom spawn											
Materials	Sugarcane setts (If sold by Numbers)											
sold by numbers	Other seed materials (sold by numbers)											
	Total special planting materials											
Any other planting material sold by numbers	Paddy seedlings											
	Any other (specify)											
	Total Commercial Crops											
	Grand Total of Seeds		**101738**	**302805**	**0**	**0**	**0**	**101738**	**1331**	**303625**	**0**	**0**

8.3 Production of Bio-Products

Category	**Name of the product**	**Commercial name (if any)**	**Bio-products produced**		**Bio-products supplied to farmers**						**bio-products supplied to other agencies**	
					Free distribution			**Priced**				
			Quantity (kg)	**Value (Rs)**	**Quantity (kgs)**	**No of farmers**	**Value (Rs)**	**Quantity (kgs)**	**No of farmers**	**Value (Rs)**	**Quantity (kgs)**	**Value (Rs)**
Bio-fertilizers	Rhyzobium											
	Azotobacter											

	Acetobacter											
	Azospirillum		235	12925	0	0	0	235	93	12925	0	0
	BGA											
	Azolla		125	8750	1	2	70	124	263	8680	0	0
	VAM		44	3240	0	0	0	44	35	3240	0	0
	Phosphate solubilizers		216	11880	0	0	0	216	80	11880	0	0
	Potassium Solubilizers											
	Sulphur Solubilizers											
	Waste decomposer	NCOF waste decomposer (Solid & Liquid)	317	13250	0	0	0	317	97	13250	0	0
	Bio composting culture											
	IIHR Arka Microbial Consortia (AMC)	IIHR All rounder	170	31450	0	0	0	170	43	31450	0	0
	Total bio-fertilizers		**1107**	**81495**	**1**	**2**	**70**	**1106**	**611**	**81425**	**0**	**0**
Bio-inputs	Panchakavya		500	50000	0	0	0	489.3	375	48925	0	0
	Vermicompost		2467	24670	0	0	0	2467	124	24670	0	0
	Earthworms for vermicompost	E.eug	115	46000	0	0	0	115	38	46000	0	0
	Compost	Enriched compost	150	3000	0	0	0	93	32	1860	0	0
	Other bio-inputs (specify)											
	Total bio-inputs		3232	123670	0	0	0	3164.3	569	121455	0	**0**
Bio-Pesticides for insect pests	*Beauveria bassiana*		45.5	12025	0	0	0	45.5	41	12025	0	0
	Trichoderma viridi		243.1	36465	0	0	0	243.1	275	36465	0	0
Fungal diseases	*Metarrhizium anisoplae*		55	14500	0	0	0	55	48	14500	0	0
Nematodes	*Psuedomonas*		203.6	30940	0	0	0	203.6	186	30940	0	0
	EPN											
	Trichogramma (Unit)											
	Insect Parasitoids (Specify)											
	Insect Parasitoids (Specify)											
	Insect Parasitoids (Specify)											
	Insect Parasitoids (Specify)											
	Insect Parasitoids (Specify)											
	Neem Soap											
	Pongamia Soap											
	Botanicals (Specify)											
Other	Neem oil		44.75	17900	0	0	0	44.75	38	17900	0	0

inputs	Pungam oil		14.75	2450	0	0	0	14.75	12	2450	0	0
	Trichoderma harzianum		139	27100	0	0	0	139	122	27100	0	0
	Ginger-Garlic solution		28	2800	0	0	0	28	25	2800	0	0
	Pest repellent		116	4640	0	0	0	116	102	4640	0	0
Crop booster	Arka Banana special		157	28260	0	0	0	157	112	28260	0	0
	Arka Vegetable special		114	20520	0	0	0	114	73	20520	0	0
	Arka Mango special		4	720	0	0	0	4	4	720	0	0
	Coconut tonic, Groundnut rich, Cotton plus, Sugarcane booster & Pulse wonder		509.9	138640	0	0	0	509.9	200	138640	0	0
	Groundnut, Cotton, Maize, coconut		400	39750	0	0	0	400	24	39750	0	0
	PPFM		60	22200	0	0	0	60	20	22200	0	0
MM mixture for livestock	TANUVAS Mineral mixture for cattle		3541	194755	0	0	0	3541	331	194755	0	0
	Mineralised salt block		1224	128520	0	0	0	1224	168	128520	0	0
	Total bio-pesticides		**6899.6**	**722185**	**0**	**0**	**0**	**6899.6**	**849**	**722185**	**0**	**0**
	Total bio-products		**11238.6**	**927350**	**1**	**2**	**70**	**11238.6**	**2029**	**927350**	**0**	**0**

8.4 Production of livestock materials

Category	Name of the livestock/fish/feed	Variety/improved species name/Commercial name (if any)	Production		Supplied to farmers						Supplied to other agencies	
					Free distribution			Priced				
			Quantity (No)	Value (Rs)	Quantity (No)	No of farmers	Value (Rs)	Quantity (No)	No of farmers	Value (Rs)	Quantity (No)	Value (Rs)
Dairy cattle	Cow	Jersey cross	10	204000	0	0	0	3	3	108000	0	0
	Cow											
	Cow Calf											
	Cow Calf											
	Bufallo											
	Bufallo											
	Bufallo calf											
	Bufallo calf											
	Other diary cattle (Specify)											
	Total Dairy Cattle		**10**	**204000**	**0**	**0**	**0**	**3**	**3**	**108000**	**0**	**0**
Goat and Sheep	Goat	Tellicherry cross	40	180000	0	0	0	13	4	46800	6	23400
	Goat											
	Goat											
	Sheep	Mecheri	9	40500	0	0	0	0	0	0	3	11700
	Sheep											
	Sheep											

	Lamb											
	Lamb											
	Other goat/sheep (Specify)											
	Total goat and sheep		**49**	**220500**	**0**	**0**	**0**	**13**	**4**	**46800**	**9**	**35100**
Poultry	Desi bird	Aseel cross, TANUVAS Aseel, Kadaknath	12874	772440	0	0	0	12874	253	772440	0	0
	Desi bird											
	Desi bird chicks	Vanaraja and Grama priya	5794	127468	0	0	0	5794	109	127468	0	0
	Desi bird chicks											
	Broiler											
	Layer											
	Dual purpose birds											
	Japanese Quail											
	Turkey											
	Emu											
	Ducks											
	Desi bird egg											
	Broiler hybrid egg											
	Layer egg (breeding)											
	Egg (Commercial)											
	Quail egg (breeding)											
	Quail egg (commercial)											
	Others under poultry (specify)											
	Total poultry		**18668**	**899908**	**0**	**0**	**0**	**18668**	**362**	**899908**	**0**	**0**
PIGGERY	*Pigs adults*	Large white yorkshire	2	17600	0	0	0	0	0	0	0	0
	Piglets											
	Pork											
	Others related to piggery)											
	Total Piggery		**2**	**17600**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
FISHERY	Fingerlings of Fish type (specify)	Catla	350000	192500	0	0	0	350000	17	192500	0	**0**
		Rohu	250000	137500	0	0	0	250000	12	137500	0	**0**
		Mrigal	150000	96000	0	0	0	150000	15	96000	0	**0**
		Common carp	250000	120000	0	0	0	250000	20	120000	0	**0**
		Tilapia	1500	45000	0	0	0	1500	3	45000	0	**0**
		Ornamental fish	1000	6500	0	0	0	1000	2	6500	0	**0**
	Fish meat (kg)											
	Total Fishery		**1002500**	**597500**	**0**	**0**	**0**	**1002500**	**69**	**597500**	**0**	**0**
	Grand Total Livestock and fishery		**1021229**	**1939508**				**1021184**	**438**	**1652208**	**9**	**35100**

9. DETAILS OF SOIL, WATER AND PLANT ANALYSIS

Samples/ SHC	No. of Samples		No. of Farmers	No. of Villages	Amount realized (Rs.)
	Using Mini Soil Testing Lab	Through Traditional Lab			
Soil samples	395	415	778	312	**138750**
Soil Health Cards (SHC)	395	415	778	312	

Samples	No.of Samples	No.of Farmers	No.of Villages	Amount realized (Rs.)
Water	311	306	256	28870
Plant	10	1	1	800
Total	**1131**	**1085**	**569**	**168420**

10. SCIENTIFIC ADVISORY COMMITTEE

Date of SAC meeting	Number of members attended
10.3.2020	60

11. PUBLICATIONS

Publications in journals

S. No	Authors	Year	Title	Journal
1	Akila,N. and N.Bharathi	2019	Farmers Field School - A sustainable Approach in Technology transfer and skill development of livestockfarmers	Indian Journal of Extension Education,20(1):5-8
2	Murugan,P.,P.Kumaravel and N.Akila	2019	Evaluation of profitable Integrated Farming System for Kanchipuram district	Compendium of International Conference on Role of Veterinary science in farmers livelihood by Naam Thamizhar Pathippagam. 1 (2019): 529-533
3	Murugan,P.,N.Akila and S.Vignesh	2019	Assessment of different paddy production system for new paddy variety CO-52 in Namakkal district	Compendium of International Conference on Role of Veterinary science in farmers livelihood by Naam Thamizhar Pathippagam. 1 (2019): 673-677
4	Kathirvelan,C.,D.Manimara	2019	Analysis of nitrate	Int. Journal Curr. Mic

	n, P.Vasanthakumar and M.R.Purushothaman		content in water samples collected from Karur districts associated with nitrate toxicity for dairy cattle – A Preliminary approach	and Appli. Sci.8(42): 2788-2792
5	Alagudurai,S and K.R. Pushpanathan	2019	Growth and yield perfomance of guinea grass COGG (3) in coconut graden for sustainable green fodder production	Trends in Bio science.11(47): 4375 - 4377
6	Abinaya,S., K.R. Saravanan, K.R. Pushpanathan and L. Muralikrishnan	2019	Studies on genetic variability in green gram (Vigna radiata.L)	Plant Archives 19(2): 2423-2425
7	Daisy,M and N. Thavaprakaash	2019	Yield performance of castorHybrid (YRCH - 1) to different crop geometry level under SCI practices	Chemistry science Review & letter P.No. 629-634
8	Daisy,M.,K.Senthil Kumar and B.Mohan	2019	Growth and yield attributes of Castor hybris YRCH1 under rainfed condition in Namakkal District	Compendium of International Conference on Role of Veterinary science in farmers livelihood by Naam Thamizhar Pathippagam. 1 (2019): 79-82
9	Abinaya,S., K.R. Saravanan.,P.Thangavel, R. Madhubala and K.R. Pushpanathan	2020	Studies and heterosis and combining ability analysis in Okra	Plant Archives,20(1): 1340-1342

Other publications

S.No	Item	Year	Authors	Title	Publisher
I 1	**Books**	2019	Vasan,P., T.Hariharan,. P.C. Sakthivel And M. R. Purusothaman	Animal Nutrition – 2nd Edition	VC&RI,Namakkal
2		2019	Vasan.,P and T. Hariharan	Climate resilient feeding management in small ruminants	
3		2020	Vasan.,P and T. Hariharan	Climate resilient feeding management in small ruminants (in Tamil)	
II 1	**Booklet**	2020	Sathya,S and N.Akila	Special programmes conducted by KVK,Namakkal from January 2019 to February 2020	KVK,Namakkal

III 1		2019	Murugan,P and N.Akila	Fall Armyworm management practices in Maize	KVK, Namakkal
2	**Book chapters**	2019	Pushpanathan,K.R	Performance of castor + onion intercropping in Drip fertigation system	Apple Academic Press, ISBN No. 13:978-1-77188-791-5
3		2019	Arachi,J.M.A.P., M.Pradhap and S.Paulpandi	Best Management Practices (BMPs) and sustainable aquaculture	CIBA,Chennai
IV 1		2019	Jawaharial , M., Ravi Kumar Theodore, N. Akila, T. Hariharan and M. Senthilkumar	Training manual for agricultural field officers of Maldives	TNAU, Coimbatore
2	**Training manuals**	2019	Paulpandi,S.,and A.Arulmozhi	Aquaatic Animal Disease,Health care and Management	VC &RI,Namakkal
3		2020	Sathya,S.and N.Akila	Analysis of Soil & water testing	KVK, Namakkal
4		2020	Sathya,S.and N.Akila	Soil fertility management practice	KVK, Namakkal
V 1		2019	Akila,N and K.Sathish Kumar	Mitigation strategies to sustain dairy production and productivity in changing climate of Namakkal District	Abstract published in Compendium on International seminar on Innovative Extension Management for uplifting livelihood of farmers-Status, Initiatives and way forward 2019.Pp.No.594
2		2019	Sharmila Bharathi C., B. Mohan and N.Akila	Women empowerment through additional crop cultivation – A climate resilient practice of Namakkal District	Abstract published in the International conference abstract book eSARD Pp.No.223
3		2019	Kathirvelan,C.,	Demonstration of mulberry leaves feeding on goats for better body weight gain	Abstract published in Compendium on International seminar on Innovative Extension Management for uplifting livelihood of farmers-Status, Initiatives and way forward 2019.Pp.No.573
4		2019	Kathirvelan,C.,	Demonstration on use of mastiguard in clean milk production and reduction in mastitis incidence	Abstract published in Compendium on International seminar on Innovative Extension Management for

	Research abstracts & Conference, proceeding papers				uplifting livelihood of farmers-Status, Initiatives and way forward 2019.Pp.No.574
5		2019	Jothilakshmi, M and N.Akila	Are extension approaches alone determining technological adoption? – Experiences in promotion of bag silage for small holder dairy production system in Namakkal District	Abstract published in Compendium on International seminar on Innovative Extension Management for uplifting livelihood of farmers-Status, Initiatives and way forward 2019.Pp.No.620
6		2019	Sathya,S.and N.Akila	Demonstration of banana-cowpea intercropping with ICM practice on soil fertility changes and yield of banana	Abstract published in Compendium on International seminar on Innovative Extension Management for uplifting livelihood of farmers-Status, Initiatives and way forward 2019.Pp.No.576-577
7		2020	Saravanan,KR., K.R. Pushpanathan, P. Karthikeyan, J.L. Joshi and S. Abinaya	Role of GMO'S in Assessing food security and nutritional security	Abstract published in compendium on International Conference on Food Health and Agriculture Innovation, 1:53
VI 1	**Popular articles**	2019	Murugan,P and N.Akila	Rainfed farming production technologies	Kalaikathir – Daily Tamil Newspaper
2		2019	Murugan,P and N.Akila	Maize fall armyworm management	Kalaikathir – Daily Tamil Newspaper
3		2019	Murugan,P and N.Akila	Contigent plan for Drought mitigation technologies	Kalaikathir – Daily Tamil Newspaper
4		2019	Sharmila Bharathi.C, B.Mohan and N.Akila	Thottakalai Payir Sagupadi Matrum Kalnadai Valarppu Sarntha Oruginantha pannayam – Success story	Book on Uzhavar Vazhviyalil Kalnadai Maruthuva Ariviyal ISBN : 978-93-88697-63-7 May 2019 Page No. 690-694
5		2020	Sharmila Bharathi,C.	Organic cultivation of crops associated with IFS farming - A farmer success story	Kalnadai Velanmai, Monthly Tamil Magazine, Feb 2020 pp,44-47
6		2020	Sathya,S.and N.Akila	Composting technologies	Kalaikathir – Daily Tamil Newspaper

					14.01.2020
7		2019	Paulpandi,S and N.Akila	Requirement of minerals in fresh water shrimp culture	Kalaikathir – Daily Tamil Newspaper
8		2019	Paulpandi,S and N.Akila	Composite fish culture	Kalaikathir – Daily Tamil Newspaper
9		2019	Paulpandi,S and N.Akila	Pangasius fish culture	Pachaiboomi
10		2019	Daisy , M., N.Akila., K.Senthil Kumar And M. Sakthi priya	Medicinal uses of Aavarai	Pachai Boomi P.No.44-45 January 2019
11		2019	Daisy , M.and N.Akila.,	Azolla cultivation in summer	Pachai Boomi P.No.79 May 2019
VII 1	**Technical bulletin/ Folders**	2019	Akila, N., C.Sharmila Bharathi, P.Murugan M.Jothilakshmi C.Kathirvelan K.R.Pushpanathan,S. Sathya,S.paulpandi and M.Daisy	Achievements of NICRA 2011-2019	KVK, Namakkal
VIII 1	**Reports**	2019	Murugan,P and N.Akila	KVK Annual report, 2018-19 Word & Excel	KVK, Namakkal
2		2019		Report on Cluster FLD on Rabi Oilseeds 2018-19	KVK, Namakkal
3		2019		Report on Cluster FLD on Kharif Pulses 2019-20	KVK, Namakkal
4		2019		Report on Cluster FLD on Rabi Pulses 2019-20	KVK, Namakkal
5		2019		Report on Cluster FLD on Kharif Oilseeds 2019-20	KVK, Namakkal
6		2019		Report on Workshop of Fall Armyworm management in Maize	KVK, Namakkal
7		2020	Murugan,P., K.R.Pushpanathan and N.Akila	Report on 13th Scientific Advisory Committee meeting	KVK, Namakkal
8		2019	Sharmila Bharathi,C and N.Akila	Haldhar Organic Farmer award Nomination report	KVK,Namakkal
9		2019	Sharmila Bharathi,C and N.Akila	Farm Innovation report for Farmer Science Congress	KVK,Namakkal
10		2019	Sharmila Bharathi,C , K.R.Pushpanathan and N.Akila	Quinquineal Review Report 2011 -2018	KVK,Namakkal
11		2019	Sharmila Bharathi,C and N.Akila	Shamatha Action plan	KVK,Namakkal
12		2019	Sharmila Bharathi,C and N.Akila	JSA Report	KVK,Namakkal

13		2020	Sharmila Bharathi,C and N.Akila	Proposal on Nutrigarden and RTG	KVK,Namakkal
		2020	Sharmila Bharathi,C and N.Akila	PKVY Report	KVK,Namakkal
14		2020	Sharmila Bharathi,C and N.Akila	ASCI – Bee Keeping training report	KVK,Namakkal
15		2019	Sathya.S. and N.Akila	Powerpont of Preacion plan, Action plan and ICAR and NICRA annual review	KVK, Namakkal
16		2020	Sathya.S. and N.Akila	Powerpoint of Scientific Advisory Committee meeting	KVK, Namakkal
17		2019	Sathya.S. and N.Akila	Fact sheet for 2018-19	KVK, Namakkal
18		2020	Sathya.S. and N.Akila	Fact sheet for five year achievement of KVK, Namakkal 2014-19	KVK, Namakkal
19		2019	Paulpandi,S and N.Akila	Report on Swatchhata Pakhwada Programme	KVK, Namakkal
IX 1		2019	Murugan,P and N.Akila	Green fodder production technologies	KVK, Namakkal
2		2019	Murugan,P and N.Akila	Multicut fodder sorghum (COFS-29) Production technology	KVK, Namakkal
3		2019	Murugan,P and N.Akila	Hedge Lucerne fodder production technology	KVK, Namakkal
4		2019	Sharmila Bharathi,C and N.Akila	Organic production techniques in Vegetable crops	KVK,Namakkal
5		2019	Sharmila Bharathi,C and N.Akila	ICM practices in Small onion	KVK,Namakkal
6	**Pamphlets**	2019	Sharmila Bharathi,C and N.Akila	IPDM practices in small onion	KVK,Namakkal
7		2019	Sharmila Bharathi,C and N.Akila	Roof Top Gardening techniques	KVK,Namakkal
8		2020	Pushpanathan, KR. and Akila, N.	Rugous whitefly in Coconut	KVK, Namakkal
9		2020	Pushpanathan,K.R., N. Akila and P. Murugan	Integrated pest and disease management in Sugarcane	KVK, Namakkal
10		2020	Pushpanathan,K.R., N. Akila and C. Sharmila bharathi	Integrated pest and disease management in Chilli	KVK, Namakkal
11		2020	Pushpanathan,K.R., N. Akila, S. Sathya and C. Paulpandi	Fall Army worm Managemnt in Maize crop	KVK, Namakkal

12		2019	Hariharan, T and N. Akila	Profitable Desi-chicken farming (in Tamil)	KVK, Namakkal
13		2020	Hariharan, T and N. Akila	Dairy Cattle management (in Tamil)	KVK, Namakkal
14		2020	Hariharan, T and N. Akila	Duck rearing (in Tamil)	KVK, Namakkal
15		2020	Hariharan, T and N. Akila	White pig farming (in Tamil)	KVK, Namakkal
16		2020	Hariharan, T and N. Akila	Goat farming (in Tamil)	KVK, Namakkal
17		2019	Sathya.S. and N.Akila	Importance of soil & water testing	KVK, Namakkal
18		2019	Sathya.S. and N.Akila	Soil fertility management under drought condition	KVK, Namakkal
19		2019	Sathya.S. and N.Akila	Importance of macro nutrients, their deficiency symptom and their corrective measures	KVK, Namakkal
20		2019	Sathya.S. and N.Akila	Importance of micro nutrients, their deficiency symptom and their corrective measures	KVK, Namakkal
21		2019	Sathya.S. and N.Akila	Role of micronutrient mixture for soil fertility improvement	KVK, Namakkal
22		2019	Sathya.S. and N.Akila	Plant residue composting	KVK, Namakkal
23		2019	Sathya.S. and N.Akila	Acheievement s in NICRA English	KVK, Namakkal
24		2020	Sathya.S. and N.Akila	Acheievement s in NICRA Tamil	KVK, Namakkal
25		2020	Akila, N., S. Sathya, C. Sharmila Bharathi, P. Murugan, K.R.Pushpanathan, T.Hariharan S. Paulpandi & M. Daisy	Activities of KVK, Namakkal	KVK, Namakkal
26	**Pamphlets**	2019	Paulpandi,S and N.Akila	Seabass culture technology	KVK, Namakkal
27		2019	Paulpandi,S and N.Akila	Ornamental fish culture	KVK, Namakkal
28		2019	Paulpandi,S and N.Akila	Shrimp Feed and Feeding management	KVK, Namakkal
29		2019	Paulpandi,S and N.Akila	Murrel fish culture	KVK, Namakkal
30		2019	Paulpandi,S and N.Akila	GIFT Tilapia pond based culture	KVK, Namakkal
31		2019	Paulpandi,S and N.Akila	Composite fish culture	KVK, Namakkal
32		2019	Paulpandi,S and N.Akila	Hedge Lucerne fodder production technology	KVK, Namakkal
33		2020	Paulpandi,S and N.Akila	Pangasius fish culture	KVK, Namakkal

34		2020	Paulpandi,S and N.Akila	Effect of Aqueous Minerals Supplementation on Growth and Survival of *Litopenaeus vannamei* in Low Salinity Water	KVK, Namakkal
X 1	**Flex & Posters**	2019	Akila,N	KVK Best practices for APR	KVK,Namakkal
2		2019	Akila,N	NICRA activities	KVK,Namakkal
3		2019	Murugan,Pand N.Akila	JSA Posters -6 Nos	KVK,Namakkal
4		2020	Paulpandi,S and N.Akila	Fish farming development in Aquaponic systems	KVK, Namakkal
5		2020	Paulpandi,S and N.Akila	Composting fish waste and seaweeds to produce a fertilizer for use in organic agriculture.	KVK, Namakkal
6		2020	Paulpandi,S and N.Akila	Fish Amino – A useful biological option	KVK, Namakkal
7		2020	K.R. Pushpanathan. and N.Akila	Mealy bug management in Tapioca (in Tamil) (6X4'size)	KVK, Namakkal
8		2020	K.R. Pushpanathan. and N.Akila	Sugarcane Internode borer and Top borer maangement (in Tamil) (6X4'size)	KVK, Namakkal
9		2020	K.R. Pushpanathan. and N.Akila	Integrated pest and disease management in small onion (in Tamil) (6X4'size)	KVK, Namakkal
10		2020	Sathya.S. and N.Akila	Composting technology (4'X3' size)	KVK, Namakkal
11		2020	Sathya.S. and N.Akila	Composting of residues (8X6'size)	KVK, Namakkal

Newsletter/Magazine

Name of Newsletter/Magazine	**Frequency**	**No. of Copies printed for distribution**
ICAR-KVK,Namakkal Newsletter for the period from January 2019 to March 2019	Quarterly	100
ICAR-KVK,Namakkal Newsletter for the period from April 2019 to June 2019	Quarterly	100
ICAR-KVK,Namakkal Newsletter for the period from July 2019 to September 2019	Quarterly	100
ICAR-KVK,Namakkal Newsletter for the period from October 2019 to December 2019	Quarterly	100

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

Name of the staff	Title	Dates	Duration	Organized by
Dr.N.Akila Senior Scientist and Head	Attended final action plan meeting for the year 2019-20	22.4.19 & 23.4.19	2 days	TNAU,Coimbatore& ATARI,Hyderabad
	Attended VC review meeting and presented NICRA activities	03.05.19	1 day	VC&RI,Namakkal
	Attended a committee meeting for fixing of wages for contractual staffs of KVK	07.05.19	1 day	TANUVAS,Chennai
	Attended ICAR annual review workshop for the year 2019-20	24.5.19 - 26.5.19	3 days	NAARM,Hyderabad
Dr.N.Akila Senior Scientist and Head Dr.P.Murugan Assistant Professor (Agronomy) Dr.S.Sathya Assistant Professor (Soil Science) and Dr.S.Paulpandi Assistant Professor (Fisheries)	Brain storming session on south west monsoon expectations	28.5.19	1 day	AFAQAL, VC&RI,Namakkal
Dr.N.Akila Senior Scientist and Head	Attended NICRA Annual review meeting	04.06.19-06.06.19	3 days	CRIDA, Hyderabad
	Attended piggery seminar- acted as coordinator for exhibition committee	22.06.19 – 23.06.19	2 days	VC& RI,Namakkal
	Attended Research council and extension education committee meeting	26.06.19	1 day	MVC,Chennai
	International seminar on Innovative Extension Management for uplifting livelihood of farmers status,initiatives and way forward 2019	27.6.19 & 28.6.19	2 days	MVC,Chennai
	ICAR - 91st Foundation Foundation day programme	16.07.19 – 17.07.19	2 days	ICAR,New Delhi

Dr.N.Akila Senior Scientist and Head Dr.C.Sharmila Bharathi Assistant Professor (Horticulture) Dr.P.Murugan Assistant Professor (Agronomy) and Dr.S.Sathya Assistant Professor (Soil Science)	Attended press meeting on SWM and NEM Status	15.10.19	1 day	AFAQAL,VC&RI, Namakkal
Dr.N.Akila Senior Scientist and Head	Capacity building programme for Azolla,Vermicompost and hydrophonic fodder production	08.01.20	1 day	TANUVAS,Chennai
Dr.C.Sharmila Bharathi Assistant Professor (Horticulture)	Attended action plan meeting pertaining to Establishment of Nutri Garden at KGBV & ACCESS residential school	25.06.19	1 day	TNAU,Coimbatore
	Orientation training programme on PKVY	21.08.19	1 day	Conference hall, ATARI Zone X, Hyderabad
Dr.C.Sharmila Bharathi Assistant Professor (Horticulture) and Dr.P.Murugan Assistant Professor (Agronomy)	Attended crop forecast and press meeting on SWM and NEM Status	17.10.19	1 day	AFAQAL,VC&RI, Namakkal
Dr.C.Sharmila Bharathi Assistant Professor (Horticulture)	International conference on Extension for strength ening Agricultural Research and Development	14.12.19 to 16.12.19	3 days	KVK, Mysuru, Karnataka
	Farmer Science Congress	06.01.2020	1 day	University of Agricultural Sciences, Bengaluru
	Training programme on Production Protocol for Entomopathogenic Nematode	24.02.2020 to 28.02.2020	5 days	National Institute of Plant Health Management, Hyderabad
Dr.P.Murugan Assistant Professor (Agronomy)	Fall Army Worm work shop	15.05.2019	1 day	ADAC & RI,Trichy
	ICAR – Short Course training on "Recent advances in Organic Production Systems involving oilseeds for soil health and Export"	16.09.2019 to 25.09.2019	10 days	ICAR – Indian Institute of Oilseeds Research, Rajendranagar, Hyderabad
	ASCI Training of Trainer for Organic Grower	27.11.19 to 29.11.19	3 days	ICAR – ATARI, Hyderabad

	Attended and Presented KVK Namakkal - NICRA Work done activities during NICRA Review meeting	02.12.2019	1 days	ICAR – ATARI, Hyderabad
	State level ATMA Action plan workshop 2020-21	27.01.2020 & 28.01.2020	2 days	Hotel Cliff Resort, Yercaud, Salem Dt
Dr.K.R.Pushpanathan Assistant Professor (Agronomy)	Maize fall army worm Management technology Capsule	22.07.2019	1 day	Department of Entomology, Coimbatore
	Field Diagnosis and management of plant parasitic nematodes in horticultural crops	23.07.2019	1 day	Department of Nematology, Coimbatore
	Entrepreneurship development through agro/ food processing centre	12.12.19 to 21.12.2019	10 days	Central Institute Of Agricultural Engineering, Coimbatore
	Machinery Demonstration Mela 2020	14.02.2020	1 day	Department of Agricultural Engineering, TNAU, Coimbatore
Dr. C. Kathirvelan Assistant Professor (Animal Science)	International Seminar on "Innovative Extension Management for uplifting Livelihood of Farmers – status, Initiatives and Way Forward	27.06.2019 to 28.06.2019	2 days	Madras Veterinary college, Chennai
	Workshop on low cost Hydroponic device for green fodder production	05.07.2019	1 day	Livestock farm complex, TANUVAS, Chennai
Dr. T. Hariharan Assistant Professor (Animal Science)	International conference on "Current Scenario and Future Strategies of disease control for augmenting livestock and poultry productivity under Changing Climatic Conditions"	20.11.2019 to 22.112019	3 days	Veterinary College and Research Institute, Namakkal -2
	XXXV Annual Convention of The Indian Society for Study of Animal Reproduction (ISSAR) & International Symposium on 'Global perspectives to enhance livestock fertility through Modern reproductive techniques for doubling farmer's income"	18.12.2019 to 20.12.2019	3 days	Veterinary College and Research Institute, Namakkal -2
Dr.S.Paulpandi Assistant Professor (Fisheries)	Fish seed production technology and Quality Assurances	05.02.19 to 14.02.19	10 days	College of Fisheries, Brahmapur, Odisha
	Mariculture Technology: Principle and Practices to augment the seafood production in India"	06.11.2019 to 26.11.2019	21 days	Mandapam Regional Centre of ICAR-Central Marine Fisheries Research Institute, Ramanathpuram
Dr.S.Sathya Assistant Professor	Brain storming session on South west monsoon expectations	28.05.2019	1 day	AFAQAL, VC&RI, Namakkal

(Soil Science)	CAFT training on "Current challenges and strategies for management of soil health and sustainable productivity"	11.09.2019 to 01.10.2019	21 days	Jawaharlal Nehru Krishi VishwaVidhyalaya, Jabalpur
	Training of trainers (TOT) programme for ASCI Job role on Soil & Water Testing Lab Assistant	27.11.2019 to 29.11.2019	3 days	ATARI,CRIDA campus Hyderabad
	International Seminar on Innovative Extension Management for uplifting livelihood of farmers-Status, Initiatives and way forward 2019	27.06.2010 & 28.06.2019	2 days	MVC, Chennai

13. DETAILS ON RAIN WATER HARVESTING STRUCTURE AND MICRO-IRRIGATION SYSTEM

Activities conducted				
No. of Training programmes	**No. of Demonstration s**	**No. of plant materials produced**	**Visit by farmers (No.)**	**Visit by officials (No.)**
27 Programmes	12 (Laser drip micro irrigation for water saving)	-	2538	8
6 (as exposure visit)	water conservation technologies through Rain water harvesting structure	-	300	12

14. 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**
Hybrid Maize Grain production with IPM on Fall Armyworm management	8550	5215 ha	Maize production in an area of 8550 ha in every year in Namakkal district. Fall Armyworm incidence was severe (61.3%) in Namakkal district in the last year and yield was drastically reduced by 4637 kg/ha instead of 7445 kg/ha in normal year. No farmers were interest to cultivate maize production and maize grain prize was gone upto Rs.29/kg. In this condition, KVK Namakkal conducted workshop on fall armyworm management, frequent diagnostic field visit, farm school, off campus training, farmers – scientist interaction meet in block level and field demonstration against fall armyworm pest. Due to contionous efforts, Farmers cultivating 3872 ha area under irrigated condition during 2019-20 and adopted integrated fall armyworm management practices & incidence was reduced by 8.5% and recorded average yield of 7125 kg/ha and obtained good net income of Rs.96400/ha.
Castor	345	61.3 %	Due to Fall armyworm incidence, farmers were advised to grow castor hybrids in both rainfed and irrigated condition.

Basal rot incidence in Small onion	620	40%	Integrated Disease management practices against basal rot in small onion was demonstrated and frequent farm advisory given and field visits were made along with Department of Horticulture, Namakkal District to solve the problem.

Major area coverage under alternate crops/varieties

Crops	**Area (ha)**	**Number of beneficiaries**
Oilseeds		
Grounndut – Var. Dharani	27.6	69
Grounndut – Var. CO-7	10.0	25
Castor – Hy.YRCH-1	28.0	70
Vegetable crops(Annual vegetables)	44.8	132
Pulses		
Green gram – Var. CO-8	30.0	75
Black gram – Var. VBN-6/8	30.0	75
Flower crops (Jasmine)	52	167

Farmers-scientists interaction on livestock management

Livestock components	**Number of interactions**	**No.of participants**
Nil		
Total		

Animal health camps organised

Number of camps	**No.of animals**	**No.of farmers**
Vaccination programmes- 3	452	245
Total	**452**	**247**

Seed distribution in drought hit states

Crops	**Quantity (qtl)**	**Coverage of area (ha)**	**Number of farmers**
Groundnut – Var. CO-7	9.50	8.8	22
Grounndut – Var.Dharani	12.2	11.2	28
Green gram – Var. CO-8	4.00	10.0	25
Black gram – Var. VBN-8	4.00	10.0	25
Hybrid Castor – YRCH-1	0.35	5.0	15
Small onion var.Co (On)5	0.01	4.0	10
Annual Moringa var.PKM1	0.03	7.5	32
Total	**30.09**	**56.5**	**157**

Large scale adoption of resource conservation technologies

Crops/cultivars and gist of resource conservation technologies introduced	**Area (ha)**	**Number of farmers**
SRI Method of paddy cultivation in water scarcity areas	60.5	152
Banana-cowpea intercropping with ICM practice	25	18
Laser spray irrigation for small onion	4	8
Total	**89.5**	**178**

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**

	6	**186**	**1**	**46**	**2**	**48**	**0**	**0**	**1**	**350**	**0**	**0**
Total	**6**	**186**	**1**	**46**	**2**	**48**	**0**	**0**	**1**	**350**	**0**	**0**

15. Awards/rewards received 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
KVK, Namakkal received Best NICRA KVK Award 2019 of the ATARI zone X	2019	ICAR – KVK Annual review workshop at CRIDA campus, Hyderabad from 04.06.2019 to 06.6.2019	KVK, Namakkal
KVK, Namakkal received Best KVK of Zone X Award "Pandit Deendayal Upadhyay Rashtriya Krishi Vigyan Protshahan Puraskar – 2018"	2019	ICAR - 91st Foundation Day programme of ICAR at NASC, New Delhi on 16.07.2019.	KVK, Namakkal
KVK, Namakkal received Best Government Organization 2020	2020	News 18 Channel, Coimbatore on 17.01.2020	KVK, Namakkal
Best poster presentation award	2019	ATARI, Zone X, Hyderabad	Dr.N.Akila, Senior Scientist and Head,KVK, Namakkal-Received best poster award during the ICAR Annual Review Workshop for the year 2018-19 on 24.05.19-26.05.2019
Best oral presentation award	2019	ATARI, Zone X, Hyderabad	Dr.N.Akila, Senior Scientist and Head, KVK, Namakkal-Received oral presentation award during the ICAR Annual Review Workshop for the year 2018- 19 on 24.05.19-26.05.2019
Best oral presentation award	2019	TANUVAS,Chennai	Dr.N.Akila, Senior Scientist and Head,KVK, Namakkal-Received oral presentation award during International Seminar on Innovative Extensions Management for uplifting livelihood of farmers-Status, Initiatives and way forward at MVC, Chennai on 26.06.2019-28.06.2019
KUMARAN SIVARAMAN AWARD for Innovative Young Scientist of TANUVAS -	2019	XXI Convocation of the TANUVAS held at MVC, Chennai on 10.12.2019.	Dr.P.Murugan, Assistant Professor (Agronomy), KVK, Namakkal received

Fodder Production, 2018			award from Honble Governor of Tamil Nadu
First prize in CAFT training programme	2019	Professional – 21 days CAFT training programme on current challenges and strategies to improve the soil health and sustainable productivity held during 11.09.2019 to 01.10.2019 at JNKVV, Jabalpur, Madhya Pradesh	Dr.S.Sathya, Assistant Professor (Soil Science), KVK, Namakkal recived first prize from the Programme Organizer, CAFT training, JNKVV, Madhya Pradesh
Haldhar organic farmer award 2019 received from Honorable DG during ICAR Foundation day on 15.6.2019 for Organic Cucurbitaceous vegetable cultivation	2019	ICAR ,New Delhi	KVK beneficiary farmer Individual -Th.P.Saravanan Ariyagoundampatti, Naagiripettai block Namakkal District
Certificate of appreciation for farm innovation – Turmeric Rhizome sowing machine – received from Honorable VC,UAS,Bengaluru during Farmer science congress on 6.1.2020	2020	ICAR – ATARI and UAS,Bengaluru	KVK beneficiary farmer Individual Th.K.Ashok Kumar Karkoodalpatti Namagiripettai Block Namakkal Disrict
Certificate of appreciation for farm innovation – Value addition in Tapioca – received from Honorable VC, UAS, Bengaluru during Farmer science congress on 6.1.2020	2020	ICAR – ATARI and UAS,Bengaluru	KVK beneficiary farmer Individual Th.J.R.Dhanaraj Kalkuruchi Vellalapatti Sendamangalam Block Namakkal Disrict

16. Details of sponsored projects/programmes implemented by KVK

S.No	Title of the programme / project	Sponsoring agency	Objectives	Duration	Amount (Rs)
1	Jal Sakthi Abhiyan Kisan (JSA) Mela I,II & III	ICAR- New Delhi	Water conservation and management	1 day (17.8.2019)	150000.00
2				1 day (3.9.19)	150000.00
3				1 day (30.10.19)	150000.00
4	Workshop on Fall Armyworm Management practices in Maize	ATMA	To create awareness on management strategies for Maize fall armyworm pest	1 day (06.08.2019)	1,00,000.00
5	Importance of water testing and its analysis	Muthayammal College of Arts and Science, Rasipuram,	To create awareness about water health	2 days (04.09.2019 & 06.09.2019)	9,600.00

		Namakk			
6	Awareness programme on right application of fertilizers	PKVY, ICAR, New Delhi,	To create awareness about balanced fertilization based on soil health cards	1 day (22.10.2019)	50,000.00
7	One day workshop on Application and maintenance of agricultural machineries	ICAR-Central Institute for Agriculture Engineering, Regional Centre, Coimbatore	To bring knowledge on uses and application of agrl. machineries	1day (19.11.2019)	12,000.00
8	World soil health day	Reliance foundation, Namakkal	To create awarenss about balanced fertilization based on soil health cards	1 day (05.12.2019)	4,700.00
9	Krishi Mela 2020	ATMA	To create awareness on good agricultural practices for sustainable agriculture.	2 days (23.02.2020 to 24.02.2020)	1,00,000.00
10	Organic Grower	ASCI- ATARI	To impart knowledge and skill on scientific organic farming practices and production and marketing	25 days (29.01.2020 to 17.03.2020)	1,80,000.00
11	Soil and water testing lab assistant	ASCI, GOI, New Delhi	To make employment among unemployed rural youth	25 days (20.02.2020 to 23.03.2020)	2,10,800.00
12	Training on Recent production techniques in Horticulture and Agricultural crops	Department of Horticulture and HEALDS NGO	Productivity enhancement techniques	1 day (7.4.2020)	12700.00
13	Vermicompost production	ATMA, Namakkal	Recycling of farm waste	1 day (27.5.2019)	1700.00
14	Mushroom cultivation	Kandasamy Kandar College, P.Vellore	Entrepreneurship developent	1 day (2.11.19)	7400.00
15	Green fodder production technology	ATMA, Kaancheepuram	Fodder production	1 day (11.11.19)	4300.00
16	Skill Training of Rural Youth	ATMA	Scientific poultry rearing	3 days (18.8.19 -	42000.00

	(STRY) on Poultry Rearing Management		technologies	20.8.19)	
17	Nutritious fodder production	ATMA, Villupuram	Nutritious fodder for feed management	1 day (5.12.19)	6800.00

17. SUCCESS STORIES

Success Story: 1 (Agronomy)

Title : Seed production of Paddy varieties under SRI Method for doubling farmers income.

Background

Th.N.Govindasamy, a Progressive innovative farmer from Perappanchaolai village of Namagiripettai block of Namakkal district has about 9.6 acres of both wet and garden land. Cultivation of Paddy, Groundnut, Banana and Tapioca was his normal practice. He was struggling to cultivate BPT 5204 paddy variety due to heavy incidence of pest and diseases, water shortage and less paddy grain yield. He wants to introduce new paddy variety in his village for higher yield with minimum usage of water through KVK Namakkal to get maximum profit with minimal cost of production.

Intervention technology

- Imparted training on System of Rice Intensification (SRI) and other crop management in paddy.
- Conducted front line demonstration on new paddy variety (CO-52) and ICM practices.
- Conducted demonstration on paddy seed production under SRI Method of paddy cultivation.
- Trained as Farmer Teacher for SRI technology in ATMA training programmes.
- Trained for Paddy seed production technology.
- Frequent Farm advisory services offered.

Intervention Process

He attended *Rabi* awareness campaign programme and Off campus training on ICM in Paddy seep production organized by KVK Namakkal during 2017. Later on, Th.N.Govindasamy along with five farmers from Perappancholai village came to KVK, Namakkal and discussed about the problem of pest and diseases and lowered income due to BPT 5204 paddy cultivation with water shortage. KVK Namakkal offered solution on high yielding paddy varieties instead of BPT 5204 variety, system of rice intensification technology, paddy seed production technologies in Perappancholai village people. KVK, Namakkal also conducted on campus and off campus training programme on seed production technology of new paddy variety and distributed CO-52 paddy seeds, *P*seudomonas, *azospirillum*, pheromone trap and literatures through front Line demonstration programme and made frequent field visit during crop growth stages for rouging & pest and diseases diagnostic. KVK also arranged tie up with department of agriculture for seed production and procurement of new variety for seed purpose.

Outcome

After realizing the new paddy variety features and getting critical inputs, he was cultivated CO-52 paddy variety along with five more farmers in his village for seed production mode. He got motivated farmers from Perappancholai village for cultivation of new paddy variety with SRI Method

of paddy cultivation. During field day programme, KVK Namakkal scientist created awareness and special feature on new paddy variety and importance of miminum usage of water through SRI Method. He obtained paddy seed yield of 8437 kgs per hectare under SRI Method. Net Income generated from the paddy seed is Rs.89192 / ha. The farmer sold their produce at the rate of Rs.16/kg. He also explained his cultivation experiences to other farmers who were visited his paddy field through exposure visit programme organized by Department of Agriculture.

Yield attributes and yield parameters recorded in the demo paddy farmer field at Perappancholai village

Parameters	***CO-52 (Demo)under SRI Method***	***BPT 5204 (Check)under conventional method***
No. of productive tillers/plant	36.4	19.6
Blast incidence (%)	1.45	4.90
Stem borer incidence (%)	3.4	7.20
Leaf folder incidence (%)	3.1	7.40
No. of grains per panicle	189	182
1000 grain weight (g)	15.18	15.14
Panicle length (cm)	17.06	16.40
Grain yield (kg/ha)	8437.0	5865.0
Straw yield (kg/ha)	7450.0	6310.0
Gross cost (Rs./ha)	45800	47250
Net return (Rs./ha)	89192	46590
BCR	2.94	1.98

Impact

He supplied 3100 kg of CO-52 paddy seeds to agricultural department and also supplied 3550 kg of paddy seedss to nearby needy farmers in and around Mullukuruchi areas. The cost of cultivation was reduced by Rs.7600/ha due to lesser number of pesticide spray under SRI with CO-52 paddy variety. Drastically 3.4 percent reduced paddy stem borer and leaf folder incidence in demonstration plot. He also acts as “Farmer Teacher” for SRI Paddy production technology in ATMA programmes. Currently 65 farmers cultivating CO-52 paddy and 124 ha areas covered by SRI method widely practiced in Perappancholai village.

Success Story: 2 (Agronomy)

Title : Seed production of high yielding Green gram variety (CO-8) for tripling farmers income.

Background

Th. P. Stalin, innovative progressive farmer from Kalyani village in Puduchattram block of Namakkal district. He owns about 12.5 acres of both dry and garden land with minimum water facility and choosen low water required crops in every year. Cultivation of Black gram, green gram,

groundnut, sorghum, maize and tapioca was his normal practice and was finding very difficult to manage yellow mosaic virus disease and getting resistant variety in green gram crop. He was achieved only average yield of green gram i.e.610 kg /ha and fetched low market price and finally received less farm income (Rs.22550/ha).

Intervention technology:

- Imparted training on high yielding green gram varieities and integrated crop management in green gram
- Conducted cluster front line demonstration on green gram for introduction high yielding (CO-8) and ICM practices
- Trained for pulses seed production technology and enrolled in PPP mode
- Frequent Farm advisory services offered
- Trained for integrated pest and diseases management in pulses.
- Opportunity given for television talk on success of green gram cultivation.

Intervention Process :

KVK Namakkal recommended new green gram CO-8 variety under both rainfed and irrigated condition is the best option to manage yellow mosaic virus disease, short duration, improve farm income and synchronized maturity. KVK distributed critical inputs like green gram CO-8 variety seeds, pseudomonas, trichoderma viride, biofertilizers and pheromone traps, pulse wonder, yellow sticky trap and neem oil cluster through front line demonstration programme and made frequent field visit during growth stages. After getting the critical inputs, he was grown green gram in 3.6 acre as alternate variety in that village. KVK Namakkal also developed marketing network with seed hub project implemented by KVK Salem and department of agriculture, Namakkal.

Outcome

At the end of season, he recorded a yield of demo plot 1455 kgs / ha compared to already existing variety (VBN-3) recorded 615 kgs / ha. He has earned net profit of Rs.102015/- through certified seed production of high yielding green gram (CO-8) variety with ICM practices compared to traditional variety with local market earned Rs.27550/-. The entire quantity of green gram seeds sold to KVK Salem seed hub project and department of Agriculture at the rate of Rs.103/kg. According to farmer feedback, CO-8 Green gram variety is short duration, produced more number of pods (76 pods/plant), synchronized maturity, suitable for machine harvest and there was no incidence of yellow mosaic virus disease during crop growth period. It was performed well under both rainfed and irrigated condition.

Yield attributes and yield parameters recorded in the demo green gram farmer field at Kalyani village

Parameters	***Green gram CO-8 with ICM practices (Demo)***	***Green gram VBN-3 With conventional method (check)***

Germination percentage (%)	95.4	92.1
Number of pods per plant	76.2	48.4
Yellow mosaic virus incidence (%)	1.1	5.4
Seed yield (kg/ha)	1455	615
Percentage of yield increase	136	-
Price of selling rate (Rs./ka)	103	75
Gross cost (Rs./ha)	47850	18575
Gross return (Rs./ha)	149865	46125
Net return (Rs./ha)	102015	27550
BCR	3.13	2.48

Impact

He also motivated his village farmers for adoption of green gram (CO-8) variety and ICM practices for seed production in the same season. After seeing this crop nearby farmers, 25 farmers from that village was grown green gram (CO-8) variety for seed production purose. Now a days 45.6 ha area of green gram growing farmers (74 farmers) from Kalyani village adopting green gram CO-8 variety with ICM practices for seed production only. They have recorded avareage yield of 1125kgs/ha with net income of Rs.81550/ha from seed production field. And also provided more number of employment mandays for their village people through seed production.

Success Story: 3 (Horticulture)

Title: Role of KVK,Namakkal in Popularization of IIHR crop boosters - A real income booster for vegetables and banana growers in Namakkal District

Introduction

Vegetable and fruits cultivation is a profitable business. Vegetable production is very important in human nutrition and it is an important source of farm income The farmers market the vegetables and fruits locally in farmers markets, traditional markets or farmers can contract their whole crops to wholesalers or retailers. The area under vegetable crops in Namakkal District is ha with a production of MT/Year. The major vegetable crops being cultivated in this District are Aggregatum onion, Tomato, Brinjal, Bhendi, Chillies, Cucurbits, lab lab, beans and cabbage. Among the 15 blocks in Namakkal District Namagiripettai, Erumapatti, Sendamangalam, Rasipuram, Pudhuchathiram and Vennandhur are the major vegetable producing blocks whereas in banana Mohanur, Paramathi, Kabilarmalai and Namagiripettai are the prominent blocks.

Problem

In Namakkal District, adoption of high yielding cultivars and FI hybrids and suitable production technologies has largely contributed to the production and productivity. With changes in incomes and consumption patterns, demand for vegetables has been increasing every year. Micronutrient deficiency is major problem in vegetables and banana almost all the districts of Tamil Nadu especially in Namakkal District. The micronutrient delineation studies revealed that Zinc, Iron, Boron, Copper and Manganese in these soils are deficient more than 20%. In addition to that the

availability of micronutrients is low in several blocks of Namakkal District due to low organic matter and high pH of soil. This leads to flower / fruit drop, deficiency symptoms exhibited in leaves, various growth stage of vegetables/ Banana and finally reduced yield potential of the crop (12-15%)

Plan, implementation of activities and support by KVK

KVK, Namakkal has popularizes the IIHR vegetable and banana booster formulation which can boost the yield in vegetable and banana by 15-20% and also improve the quality of the produce. In order to make available the product in the locality for the easy adoption by farmers, the KVK has sold the IIHR vegetable and banana special to farmers since 2011.

The KVK has included IIHR vegetable and banana special as one of the important critical inputs in its activities related to vegetable crops / Banana under OFT/FLD, trainings and other extension activities since 2011.

Table.1.Popularization of IIHR crop boosters through various activities

Sl. No	Name of the activity	No.of programmes	No.of farmers benefitted
1.	OFTs	13	118
2.	FLDs	20	540
3.	Training (both on + off campus)	82	2214
4.	Extension activities (Advisory services, field visit, Diagnostic visit and Exhibitions etc.,)	147	3812

In addition to that, so far 1422 kg of IIHR banana booster and 1110 kg of IIHR vegetable boosters were sold by KVK, Namakkal to 2132 farmers since 2011. After seeing the success of the technology, it is spreading to other vegetable/ banana growers existing in the district.

Output

The productivity of vegetables and banana has increased and overall 10 – 15 % of yield enhancement was observed in the following vegetables and Banana.

Table 2. Performance of IIHR crop boosters on Vegetables and fruits in Namakkal District

S.No	Crops	Demo	Check	% increase
1.	Small onion	6.8	6.1	11.5
2.	Tomato	24.7	22.3	10.8
3.	Bhendi	3.2	2.8	14.2
4.	Brinjal	17.6	15.9	10.7
5.	Chilli	2.82	2.56	10.2
6.	Cucurbits (Bitter gourd/ Ribbed gourd / Snake gourd/ Bottle gourd)	5.4	4.7	14.9
7	Annual moringa	14.6	13.2	10.6
8	Lab lab	2.16	1.9	13.7
9	Beans	2.3	2.0	15.0
10	Banana	14.5	12.7	14.2

Outcome

- The usage of IIHR Vegetable special and Banana special technology has spread over an area of 380 hectares in Namakkal district due to the effort taken by KVK in collaboration with State Department of horticulture.
- Farmers also got an additional income of Rs.5000-10000/0.4 ha by the yield enhancement of fruits and vegetables through foliar application of IIHR crop boosters at critical crop growth period.

Impact

There has been a constant increase in the area and productivity of vegetables in Namakkal District. Use of IIHR vegetable and banana special is directly contributing an average yield increase by 10 -15 % in vegetable crops and banana. As the technologies have been used by more than 2132 farmers in Namakkal District, demand for IIHR crop boosters is increasing not only from Namakkal district, but also from neighboring districts.

Success story - 4 (Soil Science)

Title: DEMONSTRATION ON BANANA-COWPEA INTERCROPPING WITH ICM PRACTICE ON SOIL FERTILITY CHANGES AND CROP PRODUCTIVITY OF BANANA

Introduction

Banana is one the important fruit crop and which is cultivated to an extent of 1374 ha in Namakkal district. Mohanur, Namagiripettai, Sendamangalam, Tiruchengode, Paramathi blocks are the major belt for banana. Cowpea is leguminous crop, producing branches and lengthy vines to cover the entire surface of the soil. Leguminous crop fixes the atmospheric nitrogen & improves the soil fertility also. With this preview banana-cowpea intercropping was introduced through KVK front line demonstration with ICM practice to farmers at DFI village.

Problems

Mono cropping of banana is the normal practice adopted by farmers and meager population is cultivating pulses (green gram & black gram) and small onion as intercrop in banana for their family consumption. At the same time growing of weeds, water scarcity, shortage of agricultural labours during monsoon, deficiency in available nutrients (OC-71%, N -78%, Zn-86%, B-29.5% & S-18.6%) addressed as common problem in all areas. In addition, continuous cropping without soil test based fertilizer recommendation leads to the widespread nutrient deficiency in the soil and reduction in yield of crops. Fruit cracking, pest & disease incdidence and poor withstanding capacity of crops under drought condition might be associated with nutrient deficiency and thus leads to 18-25 % reduction in yield of crops.

Intervention

To address the above problems, KVK, Namakkal has conducted Front Line Demonstration (FLD) in 15 farmer's field in an area of 6 ha at Ganganaickenpatti villages of Mohanur block with Poovan banana variety. The following interventions were included with ICM practice

- Intercropping with cowpea - Cowpea @ 15 kg ha^{-1} was sown in between banana plants and then Insitu incorporation of cowpea was done around the banana within 45 days after sowing of cowpea. Then 15 days later, again cowpea was sown in the same field, incorporated the residues after collecting grains.
- Soil application of biofertilizers & biocontrol agents.
- Soil test based macro nutrient application
- Foliar spraying of IIHR banana booster from 3 month after planting upto fruit stage with 1 month intervals
- Need based plant protection measures

Result

With regard to nutrient status after cowpea incorporation, the organic carbon content and available nitrogen was increased noticeably from 0.41 to 0.68 % and 201 to 248 kg ha^{-1} respectively, than other soil parameters and decreased to 0.49% and 224 kg ha^{-1} at harvesting phase (Table 1). The increase was 38 kg in available nitrogen and 0.27% in organic carbon observed in soil after incorporation and content was reduced at harvesting whereas when compared to initial value, there was built up observed.

Table 1. Effect of intercropping on nutrient status of soil

Parameters	Initial soil test value	KVK intervention (Demo)	Post harvest soil test values	
			KVK intervention (Demo)	Farmers practice (Check)
Soil reaction	7.18	7.54	7.41	7.59
Electrical Conductivity (dS m^{-1})	0.044	0.066	0.047	0.057
Organic carbon (%)	0.41	0.68	0.49	0.46
Available nitrogen (kg ha^{-1})	210	248	224	218
Available phosphorus (kg ha^{-1})	17.65	18.09	18.01	17.98
Available potassium (kg kg^{-1})	157	166	164	159
Available sulphur (mg kg^{-1})	12.02	12.43	12.18	12.04
Available zinc (mg kg^{-1})	0.99	1.01	1.01	0.98
Available boron (mg kg^{-1})	0.34	0.39	0.34	0.31

Highest banana yield of 35.08 t ha^{-1} was recorded in the demo plot (KVK intervention from sowing to harvest) whereas farmers practice (check) recorded 29.86 t ha^{-1} (Tale 2). The demo yield found its superiority by recording 17.48 % yield increase over check and having higher net return of

Rs.2,61,614 with BC ratio 2.68 than check. Also recorded highest bunch weight 25.60 kg and no. of hands/bunch 10.47 in demonstration plot.

Table 2. Yield and economics of banana

Treatments	Bunch weight (kg)	No. of hands/bunch	Yield (t ha^{-1})	Cost of cultivation (Rs./ha)	Gross income (Rs./ha)	Net income (Rs./ha)	B:C ratio
KVK intervention (Demo)	25.60	10.47	35.08	156219	417833	261614	2.68
Farmers practice (Check)	22.13	9.20	29.86	145672	287600	141928	1.97

Output

- Farmers opined that intercropping with ICM practice improved the size of single fruit in the bunch, number of hands per bunch and over all bunch weight. Hence farmers fetched more price on an average of Rs. 75 /- to Rs.100/- per bunch.
- The technology more viable in increasing the yield of banana and hence farmers are being continuously adopted this technology Since 2018**.** The success of this technology being popularized in KVK routine training, regular advisories, farmers group meetings and extension functionaries programme.

Out come

- After seeing the results, nearby farmers started to grow cowpea as intercrop in banana to an extent of 18 ha. It arrests the weed growth and conserves the moisture from losses. Hence farmer could save Rs. 5,000/ha per year per crop by skipping one weeding with agriculture labours. The expenditure incurred for purchase of seed material of cowpea used for intercropping could be met from amount of N added to the soil by cowpea insitu incorporation. With this, it can be concluded that growing of cowpea in banana resulted in improvement in soil fertility as well as yield of banana.

- Th.M.Sellappan, Ganapathipalayam honorurd during 13th SAC meeting for his effect to populairize and adopt the technology and association with KVK. Success story was documented by Doordarshan, Chennai and braoadcated on 05.03.2020.

Success story - 5 (Soil Science)

Title: DEMONSTRATION ON MULTIGRAIN GREEN MANURING ON SOIL FERTILITY CHANGES AND CROP PRODUCTIVITY OF SMALL ONION

Introduction

Small onion is one of the most important commercial vegetable in India which is cultivated to an extent of 1374 ha in Namakkal district. Erumaipatti, Puduchathiran, Vennadur, Namagiripettai and

Sendamangalam are the major growing area of small onion. Most of the areas recorded deficient in organic and could be increased by the addition of organic manures expecially farm yeard manure. Due to shrinkage in organic manure availability, promotion of green manuring with sunhemp or daincha or multigrain green manuring is recommended.

Problems

Integrated nutrient management practice is the way to apply nutrient source to the soil. Now a days application of inorganic fertilizers alone is the common practice seen everywhere instead of INM. This leads to deterioration in soil perperties and soil health too. The Deficiency recorded in most of the areas was (OC-71%, N -78%, Zn-86%, B-29.5% & S-18.6%).

Intervention

To address the above problems, KVK, Namakkal has conducted Front Line Demonstration (FLD) in 100 farmer's field in an area of 40 ha at NICRA villages Vadavathur and Jambumadai during 2017 and 50 farmer's field in an area of 20 ha during 2020. The following interventions were included with ICM practice

- Mulgrain green manuring - Sowing of multigrains @ 20 kg ha^{-1} was sown and incorporation in the same field was done within 45 days after sowing. Then 15 days later, sowing of small onion was done.
- Soil application of biofertilizers & biocontrol agents.
- Soil test based macro nutrient application
- Foliar spraying of vegetable booster @5/litre
- Need based plant protection measures

Result

Available nutrient status was increased from initial value to 45 days after incorporation of green manures. The organic carbon was increased from 0.49 to 0.65 % and available nitrogen from 189 to 218 kg ha^{-1}, potassium from 219 to 263 kg ha^{-1}. Even though there was recorded reduction in available nutrients, when compared to initial value there was observed buildup in soil fertility. Soil samples collected initial, after and post harvest stages and results are presented here under

Table 1. Effect of multigrain green manuring on nutrient status of post harvest soil

Parameters	Initial soil test value	KVK intervention (Demo)	Post harvest soil test values	
			KVK intervention (Demo)	Farmers practice (Check)
Soil reaction	7.52	7.45	7.56	7.59
Electrical Conductivity (dS m^{-1})	0.078	0.08	0.11	0.057
Organic carbon (%)	0.49	0.65	0.52	0.46

Available nitrogen (kg ha^{-1})	189	218	201	197
Available phosphorus (kg ha^{-1})	15.9	16.5	14.5	14.98
Available potassium (kg kg^{-1})	219	263	224	159
Available sulphur (mg kg^{-1})	17.4	17.5	17.2	12.04
Available zinc (mg kg^{-1})	0.98	1.02	0.85	0.81
Available boron (mg kg^{-1})	0.38	0.42	0.39	0.31

Table 2. Yield and economics of small onion

Treatments	Bulb yield (kg/ha)	Cost of cultivation (Rs./ha)	Gross income (Rs./ha)	Net income (Rs./ha)	B:C ratio
KVK intervention (Demo)	12402	78989	186030	107041	2.36
Farmers practice (Check)	10567	74562	158505	83943	2.13

Output

- Farmers opined that multigrain green manuring with ICM practice improved the yield of small onion and having yield difference 17.36% over check.
- The availability of daincha or sunnhemp during mon soon become scarce and rate also Rs.100-150 kg whereas sowing with multigrains not an problem and farmers can mix whatever seeds available with them and market at low cost.
- Farmers are being continuously adopted this technology Since 2017 and observed improvement in soil nutrients**.** The success of this technology being popularized in regular training programmes, advisory services, group meetings and extension functionaries programme.

Out come

- After seeing the results, multigrain green manuring popularized to an extent of 38 ha in various places of Namakkal district. Hence farmer could save Rs. 13,000/ha per year per crop by including green manuring practice instead of farm year manure and soil fertility too.
- Th.R.Balarselvan, Jambumadai - Success story was documented by Doordarshan, Chennai and braoadcated on 30.03.2020.

18. CASE STUDIES

1.IMPACT ON TECHNOLOGY ADOPTION OF CASTOR HYBRIDS AS PURE CROP IN ELACHIPALAYAM BLOCK OF NAMAKKAL DISTRICT

Introduction

Castor (*Ricinus communis L.*) is the most important non - edible industrial oilseed crop grown across the world in tropical, sub-tropical and warm temperate region. It has great industrial and commercial value. In Tamil Nadu, castor was grown as a low input dry land crop in an area of 15.0 thousands ha. Mostly used as a border or inter crops, where its drought - hardy nature helps to provide

as cash for farming community and castor leaves provided for excellent green fodder for small ruminants. Castor grown in both rainfed and irrigated condition in Namakkal district. The district average yield was 855 kg/ha. With regards to area and production are 1300 ha, 1111.5 tonnes respectively (2018-19). Elachipalayam block is a potential area to cultivate castor crop in 225 ha area during Kharif and Rabi season by small and marginal farmers, who have already exploited 65 per cent of the potential area under rainfed. As farmers were growing different local castor varieties in intercrop, border crop and some parts as pure crop under rainfed condition and obtained very poor yield and less farm income.

In this regards, KVK Namakkal conducted On farm trial, FLD and Cluster Front line demonstration since 2018 at farmers field of Kokkalai village of Elachipalayam block of Namakkal district to select suitable casto hybrids for higher yield and more farm income. This village is situated at 11.37^0 N latitude and 78.05^0 E longitude. The soil type is sandy clay loam with a pH of 7.8 and EC of 0.6 dSm^{-1} with a soil nutrient status of low Nitrogen (210 kg/ ha), medium Phosphorus (10.6 kg / ha) and high Potassium (325 kg /ha). The average rainfall of Kokkalai village is 314 mm during south west monsoon.

Problems

The majority of rainfed farmers cultivating castor as intercrop, border crop and somes places as pure crop in kharif and rabi season of every years.They have recorded very low yield (560-600 kg/ha) due to unknown castor varieties, border crop and inter crop, incidence of semilooper, leaf hoppers and botrytis deiseas, non availability of high yielding hybrids and non adoption of improved crop management practices viz., seed treatment with pseudomonas, recommended fertilizer application, proper weed management, foliar nutrition and integrated pest management. No awareness on pure crop cultivation of castor under both rainfed and irrigated condition.Finally farmers obtained low yield and less farm income under rainfed farming.

Intervention

To introduction of high yielding castor hybrids (YRCH-1 and DCH-519) and integrated crop management practices to increase the castor productivity in Namakkal district through on farm trial (OFT), front line demonstration (FLD) and cluster front line demonstration (CFLD) under National Mission on Oilseeds and Oilpalm (NMOOP) since 2018. KVK Namakkal was conducted Cluster front line demonstrations (CFLD) in area of 18 hectares of 45 selected farmer's fields. The demonstrations aimed to attain the higher castor seed yield, less cost of cultivation and higher net income. KVK Scientist imparted training programme on improved castor production technologies and demonstrated seed treatment with pseudomonas and rhizobium, foliar spray of TNAU Castor Gold and integrated pest and diseases management practices. The critical inputs like hybrid castor seeds (YRCH-1 & DCH-519), Pseudomonas, TNAU Castor Gold and need based pesticides were provided to the farmers. KVK Agronomist facilitated in regular field visits, 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.

Output

The Castor yield data were recorded from Elachipalayam blocks under rainfed condition. One farmer teacher was developed (Th.P.Govindaraj, Kokkalai village) to handle technical guidance on castor production technology and awareness on castor pure crop cultivation and marketing arrangements. The average yield and other parameters in SRI method mentioned below. The average yield and yield parameters recorded in the castor field are mentioned below.

Table 1. Yield parameters recorded in Cator hybrid YRCH -1

Parameters	***Castor hybrid (DCH-177)***	***Castor hybrid YRCH-1(FP)***	***Castor hybrid DCH-519***
Plant height (cm)	173.0	136.0	194.4
Days to 50% flowering	77.0	67.0	72.0
No. of effective spikes/plant	37.40	43.80	38.20
Spike length (cm)	35.80	38.40	44.40
No. of capsules / spike	46.20	53.40	57.40
Leaf hopper incidence (%)	13.60	3.20	2.20
100 seed weight (g)	24.00	24.32	25.02
Seed yield (tons/ha)	1037.0	1297.0	1311.6
Gross cost Rs. /ha	23630	23620	23570
Gross return Rs. /ha	51800	64850	65480
Net return Rs. /ha	28250	41170	41910
BCR	2.19	2.73	2.77

Demonstration results showed that cultivation of castor hybrid (DCH-519) with integrated crop management practices recorded more number of effective spikes per plant (38.20), more number of capsules per spike (57.4), very less incidence of leaf hopper (2.20 %), higher grain yield (1311.6 kg/ha) as compared to other hybrid (DCH-177) and farmer practice (YRCH-1). With regard to farmer practice (YRCH-1), more number of effective spikes per plant (43.80), more number of capsules per spike (53.4), very less incidence of leaf hopper (3.2 %), higher grain yield (1297 kg/ha). It is on par with DCH-519 hybrid. The least grain yield (1037 kg/ha) and higher incidence of leaf hopper (13.6 %) were observed in DCH-177 hybrid. Economics of the study revealed that cultivation of castor hybrid (DCH-519) with integrated crop management practices (DCH-519) registered higher net returns (Rs.41910/ha) and benefit cost ratio (2.77) followed by YRCH-1hybrid. Fetched higher castor market price (Rs.48/kg) for all hybrids compared to groundnut and most of the farmers were accepted preference for DCH-519 and YRCH-1 hybrids. Finally study showed that cultivation of castor hybrids (DCH-519 and YRCH-1) under rainfed condition responded well in terms of yield attributes, seed yield and higher net returns.

Outcome

Cultivation of castor hybrids viz., DCH-519 and YRCH-1 recorded more number of spikes per plant, more number of capsules per spike and higher grain yield compared to DCH-177 under rainfed condition. Very less incidence of pest and diseases was observed in YRCH-1 & DCH-519 hybrids and also fetched good market price for all hybrids. Intstead of inercropping with groundnut, castor cultivation in sole crop yielded more profit. Many farmers were accepted to cultivate castor hybrids as a pure crop under rainfed or irrigated condition due to less cost of cultivation, easy management and less labour required crop during field day.

Impact

- KVK intervention such as OFT trials, CFLD demonstration, awareness programme, field day, training and diagnostic field visit along with improved high yielding hybrids and ICM Practices, Castor crop area was increased to 365 ha and 76.2% of area covered by YRCH-1 and DCH-519 hybrids in Elachipalayam blocks.
- KVK intervention had lead to effective changes in increasing pure crop area of castor cultivation along with improved production technologies.
- Every farmers from that blocks obtained average castor seed yield of 1350 kg/ha under rainfed condition.
- The castor pure crop adopted farmers got 35 percent additional income in existing crop cultivation under rainfed farming.
- The cost of cultivation of Rs.7800/ha saved due to castor pure crop cultivation compared to groundnut crop under rainfed farming.

2.WOMEN EMPOWERMENT THROUGH ADDITIONAL CROP CULTIVATION – A CLIMATE RESILIENT PRACTICE OF NAMAKKAL DISTRICT

Introduction

National Innovation on Climate Resilient Agriculture (NICRA) is being implemented by Krishi Vigyan Kendra, Tamil Nadu Veterinary and Animal Sciences University, Namakkal at Vadavathur and Jambumadai village of Erumapatti block, which has recorded an average rainfall of only 400 mm for the past 20 years. In Vadavathur village, 829 families with a population of 2850 are directly / indirectly involved in agriculture, of which 600 families were benefited under the NICRA scheme. In Vadavathur and Jambumadai village, small onion is the major crop cultivated as an annual crop in more than 300 acres and it is the only source of income in two seasons.

Problem

Practice of sole cropping is predominant in Namakkal District leads to poor market returns due to huge arrival of single crop. After the harvesting of small onion farmers kept the land as barren. In NICRA village, after the cropping season in many fields the excess water of bore wells and open wells during the normal year, which has not been effectively utilized for the cultivation of additional crops which may enhance the farm women income during the summer season.The farm women not cultivating any crop even they got excess rainfall.

Intervention

- To alleviate these problems an additional crop cultivation in small area with other annual vegetables in an area of 50 cent to 1 acre a feasible option to minimize market risk and ensure reasonable returns for small and marginal women farmers.
- To take care of this precarious situation, Krishi Vigyan Kendra took an intervention among the farm women who could exclusively devote their time, energy and land for the cultivation of vegetables.
- KVK, Namakkal took initiative along with Department of Horticulture for getting NADP schemes in turn helped to improve farm facilities like drip irrigation, Pandhal system, Vermicomposting unit for vegetable cultivation and economic up liftment of farm women in NICRA village.
- KVK provided technical backstopping through training and critical inputs such as vegetable seed *viz.*, Tomato, Brinjal, Bhendi, Cluster bean, Annual Moringa, Lab lab and Cucurbits through FLD & OFT programmes for cultivation of annual vegetables as additional crop to the farmers.
- Farmers also learnt new technologies through exposure visits made to Indian Institute of Horticultural Research, Bengaluru. KVK also facilitated to get *Uzhavar santhai* card to vegetable growers of NICRA village in convergence mode with Department of Agriculture Marketing also arranged transport facility with the help of District Administration to reach Uzhavar santhai.

Output

Table 1: Economics of additional crop cultivation during excess rainfall

Farm women category	Crops grown	No. of farm women involved	Total Yield (kg)	Average Sale price (Rs/kg)	Expen diture (Rs)	Gross income (Rs)	Net income (Rs)	C:B ratio
I	**Fruit vegetables 2 crops** 1.Tomato – 25 cent 2.Brinjal – 25 cent	6	 3000 1200	 10 40	27800	78000	50200	2.8
II	**Fruit vegetables 3 crops** Tomato-20cent Brinja l- 20 cent Bhendi- 10 cent	5	 2400 940 410	 10 40 20	22600	69800	47200	3.0
III	**Leguminous vegetable along with Annual moringa** Lab lab – 15 cent + Cowpea / cluster bean – 10 cent Moringa – 25 cent	8	 480 800 3000	 40 20 15	22100	80200	58100	3.6
IV	**Cucurbits** Bitter gourd- 20 + Snake gourd-15 + Ribbed gourd - 15)	6	3050	30	26680	91500	64820	3.4
V	Cucurbits (40 cent) + Tomato (10 cent)	5	2440 1200	30 10	25300	85200	59900	3.4

Depends on the availability of water, the farm women able to cultivates 2- 3 types of vegetables in an area of 50 cent to an acre as additional crop after the harvest of small onion cultivated during Rabi. Based on the types of vegetable growing, the farm women categorized in to five group's *viz.*, 1.Fruit vegetable grower – 2 crops, 2.Fruit vegetable grower – 3 crops 3. Legume type of vegetables grower along with annual moringa 4.Cucurbits grower and 5. Cucurbits along with Tomato.

Most of the vegetables *viz.*, lab lab, beans, bhendi, cluster bean, ribbed gourd the first harvests was made by farm women on 45 -50 days after sowing, whereas snake gourd, bitter gourd, brinjal, tomato were harvested on 50 - 60 days after sowing / planting. The farm women harvest the lab lab, vegetable cowpea in 3 days / week. Other vegetables harvested daily. Moringa leaves also harvested in addition to pod & sold @ Rs 5 / small bundles & Rs.10/ big bundles. The average sale price of vegetables vary depends on the crops. The farm women sold brinjal and lab lab @ Rs.40/ kg, cucurbits @ Rs.30/kg, vegetable cowpea, bhendi and cluster bean @ Rs.20/kg and Tomato & Moringa @ Rs.10/kg at Uzhavar santhai, Namakkal

The economic analysis (Table 1) revealed that the category I farm women spent highest expenditure (Rs.27,800/-) for their additional crop cultivation, which was followed by category IV (Rs.26,680/-). This may be due to high cost involved towards purchase of seed,intercultural operations like staking & training to tomato hybrids & cucurbits. Whereas category III farm women spent minimum expenditure (Rs.22100/-) for leguminous vegetable cultivation along with annual moringa. This could be achieved by means of low cost involved for cultivation. Category IV farm women obtained the maximum net return (Rs. 64820/-) which was followed by category V (Rs.59, 900/-) and category III (Rs.58100/-).

Outcome

The farm women involved for more than 2 crops cultivation in an area of 50 cent got appreciable net income during the Rabi season having surplus rainfall. Therefore, farm women got good amount towards the cultivation of annual vegetables as an additional income during the excess rainfall received in the year 2013 (639 mm), 2014 (823 mm), 2015 (640.5 mm), 2017 (638 mm) and 2018 (549.8 mm) . Hence it is proved that the excess water of bore wells and open wells during the normal year in NICRA villages has been effectively utilized for the cultivation of additional crops which may enhance the farm women income during the summer season.

Impact

The results of the study on additional cropping with seasonal vegetables for the sustainable crop production in NICRA villages were found to be encouraging. The performance of these

crops with different hybrid varieties proved that there is an ample scope to grow these crops due to prevailing suitable agro climatic condition of the village as well as the gaining (Dasgupta and Bhoumik 2014). Because of the efforts made by KVK, now 10 types of vegetables are being cultivated in an area of 44.8 ha during Rabi season by 132 farmers and 11 farmers adopted *Panthal* system of vegetable cultivation under NICRA scheme, on their own cost and contribution of NADP scheme

3. IMPACT ON TECHNOLOGY ADOPTION OF FEEDING OF MULBERRY LEAVES IN DAIRY ANIMALS AND SMALL RUMINANTS IN VENNANDHUR BLOCK OF NAMAKKAL DISTRICT

Introduction:

India's silk industry is the world's second largest after China contributing to about 18 per cent to the world production. While the demand for silk in the State is about 3,000 tones every year, about 1,900 tones are produced every year in the State.

Though all the five kinds of silk is produced across the country, over 70 per cent of the production in the State is mulberry silk. The larva of mulberry silk moth grows for about 25 days feeding mulberry leaves and the fully matured larva spins to protect itself just before the pupa state forming the cocoon.

With cocoon production yielding rich dividends, more farmers are taking up the activities in the district during the current year. A Government Seed Farm is located at a sprawling 13.10 acre at Semmedu in Kolli Hills of this district where seed cocoons are produced and sold to farmers. Over 1,179 farmers were involved in mulberry cultivation in 1,811 acre in the district in the past five years. They were given assistance and grants for installing drip irrigation system, constructing rearing sheds and purchase of gadgets and for cultivation. The farmers were encouraged to adopt modern silkworm rearing techniques for improving productivity. About 700 acre of land is currently under mulberry cultivation as farmers have showed interest in the activities.

Problems

In Namakkal district, huge scarcity of green fodders for feeding of livestock throughout the year especially during summer due to lack of water resources for irrigation which leads to high cost of feeding concentrates and forages for animals and high cost production of milk and meat from livestock.

On the other hand, improper utilization and wastage of mulberry leaves to small ruminants and dairy animals by sericulture farmers. Mulberry leaves contain good amount of protein (25-35% protein) and minerals (2.42-4.71% Ca, 0.23-0.97% P) and that can be used as an alternate to green fodder for feeding of livestock throughout the year especially during summer. No awareness among farmers that mulberry leaves could be used as an alternate to green fodder for feeding of livestock

Intervention

To introduce mulberry leaves can be used as an alternate to green fodder for feeding of livestock to increase the productivity of milk and meat in dairy animals and small ruminants, respectively in Namakkal district through on front line demonstration (FLD) on feeding Mulberry leaves @ 1-1.5 kg/animal/day for better weight gain in Small Ruminant production system and Demonstration of feeding Mulberry leaves @ 5kg/day/animal for better milk yield in crossbred dairy animals has been conducted since 2018.

The demonstrations aimed to attain the better weight gain in goat and better milk yield with improved fat and SNF per cent in crossbred dairy animals. KVK Scientist imparted training programme on feeding of Mulberry leaves in small ruminants and cross bred dairy animals and demonstrated the feeding value of Mulberry leaves in small ruminants and cross bred dairy animals for enhancement of growth and milk yield with improved fat and SNF per cent, respectively. KVK Agronomist facilitated in regular field visits, group discussions, farmer-scientist interaction and field days were conducted to enlighten the farmers about the benefits of feeding of mulberry leaves to ruminants to reduce the cost of production of meat and milk by improving the animal productivity in small ruminants and dairy animals, respectively. The yield was recorded and economics were worked out based on the current market price of inputs and produce.

Output

The body weight gain data in small ruminants and milk yield data along with fat and SNF per cent were recorded from the FLDs conducted at Vennanthur block of the district. One farmer teacher was developed (Th. Karupannan, Moolakadu village) to handle technical guidance on feeding value of mulberry leaves and awareness of utilization of mulberry levels along with TANUVAS Mineral mixture for livestock feeding and. The average yield and other parameters in SRI method mentioned below. The average body weight gain parameters in goats and milk yield data along with fat and SNF per cent recorded in the FLDs are mentioned below:

Table 1. Average body weight gain and milk yield data in goat

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)
Body weight at 6months in goat 19 kg	Body weight at 6months in goat 16 kg	3.0 kg/animal in 6 months	-	--	3420	5700	2280	1.66	3300	4800	1500	1.45
Milk yield 6.74 lit/day/dairy animals	Milk yield 6.1 lit/day/ dairy animals	0.64 lit/day/ animal	Fat % 3.82	Fat % 3.50	6143	7886	1743	2.28	6435	7020	585	2.09

Outcome

In small ruminants, the average body weight gain was 3 kg higher in goats at 6 months of age, fed with mulberry level @ 1.5kg/animal. In milking goats higher milk yield also recorded which is good for kids. Non-lactating goats, there is less fat deposition and oestrous problems were noticed.

In cross bred dairy animals, supplemented feeding of five kg of Mulberry leaves per animal per day along with TANUVAS Mineral Mixture @50g/day/animal has promising results and able to produce higher average milk yield of 0.64 lit/animal/day with increase in 0.32% fat and 0.17% SNF compare with check.

Impact

- KVK intervention such as FLD demonstrations, awareness programme, field day, training and diagnostic field visit in Vennanthur block of Namakkal district lead to effective changes in the feeding practices of livestock, especially during summer by feeding mulberry levels replacing with concentrates to reduce the cost of feeding and thus cost of production and also improved milk and meat production in dairy animals and small ruminants, receptively
- Mulberry leaves are available in plenty in this area, as most of the farmers are doing sericulture cultivation. So, farmers in this block felt that Mulberry leaves can be better utilised as an alternate green fodder @ 1-1.5kg/animal/day in small ruminants and @ 5kg/animal/day in dairy animals especially during summer, instead of wasting them.
- Every farmers from that blocks adopted that technology of utilizing mulberry levels for livestock feeding with better BCR.

19. INNOVATIVE METHODOLOGY OR TRANSFER OF TECHNOLOGY DEVELOPED AND USED DURING THE YEAR

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 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 (PPP Mode).

S.No	Methodology	Total qty of Seed / Planting material supplied	Amount realised (Rs.)	No. of farmers signed MOU	No. of farmers benefitted
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) – **25697 kgs** **Cumbu Napier grass – 98400 Slips**	11100932.00 73800.00	67	13212

20. ITKs

Indigenous technology practiced by the farmers in the KVK operational area which can be considered for technology development (in detail with suitable photographs)

S. No.	Crop / Enterprise	ITK Practiced	Purpose of ITK
		Nil	

21. IMPACT OF KVK ACTIVITIES (NOT TO BE RESTRICTED FOR REPORTING PERIOD).

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)	3245	74	33400/ha	48450/ha
Drought tolerant Groundnut varieties CO.7, GJG-9, Dharani	145	34	61450/ha	84560/ha
Castor cultivation as pure crop	425	76.2	31550/ha	48750/ha
Fodder cultivation & seed production	57	36	74400/ha	152500/ha
Hybrid Tomato cultivation	173	22	28000/0.4 ha	45000/0.4 ha
Seed propagated small onion/Aggregatum onion var.Co(On)5	264	30	60000/0.4 ha	82000/0.4 ha
Jasmine	87	5	43000/0.4 ha	70000/0.4 ha
Flower cultivation with new variety and technologies	726	20	37000/20 cent	54000/20 cent
Popularization of CTCRI Tapioca varieties in Namakkal District	1248	17	42000/0.4 ha	60,000/0.4 ha
Split application of fertilizers in jasmine	78	23	464495	564028
Foliar application of cotton plus in cotton with ICM practice	102	42	76000	86000
Application of Arka microbial consortia in tomato	43	12	129095	1765579
Folair application of IIHR formulated banana booster with ICM practice	123	54	98000	133000
Application of waste decomposer for decomposition	97	18	-	13,0000
Banana-cowpea intercropping with ICM practice	18	25	96,500	145092
Scientific desi chicken rearing	1250	95	6000	20000

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

The following impact study was carried out by the KVK during 2019-20

Table.1. Impact study of KVK activities

S.No.	*Particulars*	*Impact*
1	Cluster Front line demonstration on pulses and Oilseeds	❖ CFLD Demonstration on Pulses was conducted in an area of 100 ha (250 farmers) and Groundnut in an area of 65 ha (162 farmers) during 2016-2018 through NFSM. ❖ Due to CFLD Demonstrations, 26 farmers (10.4 ha) involved Green gram (Variety: CO-8) foundation and certified seed production in collaboration with KVK and Agricultural department. So far 7250 kgs seeds procured from farmers by Agricultural department and 600 kgs of seeds procured by KVK, Namakkal during 2019 and

		fetched higher market price @ Rs.96/kg (local market price Rs.55) and received high farm income. ❖ 15 farmers involved Groundnut (Co-7, GJG-9) certified seed production in collaboration with Agricultural department. So far 5150 kgs seeds procured from farmers by Agricultural department and 850 kgs of seeds procured by KVK, Namakkal during 2019 and fetched higher market price @ Rs.108/kg (local market price Rs.68) and received high farm income. ❖ 36 farmers (18 ha) cultivating Castor as a pure crop under irrigated as well as rainfed condition with less input cost and received optimum farm income. ❖ Now 32.5 % of the total area covered by CO-8 Green gram variety and 28.2 % of the total area covered by VBN-6 Black gram variety in the district due to CFLD Demo during 2019.			
2	Training programme	❖ Out of 12 trainings conducted on "soil and water testing" from 2016-2019 with 254 trainees,19% farmers started doing soil & water testing at KVK soil lab. ❖ 7 farmers started using coconut tonic to control button shedding in coconut after attending 2 training programmes in last two years ❖ 31 % farmers initiated to apply waste decomposer as soil & foliar application to all crops and composting of crop residues after attending composting training held on 19.11.2019 with 20 trainees.			
3	Regular advisories	❖ Out of 26 farmers received advisories, 12 farmers producing vermicompost production in small scale convergence with DRDA department ❖ 125 farmers started application of NCOF waste decomposer for composting, soil application and foliar application from 2018 October onwards.			
4	Diagnostic field visit				
	Crop & Date of visit	**Name of the farmer**	**Problem**	**Recommendation**	**Status and yield**
I	**Hybrid Maize cultivation** 28.08.2019	Tmt.Padmini Marakadu village of Mohanur block	25 days old crop infected by maize fall armyworm (var:NK6250)	Foliar spray of Emamectin benzoate @ 0.4g/litre of water and followed by Coragen @ 0.5ml/litre of water and fertigation with water soluble fertilizer.	Crop was saved and achieved higher grain of 7217 kg/ha & sold @Rs.23/kg *(average yield of the district is 7050 kg/ha)
II	**Tapioca** 24.08.2019	Th. Nasekethan Kalkurichi village	Tapioca mealy bug severely infected field (variety: Burma	Release of egg parasitoids- *Acerophagus papaya* @ one	Further spread of Mealy bug pest was controlled and

		Namagiri pettai block	rose)	vial per village (100 numbers) to control the mealy bug without any chemicals application	achieved average tuber yield. Yield: 4.87 ton/acre & sold @Rs.7.0/kg *(average yield of the district is 12.0 t/acre)
III	**Pomegranate** 3.7.19	Th.K.Subramani, Melsatham pur Paramathy block	four years old Pomegranate (var.Bagawa) field affected by wilt and dry root rot	Drenching and foliar application of fungicides @ monthly interval for 5 times and soil application of *T.viride* and *P.fluorescence* each 50 gm along with 10 kg of FYM	Status: crop recovered from dry root rot Yield: 3.5tonnes/ acre & sold @Rs.70/kg (average yield of the crop is 8.0 tons/acre)
IV	**Curry leaf** 21.08.19	Th.Vaitheeswaran, Selleyayeepalayam, Kalangani	stunted, uneven growth, lower leaf drying	ICM and INM practices	Problem corrected and farmers harvested 400 kg in 2.6 acres of land
5	Awareness programmes (World soil health day (05.12.2015 on wards)	❖ 1758 farmers, students and extension officials got awareness about soil fertility improvement. ❖ Since Govt motivated the farmers to buy fertilizers in shopsby showing soil health card based recommendation, almost all farmers are in practice now.			
6	ASCI - Skill development training programme on Bee Keeping and Mushroom grower	❖ **Bee keeping** No.of farmers trained: 20 No.of farmers started apiculture: 7 ❖ **Mushroom grower** No.of farmers trained: 20 No.of farmers started mushroom cultivation: 6			

Impact study on DFI Villages during 2018-19

With a view to developing models for bringing about doubling the farmers income in agriculture and socio-economic transformation among the villages in a sustained manner in Namakkal district, three villages *viz;* Ondikadai and Moolakadu were selected from Namagiripettai and

Vennandhur blocks respectively. Baseline survey was conducted along with Focus Group Discussion with the farmers of that village. Based on the survey results certain intervention has been introduced in the village to increase the income of farmers. The interventions were selected based on to reduce the input cost, increase the income and sustain the income in agriculture. Totally 170 farmers, one Farmers Producers Organization, and five landless labourers were selected to introduce the interventions with a budget of Rs.7.38 lakhs. The impact was assessed by all SMS in terms of recommended parameters and change in income.

Table.2.Impact study on DFI Villages during 2018-19

Interventions	*Farmers category*	*Agriculture (Rs.)*		*Horticulture(Rs.)*		*Livestock(Rs.)*		*Secondary source(Rs.)*		*Total(Rs.)*	
		Before	***After***	***Before***	***After***	***Before***	***After***	***Before***	***After***	***Before***	***After***
Intercropping in banana fields Reduction in two weeding cost (Rs.5000/ha) Reduction in 25% chemical fertilizers cost (Rs.1100) Reduction in farm yard manure cost (Rs.9000) Additional income through increase in bunch weight and no .of hand/bunch (Rs.80/bunch)	MF (7)			104566	178834					104566	178834
	SF (7)			114567	214672					114567	214672
	LF (4)			141928	258743					141928	258743
CFLD-High yielding groundnut varieties Var. GjG9, CO-7, TCGS-1073. Seed production, higher farm income, more haulm yield	MF(14)	49500	60500							49500	60500
	SF(15)	51950	64625							51950	64625
	LF(10)	55500	68750							55500	68750
OFT / FLD – Introduction of high yield castor hybrids as pure crop under rainfed and irrigated condition. Higher grain yield, less labour required, east management and fetched higher market price.	MF(20)	28220	42010							28220	42010
	SF(15)	31550	48750							31550	48750
	LF(10)	33450	55625							33450	55625
Introduction of high Value crops - French bean var. ArkaSharath Preference and farm gate price was high @Rs.40/kg Less incidence of pest and disease and Expenditure towards P&D management : Rs.1000/20 cent Low cost involved (Rs.2800/ 25 cent) for intercultural operations when compared to Hybrid tomato Yield of 5 q /20 cents in short duration (90 days)	MF(3)			9900	22500					9900	22500
	SF(12)			10150	23000					10150	23000
	LF(5)			9350	23700					9350	23700
Prevention of mastitis by mastiguard Increase in milk yield of o.75– 1.5 lt/day @ Rs. 20 – 32/lt Reduction in occurrence of mastitis and treatment cost of Rs.2000/animal/time	MF(5)					4500	17620			4500	17620
	SF(4)					9600	24300			9600	24300
	LF(1)					12000	24800			12000	24800

Garden land IFS Model - Crops + dairy + Poultry + Vermicompost + Fodder crops + Honey bee	MF(2)	72400	124300							72400	124300
	SF(2)	75600	128400							75600	128400
	LF(2)	76100	134100							76100	134100
Use of bio energy Expenditure towards gas cylinder : Rs.9600 (12 nos/year @Rs.800/cylinder) Cost saving Rs.9600/year Manure – 18500/year (6 tractor loads of manure/year @ 3 tonnes/ tractor load)	SF (1)							-	28100	-	28100
Shade net unit - Area – 500 sq.m Harvested 1100 bundles of coriander in 40 days under open field condition with poor germination percentage (65%) in harsh climate Harvested 1400 bundles in 35 days under shade net condition during off season & regular season	1			5500	7000					5500	7000
Livelihood support for five land less women 2 Wet grinding machine -Ondikkadai Rs.7/kg - 4 days/week 2 (Wet grinding at Moolakadu) 1 dairy animal Rs.8/litreX10months X21								3000 7400 3000	5500 11500 22,910	3000 7400 3000	5500 11500 22,910

22. 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 & bio-fertilizers
Tamil Nadu Veterinary and Animal Science University	Technical guidance, Supply of Mineral mixture, Grama priya and Vanaraja chicks, Namakkal chicken 1, Extension farm literatures both in print and CDs, Exposure visit.
Tamil Nadu Dr.J.Jayalalitha Fisheries University	Technical guidance, Supply of recent fish seeds and raceway culture technology
Indian Institute of Oilseeds Research, Hyderabad	Getting castor seeds for OFT programmes
Indian Institute of Horticulture Research, Bangalore	Purchase of vegetable seed and planting materials of flower crops.
CTCRI,Tiruvananthapuram	Technologies relevant to tuber crops and purchase of planting materials of tuber crops.
National Research Centre for Banana,Trichy	Technologies relevant to Banana production
Indian Institute of Spices Research,Calicut	Technologies relevant to spice crops and purchase of planting materials of spice crops
Central Institute of Brackish Aquaculture, Chennai	Technologies relevant to shrimp and cage culture and purchase of probiotics & Seabass seeds for FLD pro
Central Institute of Fisheries Technology(CIFT), Cochin	Technologies relevant to fish value added production
Central Institute Of Freshwater Aquaculture(CIFA), Bhubaneswar, Odisha	To upgrade the knowledge about Finfish and ornamental fish breeding and rearing
CMFRI, Cochin	To upgrade the knowledge on Fisheries Extension activities
Regional Agricultural Research Station, ANGRAU, Tirupati, Andhra Pradesh	Getting groundnut seeds for CFLD programmes
Regional Agricultural Research Station, ANGRAU, Nandyal, Andhra Pradesh	Getting foxtail millet seeds for OFT programmes
Regional fodder station, Alamathy, Chennai	Getting fodder seeds for PPP Mode programme
HC& RI,TNAU,Coimbatore & Periyakulam	Purchase of vegetable seed and planting materials of fruit crops.
NFDB, Hyderabad	Sponsoring agency for training programmes
National Seeds Corporation, GOI, Trichy	Getting groundnut seeds for CFLD programmes
Translational Research Platform in Veterinary Biologicals(TRPVB),TANUVAS	Technical partner for purchase of Mastiguard
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.
Agricultural Technology Management Agency	Partner in capacity building Programme
National Innovation Foundation, DST, New Delhi	Technical partner and Knowledge Sharing in the field of EVM
Department of Horticulture, Namakkal District	Technical review and participation in programmes
NABARD,Chennai	Sponsoring agency for CAT programmes & Research projects
MYRADA KVK, Erode	Supply of horticultural crop boosters
KVK,Karur	Expertise sharing towards Processing of Fruits and vegetables
KVK, Tumakuru	Exposure visit – NICRA activities
KVK, Davangere	Exposure visit – NICRA activities
KVK, Pudhucherry	Technical guidance, Supply of bio inputs,
Pest Control of India	Technical guidance, Supply of bio kid for pest and disease management
Department of Forestry, Namakkal	Planting of tree sapling with convergence mode for promoting Agro Silvipasture Model.
Tamilnadu Fisheries Department,Krishnagiri,	Purchase of GIFT Tilapia, Carps seeds seeds & Training

Nagapattinam and Mettur	Technologies relevant to Fish and shrimp
Tamil Nadu Livestock Development Agency	Financial partner for dairy farmer orientation Programme
Department of Animal Husbandry	Joint implementation in livelihood progrmmes
Tamil Nadu Co-operative Milk Producers' Federation Limited (Aavin)	Partner in dairy farmer knowledge management

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	11,55000.00
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, 2019	NFSM through ICAR-ATARI, Hyderabad	4,68,000.00
Cluster FLD on Oilseeds	June, 2019	NMOOP through ICAR-ATARI, Hyderabad	5,91,200.00
Paramparaghat Krishi Vikas Yojana (PKVY) Scheme	August 2019 to till date	ICAR,PKVY,Hyderabad	3,30,000.00
Incubation centre for sustainable small holder livestock and poultry production to enhance the livelihood of small farmers by integrated livestock farming	Since July 2019 to till date	NABARD,Chennai	9,76,000.00

FARMERS FIELD SCHOOL (FFS) ON PESICIDE RESIDUE FREE TOMATO PRODUCTION

Place: Moolakaadu **Block: Vennanthur**

Total trainees: 25 farmers **Season: –** Rabi – 2019-20

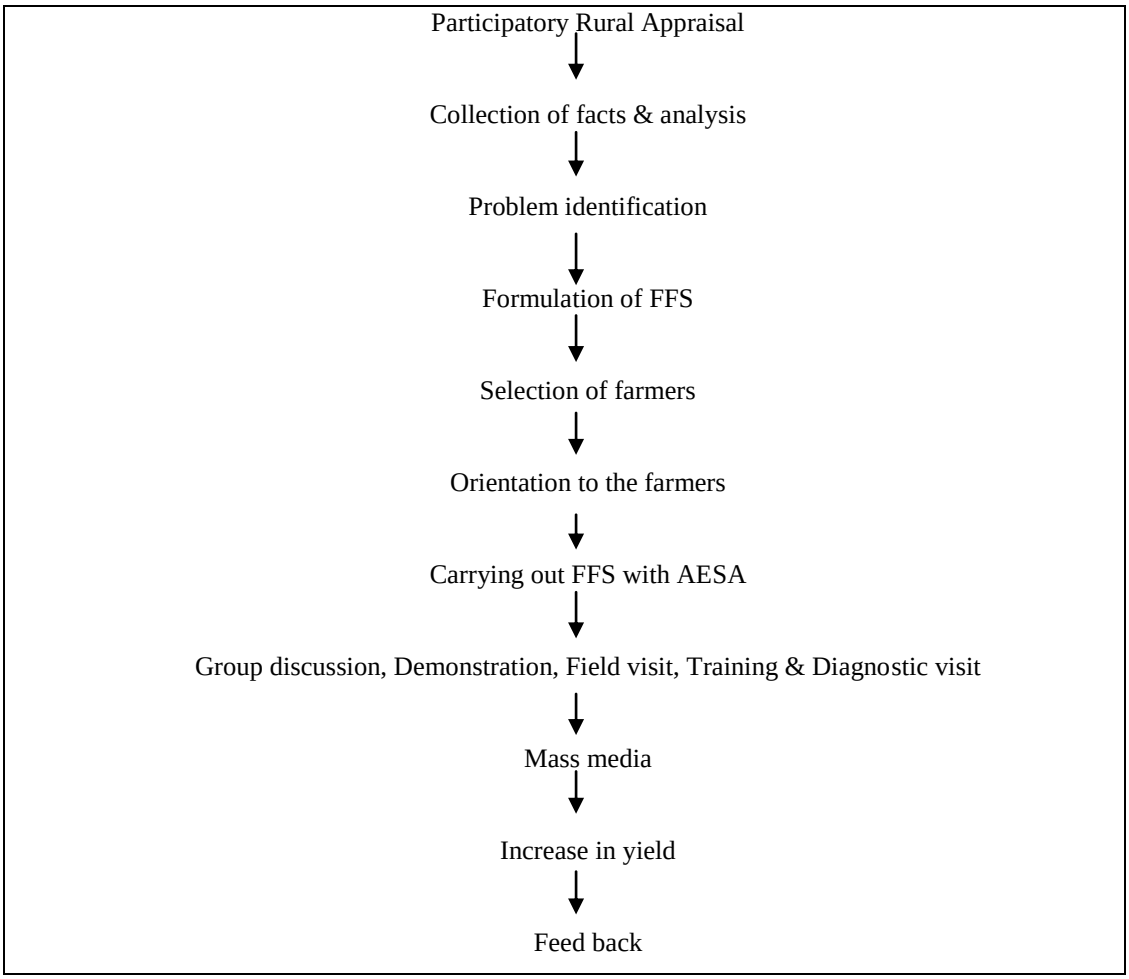
Scenario of Moolakaadu

- Area under Tomato cultivation in Moolakaadu village : 38.0 ha
- Name of Zone : North Western Zone
- Farming situation in the dist. : Irrigated (Rabi)
- Rainfall : 264 mm
- Maximum Temperature : 32.18º C
- Minimum Temperature : 18.44 º C
- Relative Humidity : 90.58 % to 68.75.%
- No. of Rainy days : 24 days
- Production (average) :684 quintol /ha
- Soils : Clay loam,
- Existing Cropping pattern : Tapioca – Tomato

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 tomato local practices adopted in terms of irrigation, use of fertilizer, plant protection, problems exists in tomato, 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 pesticide residue production technologies in tomato. 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 tomato. Demonstrations were conducted in step by step manner from seed treatment with bio fertilizers, raising seedlings, raising portray method of seedling, manuring, micronutrient application, pest and disease diagnosis etc., in order to educate them in all the required aspects with AESA



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

Problems identified

- Mono cropping of Tapioca
- Seed treatment for disease management is not followed
- Maintenance of poor plant population
- Poor weed management
- Indiscriminate use of inorganic fertilizers
- Lack of knowledge on micronutrient management
- Lack of knowledge on biological control of pest and diseases
- 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
- Climatic requirement and tomato plant characters & Physiology
- Tomato hybrid (Sivam) seedlings recommended

- Demonstration of Seed treatment (*P. fluorescense*)
- Basal application of Vermicompost @ 500 kg/ ha.
- Neem cake application @ 250 kg/ ha as basal to control soil borne diseases
- Soil application (*P*seudomonas *fluorescens* 2.5 kg/ha) on 30 DAS
- Setting up of Pheromone trap @ 12/ ha for *Heliocoverpa armegra* fruit borer, *Spodoptera litura* tobacco cut worm & leaf miner in crop
- Setting up of Yellow Sticky trap @ 12 nos./ha
- Border trap crop –Marigold and once in 15 rows
- Need Based application of NSKE 5%
- Tomato, Planting method & population maintenance .
- Installation of Yellow sticky Trap, Pheromone trap, solar light trap & its importance
- Water &organic manure management (Poultry manure)
- Micro Nutrient Management
- Preparation & Usage of Botanical pesticide (Neem, Garlic & Ginger, Panchakavya, pest repellent and *Beauveria bassiana*)
- Effects of pesticide on predators & parasites
- Post harvest technology

Annexure – I
(CURRICULAM FOR ELEVEN SESSIONS)

S. No	Sessions and Date	Activities	Facilitators/Resources Persons
1	I (21.10.2019)	➢ Recapitulation ➢ Group formation & discussion ➢ Field walk ➢ Collection of flora & Fauna in the Tomato eco system ➢ segregation of Pests & Defenders **Special Topic** ➢ Climatic requirement and tomato plant characters & Physiology ➢ Application of organic manure and bio fertilizer ➢ Planning for Next Session	Entomologist
2	II (28.10.2019)	➢ Recapitulation ➢ Introduction to Agro Eco Systems Analysis(AESA) **Special Topic** ➢ Tomato hybrid –Sivam, Planting method & population maintenance approach for seedling diseases management ➢ Foliar spray of pest repellent to control of sucking pest ➢ Planning for Next Session	Entomologist
3	III (5.11.2019)	➢ Recapitulation ➢ Agro Eco System Analysis(AESA) ➢ Observation, Drawing & Presentation **Special Topic** ➢ Installation of Yellow sticky Trap, pheromone trap, & its importance ➢ Spraying of panchakavya and pest repellent ➢ Planning for Next Session	Entomologist
4	IV (18.11.2019)	➢ Recapitulation ➢ Agro Eco System Analysis(AESA) Observation, Drawing & Presentation **Special Topic** ➢ IDM in Tomato ➢ Planning for Next Session	Entomologist

5	V (25.11.2019)	➢ Recapitulation ➢ Agro Eco System Analysis(AESA), Observation, Drawing & Presentation **Special Topic** ➢ Water & Fertilizer management ➢ Planning for Next Session	Entomologist
6	VI (3.12.2019)	➢ Recapitulation ➢ Agro Eco System Analysis (AESA), Observation, Drawing &Presentation ➢ Comparison on FFS- Non FFS field **Special Topic** ➢ Micro Nutrient Management ➢ Planning for Next Session	Entomologist
7	VII (11.12.2019)	➢ Recapitulation ➢ Agro Eco System Analysis (AESA) – Observation, Drawing & Presentation ➢ Release of Egg Parasitoids **Special Topic** ➢ Preparation & Usage of Botanical pesticide (Neem, Garlic & Ginger, Panchakavya, pest repellent) ➢ Planning for Next Session	Entomologist,
8	VIII (8.1.2020)	➢ Recapitulation ➢ Agro Eco System Analysis (AESA) ➢ Observation, Drawing & Presentation **Special Topic** ➢ Effects of pesticide on predators & parasites ➢ Planning for Next Session	Entomologist
9	IX (15.01.2020)	➢ Recapitulation of all sessions activities ➢ Comparison of FFS & Non-FFS field **Special Topic** ➢ Post harvest technology ➢ Evaluation	Entomologist
10	X (23.01.2020)	➢ Recapitulation ➢ Agro Eco System Analysis (AESA) ➢ Observation, Drawing & Presentation **Special Topic** ➢ Post harvest and evaluation of Yield ➢ Discussion with farmers	Entomologist

Group meeting

Before commencement of the regular session in FFS, group meeting was organized during the season. Discussion was made on the importance of pesticide residue management and 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 groups were organized to allotted field for demonstration, application and bio-agents.

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 and disease incidence on Tomato with AESA

S.No	Name	Scientific Name	Crop stage	Status	
				FFS	Non FFS
1	Aphids	*Myzuspersicae*	Seedlings and Vegetative phase	Minor	Major
2	Thrips	*Scirtothripsdorsalis*	Vegetative phase	Minor	Major

3	Fruit borer	*Helicoverpa armegra*	Vegetative and fruit formation	Minor	Major
4	Tobacco cutworm	*Spodopteralitura.*	Vegetative and fruit formation	Minor	Major
4	Mite	*Polyphagotarsomenulatus*	Vegetative phase	Minor	Major
5	Damping off	*Phythiumaphanitermatum*	Vegetative phase	Minor	Major
6	Whitefly	*Bemisia tabaci*	Vegetative – harvest	Minor	Major

B. Observation on Natural Enemies on Tomato 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.	Preying mantis	Soft bodied insects
6.	Wasps	Soft bodied insects

C. Impact of FFS

Farming situation	Hybrid		No. Farmer	Area (ha)	Average fruit yield 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	Sivam	Sivam	25	0.4	725.50	634.70	14.3	626832	605503.8	2.08	1.88

***sold the tomato fruit @ Rs. 18/ kg**

D. Pesticide Reduction:

Sl. No.	Name of village	No. of Spray/ha		Cost of Spray (Rs./ha)		Reduction in Cost of spray by residue free Tomato 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	Moolakaadu	0	3	0			679068	536956

E. Parameters observed with AESA

S.No.	Parameters	FFS	Non FFS
1	Plant height (cm)	83.2	72.6
2	No of fruits per plant	43	36
3	Yield (q/ha)	725.5	634.7
4	Cost of cultivation/ha	626832	605504
5	Gross income/ha	1305900	1142460
6	Net income/ha	679068	536956
7	B.C. Ratio/ha	2.08	1.88
8	Yield Increased (%)		14.3.0%

ICAR- Krishi Vigyan Kendra, Namakkal have successfully conducted FFS Programme at Moolakaadu village on Dr. K.R. Pushpanathan, Assistant Professor (Plant Protection), Krishi Vigyan Kendra, Namakkal FFS and non FFS farmers were participated in this function.

Feedback:

- Farmers expressed that due to the demonstration of organic based insect pest management with production technologies through FFS, they got increased yield. The crop followed by the packages along with pest management by biological method controlled the pest and diseases, produced more flowers and beared fruits continuously with stabilized market rate which received higher farm income.

- Better price for vegetable was noticed for tomato cultivated with limited area and also less competition in the market.

Feedback from farmers under FFS

- As farmers gathered the technical assistance in time. This in turn helps us to get higher yield without much of loss.
- This created awareness of organic based crop production to improve the fertility status of the soil and get higher yield.

Utilization of budget

Sl. No	Items	Total amount (Rs.)
1	Refreshment @ Rs. 20/- trainee for 8 number of programmes (25x20x8)	4000.00
2	Contingents expenditure, Banners for inaugural function of FFS	350.00
3	Distribution of i)Purchase of marigold @ 400 numbers ii) Cost of training input materials –Bio inputs, Bio pesticides, seeds, Bio fertilizers iii) Cost of pheromones/bio pesticides, emergency spray. Other relevant IPM literature iv) Application of Poultry manure @ 5 tonnes/ ha. (Contributed by farmers) vi) Setting of light trap and sex pheromone trap of *Helicoverpa armegra*, *Spodoptera litura* & leaf minor lure @ 15 nos./ ha. each vii) Neem cake application @ 250 kg/ ha. viii) Spraying of Neem oil @ 5 ml/litre once in 15 days interval ix) Spraying of *Beauveria bassiana @2 ml/ litre* as an when noticed of pest x) Setting of Yellow sticky trap @ 8 numbers per acre. (	 1500.00 500.00 300.00 1050.00 1000.00 400.00 300.00 500.00
4	Distribution of Pesticide residue tomato production literature to trainees	-
	Total	**9800.00**

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