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ICAR

Zonal Project Directorate (Zone-V)

CRIDA, Santoshnagar,
Hyderabad-500059 A.P.

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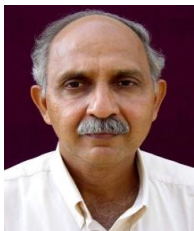
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PREFACE

The Zonal Project Directorate (Zone-V) with its headquarter situated at CRIDA Campus, Santoshnagar, Hyderabad is vested with responsibility of monitoring various transfer of technology projects funded by the Council in two states viz. Andhra Pradesh and Maharashtra.

At present there are 70 KVKs in the zone, including 30 in Andhra Pradesh and 40 in Maharashtra. During the year, KVKs assessed and refined 463 technologies through 3909 on-farm trials. A total of 9277 Front Line Demonstrations covering 3038.96 ha under oilseeds, pulses and other field and horticultural crops was organized by KVKs in Zone-V.

KVKs organized 4793 training programmes covering 148310 participants that include 115240 farmers and farmwomen, 18677 rural youth and 14393 extension functionaries besides organizing 15983 extension activities with a participation of 1776347 farmers, farmwomen and extension personnel. In order to accelerate rapid dissemination of information on improved farm technologies, KVKs brought out 1059 publications. KVKs also produced 7566.14 q of seed and 1414800 saplings of elite species of field and horticultural crops.

In order to ascertain the soil health and to make crop specific nutrient recommendations in the prevailing micro-farming situations, KVKs analyzed 72167 samples benefitted 50299 farmers and farmwomen belonging to 7827 villages in Andhra Pradesh and Maharashtra. Apart from this, about 30054 farmers were given direct access to institutional resources through six Agricultural Technology Information Centres in Zone-V. A total of 29 HRD activities benefitting 1233 KVK staff in the Zone were jointly organized by the five directorates of extension and the ZPD (Zone-V).

I express my gratitude to Dr. S. Ayyappan, Secretary, DARE and Director General, ICAR, Dr. K. D. Kokate, Deputy Director General (AE), Dr. A. K. Mehta, Assistant Director General (AE) and Dr. V. Venkatasubramanian, Assistant Director General (AE) for their continued guidance and support in implementing the mandate.

I am thankful to Dr. K. Dattatri, Principal Scientist, Dr. K. Mahadeva Reddy, Senior Scientist, Dr. G. Rajender Reddy, Field Officer, Mrs. S. Hemalatha, Personal Assistant and Mrs. Navaneetha, Lower Division Clerk for their pain taking efforts in analyzing huge data, preparing manuscript and bringing out the Annual Report.

N. Sudhakar
Zonal Project Director

EXECUTIVE SUMMARY

Indian Council of Agricultural Research upgraded the Zonal Coordination Unit to the status of Project Directorate during 2009. The mandate of Zonal Project Directorate is to formulate, implement, monitor and evaluate various strategies on technology assessment, refinement and demonstration mainly through Krishi Vigyan Kendras in Zone-V that includes Andhra Pradesh and Maharashtra states.

At present there are 70 KVKs in the zone which include 30 in Andhra Pradesh and 40 in Maharashtra. Out of 30 KVKs in Andhra Pradesh 20 are with State Agricultural Universities (SAU), 2 with ICAR institutes and 8 with Non-Governmental Organizations (NGO). In Maharashtra, 15 KVKs are with SAUs, 1 with ICAR institute, 23 with NGOs and 1 with Open University.

During the year, KVKs assessed and refined 463 technologies by laying out 3909 on-farm trials. Out of 463 technologies tested, 328 technologies were assessed and refined on crops followed by the technologies related to women and children (64) and animals (71). The main thematic areas covered in case of animals are fertility management, feed and fodder management, nutrition management, evaluation of breeds, disease management, production and management and breed improvement, while in case of crops the thematic areas include varietal evaluation, integrated pest management, integrated nutrient management, resource conservation technologies, integrated farming systems, weed management, integrated disease management and seed and planting material production. Under empowerment of rural women the on-farm trials were conducted in thematic areas viz. health and nutrition, drudgery reduction and entrepreneurship development.

KVKs in Andhra Pradesh assessed 161 technologies by conducting 916 on-farm trials, while KVKs in Maharashtra assessed 228 technologies by organizing 2375 trials. A total of 18 technologies were refined by KVKs in Andhra Pradesh by organizing 119 trials and KVKs in Maharashtra conducted 499 trials to refine 56 technologies.

A total of 1201 front line demonstrations covering 505.50 ha under oilseeds were organized by KVKs in Zone -V. The major oilseed crops that were covered under demonstrations include groundnut, soybean, castor, sesamum, sunflower and safflower etc. In case of pulses, KVKs organized 2591 demonstrations covering 1099.06 ha during kharif and rabi seasons. The major crops covered under demonstrations are redgram, bengalgram, greengram, blackgram etc. Similarly, KVKs in Andhra Pradesh and Maharashtra organized 3508 demonstrations covering 1353.40 ha on other crops i.e. cereals, commercial crops, fodder and horticultural crops. KVKs also organized 1977 demonstrations on improved tools and implements, 1256 and 1983 demonstrations on livestock species and empowerment of women respectively.

Training is an important activity of KVK, which play a pivotal role in enhancing the knowledge and skill about various improved technologies.

During the year, KVKs in Zone-V organized 4793 training programmes covering 148310 participants that include 115240 farmers and farmwomen, 18677 rural youth and 14393 extension

functionaries. KVKs in Andhra Pradesh organized 1755 training courses with a participation of 50408 farmers including farmwomen, rural youth and extension functionaries, while the KVKs in Maharashtra conducted 3038 courses with a total of 97902 beneficiaries. The main thematic areas covered under training include integrated crop management, improved tools and implements, capacity building and group dynamics, women empowerment, improved production practices for horticultural crops, productivity enhancement in livestock species, integrated pest management and soil health and fertility management.

KVKs in Zone-V also organized 489 sponsored training programmes covering 24650 farmers and farmwomen and rural youth. In order to facilitate entrepreneurship development, income generation and self-employment especially among rural youth and school dropouts, KVK organized 364 vocational training programmes covering 9284 beneficiaries. The important thematic areas include value addition, integrated crop management, poultry farming, nursery and grafting, production of bio-agents and bio-pesticides, sheep and goat rearing etc.

To create awareness on improved agricultural technologies the KVKs of Zone-V organized 15983 extension activities with a participation of 1776347 farmers, farmwomen and extension personnel. The extension activities included advisory services, exposure visits, animal health camps, technology week, group discussions, method demonstrations, soil health camps, kisan melas, kisan ghosti, etc. In order to accelerate rapid dissemination of information on improved farm technologies, KVKs in Zone-V brought out 1059 publications. KVKs also supplied 7566.14 q of seed and 1414800 saplings of elite species of field and horticultural crops to farmers.

KVKs also have undertaken soil and water testing to ascertain the soil nutrient status and also to make soil test based nutrient recommendations in the prevailing micro-farming situations in the district. A total of 72167 samples including 42695 of soil, 10290 of water, 835 of plant and 25 of petiole were analyzed by the KVKs that benefitted 50299 farmers belonging to 7827 villages in Andhra Pradesh and Maharashtra.

The Directorates of Extension Education of State Agricultural Universities and Zonal Project Directorate facilitate technological backstopping and Human Resource Development to the KVKs through training, seminars, workshop etc. A total of 29 HRD activities benefitting 12233 KVK staff in the Zone were jointly organized by the five directorates of extension and the Zonal Project Directorate.

To facilitate direct access of farmers to institutional resources, ICAR established six Agricultural Technology Information Centres in Zone-V with the objective of single window delivery of various technology products. During the year a total of 30054 farmers visited the six ATICs to know the latest technology information and to obtain critical technology products viz. seed and planting material.

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INTRODUCTION

Zonal Project Directorate

The National Organizing Committee constituted to celebrate the Golden Jubilee of the Indian Council of Agricultural Research (ICAR) during 1979-80 envisaged a massive programme viz. Lab to Land Programme for continuous flow of economically viable technology from laboratories to the farmers' fields. In this regard, it was decided to adopt 50000 small and marginal farmers and landless labourers throughout the country to transfer available farm technologies comprising of crop production, livestock farming, farm tools and implements, pisciculture, sericulture, apiculture etc. including crop-livestock integration and the same was implemented from September, 1979. In order to achieve the same, the country was divided into eight zones and as a result of this, the Zonal Coordination Unit for Transfer of Technology, Zone-V was established in September, 1979 as Cess Fund Scheme at Andhra Pradesh Agricultural University, Hyderabad primarily to monitor the activities of the Lab to Land Programme in the states of Andhra Pradesh and Maharashtra. Subsequently in 1985, the unit was shifted to the campus of Central Research Institute for Dryland Agriculture, Hyderabad. The Unit was given the responsibility of monitoring of Lab to Land Programme until 1986. Later during the year the unit was brought under the plan scheme of ICAR.

In 1987, the Council gave the unit additional responsibility of monitoring other ICAR supported Transfer Of Technology Projects viz. Krishi Vigyan Kendras (KVK), Trainers Training Centre (TTC), National Demonstration Scheme (NDS), Operational Research Projects (ORP), All India Coordinated Project on SC / ST (AICRP SC/ST) and Special Projects on Oilseeds that were implemented in the zone. During 1990 and 1991, the Front Line Demonstrations (FLD) on oilseeds under Oilseeds Production Programme (OPP) and pulses under National Pulse Project (NPP), farm implements and cotton are also being monitored by Unit. In 1995, a pilot project on Institute Village Linkage Programme (IVLP) was undertaken and implemented in the zone. In 1998, Zonal

Research Stations under the State Agricultural Universities (SAU) were strengthened to take up the additional functions of KVKs and these re-mandated KVKs are also monitored.

The X and XI Five Year Plan (FYP) period witnessed phenomenal growth of KVKs in the country including the establishment of new KVKs in Zone-V covering the states of Andhra Pradesh and Maharashtra. During XI FYP period, Council has approved establishment of 97 new KVKs which include establishment of 24 additional KVKs in geographically larger districts, 12 each in the states of Andhra Pradesh and Maharashtra. In view of this the Council has upgraded all the eight Zonal Coordination Units to the status of Directorates and thus Zonal Project Directorate (ZPD), Zone-V came into existence during the year 2009.

The Directorate has the following mandates

- To formulate, implement, monitor and evaluate strategies on technology assessment, refinement and demonstration programme of the Council in the zone
- To initiate, plan, coordinate and execute the extension research to support and improve technology dissemination system.
- To link KVK efforts to strengthen extension approaches viz. consortium, convergence, public-private partnership, farmer-led and market-lead extension in their respective regions.
- To coordinate the work relating to transfer of technology programme of the various agencies such as agricultural universities, ICAR institutes, state and central govt. agencies, financial institutions, affiliated agriculture and home science colleges, voluntary agencies and the transfer to technology centres in their respective regions.
- To serve as feedback mechanism for technology generations system

The Directorate falls under the administrative control of Division of Agricultural Extension of ICAR headed by the Deputy Director General (Agricultural Extension) who is assisted by the Assistant Director Generals, Principal Scientists, Senior Scientists and Deputy Secretary. The Zonal Project Directorate is headed by Zonal Project Director who is assisted by the Principal Scientists, Senior Scientists, Computer Programmer, Assistant Administrative Officer, Assistant Finance and Accounts Officer, Personal Assistant, Assistant, Junior Accounts Officer, Upper and Lower Division Clerks, a Driver and Supporting Staff. A modest infrastructure for smooth functioning of the Directorate was built in the campus of Central Research Institute for Dryland Agriculture, Santoshnagar, Hyderabad.

Krishi Vigyan Kendra

Krishi Vigyan Kendra (Farm Science Centers), an innovative science-based institution, was established to impart vocational skill training to the farmers and field-level extension workers. The need for vocational training in agriculture and allied fields through KVK grew substantially for catering to the increasing demand for improved/agricultural technology by farmers. The farmers not only require knowledge and understanding of intricacy of new technologies, but also more skills to adopt the

same in varied and complex field situation on their farms. In view of this, the role of KVK was further enhanced by adding the responsibility of on-farm testing and front-line demonstrations of major agricultural technologies to dovetail the same in location specific environment. In order to equip the present day farmers to face the challenges of information explosion and to bridge the digital divide, KVKs were given the other responsibility of acting as knowledge and resource centre of agricultural and allied technologies. The mandate of KVKs is,

- On-farm testing to identify the location specificity of agricultural technologies under various farming systems.
- Organize frontline demonstrations to establish production potential of technologies on the farmer's fields.
- Training of farmers to update their knowledge and skills in modern agricultural technologies and extension personnel to orient them in the frontier areas of technology development.
- To work as knowledge and resource centre of agricultural technology for supporting initiatives of public, private and voluntary sector for improving the agricultural economy of the district.

KRISHI VIGYANKENDRA

Status

At present there are 70 KVKs in Zone-V which include 30 in Andhra Pradesh and 40 in Maharashtra (Table 1). Of the 30 KVKs in

Andhra Pradesh, 20 are with SAU, two with ICAR institutes and 8 with Non-Governmental Organizations (NGO). In Maharashtra, 15 KVKs are with SAUs, one with ICAR institute, 23 with NGOs and one with Open University.

Table 1. Status of KVKs

State	No. of districts	No. of KVKs				Total
		SAU	ICAR	NGO	Others	
Andhra Pradesh	22	20	2	8	-	30
Maharashtra	33	15	1	23	1	40
Total	55	35	3	31	1	70

Staff

The details of staff position of different KVKs are given in Table 2. Out of 880 posts sanctioned in the Zone, 709 are filled (81%). The Programme Coordinators are in

position at 38 out of 55 KVKs in the zone, while the number of Subject Matter Specialists in position is 255 (77%) and the number of Programme Assistants is 116 (70%).

Table 2. Consolidated staff position

Category	Andhra Pradesh			Maharashtra			Total		
	S	F	V	S	F	V	S	F	V
Programme Coordinator	22	17	5	33	21	12	55	38	17
Subject Matter Specialist	132	92	40	198	163	35	330	255	75
Programme Assistant	66	41	25	99	75	24	165	116	49
Administrative Staff	44	50	-6	66	55	11	110	105	5
Auxiliary Staff	44	31	13	66	44	22	110	75	35
Supporting Staff	44	50	-6	66	70	-4	110	120	-10
Total	352	281	71	528	428	100	880	709	171

S : Sanctioned

F : Filled

V : Vacant

Infrastructure

In order to facilitate proper functioning of KVKs, modest infrastructure is provided by ICAR. The details of land, buildings, vehicles and other facilities are presented in Table 3. The

other infrastructure such as soil and water testing lab, rainwater harvesting structure and e-connectivity are being provided to only few selected KVKs, while the buildings and vehicles are provided to all the KVKs by ICAR.

Table 3. Details of infrastructure available with KVKs

State	Land (ha)			Buildings						DU	Vehicles		SWTL	RWHS	EL
				AB		FH		SQ			Jeep	Tractor			
	<10	10-20	>20	A	UP	A	UP	A	UP						
AP	1	9	12	21	1	19	3	17	2	22	22	22	18	1	12
MS	0	4	29	31	2	30		27	1	33	33	33	30	11	17
Total	1	12	41	52	3	49	3	44	3	55	55	55	48	12	29

AP : Andhra Pradesh; MS : Maharashtra; AB : Admn. Building; FH: Farmers Hostel; SQ: Staff Quarters; DU : Demo Unit; SWTL : Soil & Water Testing Lab; RWHS : Rain Water Harvesting Structure; EL : e-linkage; A : Available; UP: Under Progress

Revolving Fund

The total revolving fund generated by KVKs in the Zone is Rs. 391.79 lakh of which Rs.126.95 lakh is generated by KVKs in Andhra Pradesh and Rs. 264.84 lakh by KVKs in Maharashtra (Table 4).

Table 4. Status of revolving fund (Rs. in lakh)

State	OB	CB
AP	131.61	126.95
MS	190.53	264.84
Total	322.14	391.79

AP : Andhra Pradesh; MS :Maharashtra

OB : Opening Balance (01.04.2010)

CB: Closing Balance (31.03.2011)

In Andhra Pradesh, KVK Kurnool has the highest balance of revolving fund (Rs. 41.01 lakhs) followed by Nalgonda (Rs. 13.12 lakh) and Khammam (Rs. 11.76 lakh) and KVK wise fund position is furnished in Table 5 a. In Maharashtra, KVK Amaravati (D) has the highest balance Rs. 52.45 lakh followed by Jalgaon, Rs. 24.83 lakh and Beed, Rs. 17.19 lakh and KVK wise fund position is presented in Table 5 b.

Table 5 a. Status of revolving fund in KVKs of Andhra Pradesh (Rs. in lakh)

KVK	CB
Adilabad	1.18
Anantapur	3.43
Chittoor	9.59
East Godavari	0.71
Guntur	0.25
Kadapa	3.65
Karimnagar	3
Khammam	11.76
Krishna	7.62
Kurnool	41.02
Mahaboobnagar	0.79
Medak	1.71
Nalgonda	13.12
Nellore	4.41
Nizamabad	3.89
Prakasam	1.28
Ranga Reddy	0
Srikakulam	6.81

KVK	CB
Vishakapatnam	4.79
Vizianagaram	3.12
Warangal	4.29
West Godavari	0.53
Total	126.95

CB: Closing Balance (31.03.2011)

Table 5 b. Status of revolving fund in KVKs of Maharashtra (Rs. in lakh)

KVK	CB
Ahmednagar	12.07
Amaravati (D)	52.45
Amaravati (G)	1.41
Aurangabad	13.8
Beed	17.19
Bhandara	14.4
Buldhana	14.35
Chandrapur	1.47
Dhule	3.42
Gadchiroli	6.7
Gondia	16.89
Hingoli	1.86
Jalgaon	24.83
Jalna	4.52
Kolhapur	2.39
Latur	0.79
Nagpur	1.17
Nanded	0.42
Nandurbar	4.72
Nashik	2.36
Osmanabad	3.95
Parbhani	2.25
Pune	3.7
Raigadh	2.36
Ratnagiri	-0.01
Sangli	2.8
Satara	13.2
Sindhudurg	3.65
Solapur	1.3
Thane	11.52
Wardha	8.37
Washim	9.27
Yavatmal	5.27
Total	264.84

CB: Closing Balance (31.03.2011)

**Scientific Advisory Committee (SAC)
Meetings**

The number of SAC meetings conducted by KVKs is given in Table 6. Out

of 55 KVKs, 21 KVKs conducted SAC meetings once, while 23 KVKs conducted the meeting twice. The SAC meetings were not conducted by 11 KVKs.

Table 6. Details of SAC meeting conducted in Zone-V

State	No. of KVKs	No. of KVK			
		Once	Twice	Total	Not conducted
Andhra Pradesh	22	1	21	22	0
Maharashtra	33	20	2	22	11
Total	55	21	23	44	11

ACHIEVEMENTS

Technology Assessment and Refinement

KVKs play a key role in the assessment and refinement of technologies to location specific condition by organizing various on-farm trials. KVKs plan the trials based on problems in major crops/enterprises in the district. The problem identification and prioritization of thrust areas, planning, execution and evaluation of trials is the fundamental activity of KVKs. The details of thrust areas include,

- ❖ Yield optimization in field crops, fruits, vegetables and other commercial crops through improved varieties, integrated nutrient management and organic farming strategies
- ❖ Integrated pests and disease management in field and horticultural crops
- ❖ Scientific management of dairy and small livestock with appropriate feeding, breeding and health management practices
- ❖ Introduction of improved varieties/hybrids of crops
- ❖ Crop diversification and alternate land use systems
- ❖ Empowerment of women through improved nutrition and health, income generation and drudgery reduction
- ❖ Promotion of horticulture as a mechanism of crop diversification, augmenting family income and national income through export
- ❖ Natural resource management for sustainable productivity
- ❖ Value addition, processing and market facilitation of household and commercial

enterprises

- ❖ Soil and water conservation, watershed management for drought proofing and sustainable rainfed farming
- ❖ Small scale mechanization for saving time and reducing cost and drudgery
- ❖ Promotion of crop production technologies and integrated farm development strategies
- ❖ Increasing income from fishery enterprises through production, processing and marketing enhancing activities

During the year, KVKs have assessed and refined 463 technologies in different locations by laying out 3909 on-farm trials on the farmers' fields (Table 7). Out of 463 technologies tested, 328 technologies were assessed and refined on crops followed by animals (71), women and children (64).

The details on thematic area wise on-farm trials conducted by KVKs in Andhra Pradesh and Maharashtra are furnished in Table 8 to 10. The main thematic areas covered in case animals are fertility management, feed and fodder management, nutrition management, evaluation of breeds, disease management, production and management and breed improvement. In case of crops, the thematic areas include varietal evaluation, Integrated Pest Management (IPM), Integrated Nutrient Management (INM), resource conservation technologies, integrated farming systems, weed management, Integrated Disease Management (IDM) and seed and planting material production. Under empowerment of rural women, the on-farm trials were conducted in thematic areas viz., health and nutrition, drudgery reduction and entrepreneurship development.

Table 7. Details of technologies assessed and refined by KVKs

Particulars	State	Category	No. of technologies	No. of trials	No. of KVKs
Assessment	Andhra Pradesh	Animals	22	140	10
		Crops	129	681	22
		Women Empowerment	10	95	9
		Sub Total	161	916	
	Maharashtra	Animals	38	512	23
		Crops	142	1239	33
		Women Empowerment	48	624	24
		Sub Total	228	2375	
		Total	389	3291	
Refinement	Andhra Pradesh	Animals	5	36	2
		Crops	12	53	5
		Women Empowerment	1	30	1
		Sub Total	18	119	
	Maharashtra	Animals	6	49	6
		Crops	45	378	20
		Women Empowerment	5	72	4
		Sub Total	56	499	
		Total	74	618	
Assessment & Refinement	Andhra Pradesh	Animals	27	176	12
		Crops	141	734	22
		Women Empowerment	11	125	9
		Total	179	1035	
	Maharashtra	Animals	44	561	23
		Crops	187	1617	33
		Women Empowerment	53	696	26
		Total	284	2874	
	Grand Total		463	3909	

Table 8. Details of thematic area wise technologies assessed and refined by KVKs

Category	Thematic area	No. of technologies	No. of trials	No. of KVKs
Animals	Breed Evaluation	5	41	5
	Breed Improvement	2	11	2
	Disease Management	11	251	10
	Feed and Nutrition Management	30	212	22
	Fertility Management	13	145	11
	Production and Management	10	77	10
	Total	71	737	
Crops	Cropping Systems	21	111	16
	Farm Machinery	25	189	14
	Growth Regulators	19	145	16
	Integrated Crop Management	27	188	20
	Integrated Disease Management	22	109	16
	Integrated Nutrient Management	53	402	34
	Integrated Pest Management	61	470	34
	Integrated Weed Management	12	127	11
	Resource Conservation	8	49	6
	Seed and Planting Material Production	5	40	5
	Soil and Moisture Conservation	9	81	9
	Varietal Evaluation	66	440	31
	Total	328	2351	
Women Empowerment	Entrepreneurship Development	3	25	3
	Health and Nutrition	31	502	24
	Drudgery Reduction	30	294	23
	Total	64	821	
Grand Total		463	3909	

Table 9. Details of thematic area wise assessment of technologies by KVKs

Category	Thematic area	No. of technologies	No. of trials	No. of KVKs
Animals	Breed Evaluation	5	41	5
	Breed Improvement	2	11	2
	Disease Management	9	229	9
	Feed and Nutrition Management	24	179	20
	Fertility Management	11	119	10
	Production and Management	9	73	9
	Total	60	652	
Crops	Cropping Systems	20	105	15
	Farm Machinery	24	184	14
	Growth Regulators	16	109	13
	Integrated Crop Management	23	163	18
	Integrated Disease Management	15	73	12
	Integrated Nutrient Management	35	250	26
	Integrated Pest Management	46	356	28
	Integrated Weed Management	9	101	9
	Resource Conservation	6	37	5
	Seed and Planting Material Production	3	28	3
	Soil and Moisture Conservation	8	74	8
	Varietal Evaluation	66	440	31
	Total	271	1920	
Women Empowerment	Entrepreneurship Development	3	25	3
	Health and Nutrition	25	400	21
	Drudgery Reduction	30	294	23
	Total	58	719	
Total		389	3291	

Table 10. Details of thematic area wise refinement of technologies by KVKs

Category	Thematic area	No. of technologies	No. of trials	No. of KVKs
Animals	Disease Management	2	22	2
	Feed and Nutrition Management	6	33	5
	Fertility Management	2	26	2
	Production and Management	1	4	1
	Total	11	85	
Crops	Cropping Systems	1	6	1
	Farm Machinery	1	5	1
	Growth Regulators	3	36	3
	Integrated Crop Management	4	25	4
	Integrated Disease Management	7	36	4
	Integrated Nutrient Management	18	152	14
	Integrated Pest Management	15	114	10
	Integrated Weed Management	3	26	3
	Resource Conservation	2	12	1
	Seed and Planting Material Production	2	12	2
	Soil and Moisture Conservation	1	7	1
	Total	57	431	
Women Empowerment	Health and Nutrition	6	102	5
	Total	6	102	
Total		74	618	

KVKs in Andhra Pradesh assessed the suitability of 161 technologies by conducting 916 on-farm trials covering animals (140), crops including horticultural species (681) and empowerment of rural women (95). Similarly, in case of Maharashtra KVKs assessed 228

technologies by organizing 2375 trials that include animals (512), crops including horticultural species (1239) and women empowerment (624). The state wise details of technologies assessed by KVKs are presented in Table 11 and 12.

Table 11. Details of thematic area wise assessment of technologies in Andhra Pradesh

Category	Thematic area	No. of technologies	No. of trials	No. of KVKs
Animals	Breed Evaluation	4	31	4
	Disease Management	1	5	1
	Feed and Nutrition Management	8	36	6
	Fertility Management	4	50	3
	Production and Management	5	18	5
	Total	22	140	
Crops	Cropping Systems	12	46	8
	Farm Machinery	10	66	6
	Growth Regulators	5	21	4
	Integrated Crop Management	11	73	7
	Integrated Disease Management	9	43	6
	Integrated Nutrient Management	12	53	10
	Integrated Pest Management	19	105	11
	Integrated Weed Management	2	10	2
	Resource Conservation	4	25	3
	Soil and Moisture Conservation	2	15	2
	Varietal Evaluation	43	224	18
	Total	129	681	
Women Empowerment	Entrepreneurship Development	2	15	2
	Health and Nutrition	5	58	4
	Drudgery Reduction	3	22	3
	Total	10	95	
Total		161	916	

Table 12. Details of thematic area wise assessment of technologies in Maharashtra

Category	Thematic area	No. of technologies	No. of trials	No. of KVKs
Animals	Breed Evaluation	1	10	1
	Breed Improvement	2	11	2
	Disease Management	8	224	8
	Feed and Nutrition Management	16	143	14
	Fertility Management	7	69	7
	Production and Management	4	55	4
	Total	38	512	
Crops	Cropping Systems	8	59	7
	Farm Machinery	14	118	8
	Growth Regulators	11	88	9
	Integrated Crop Management	12	90	11
	Integrated Disease Management	6	30	6
	Integrated Nutrient Management	23	197	16
	Integrated Pest Management	27	251	17
	Integrated Weed Management	7	91	7
	Resource Conservation	2	12	2
	Seed and Planting Material Production	3	28	3
	Soil and Moisture Conservation	6	59	6
	Varietal Evaluation	23	216	13
	Total	142	1239	
Women Empowerment	Entrepreneurship Development	1	10	1
	Health and Nutrition	20	342	17
	Drudgery Reduction	27	272	20
	Total	48	624	
Total		228	2375	

A total of 18 technologies were refined by KVKs in Andhra Pradesh by conducting 119 trials covering animals (36), crops (53) and women (30). Similarly, KVKs in Maharashtra organized 499 trials to refine

56 technologies covering animals (49), crops (378) and women (72). The state wise details on refinement of technologies are furnished in Table 13 and 14.

Table 13. Details of thematic area wise refinement of technologies Andhra Pradesh

Category	Thematic area	No. of technologies	No. of trials	No. of KVKs
Animals	Disease Management	1	4	1
	Feed and Nutrition Management	2	8	1
	Fertility Management	1	20	1
	Production and Management	1	4	1
	Total	5	36	
Crops	Integrated Disease Management	6	26	2
	Integrated Nutrient Management	3	14	3
	Integrated Pest Management	2	9	2
	Integrated Weed Management	1	4	1
	Total	12	53	
Women Empowerment	Health and Nutrition	1	30	1
	Total	1	30	
Total		18	119	

Table 14. Details of thematic area wise refinement of technologies in Maharashtra

Category	Thematic area	No. of technologies	No. of trials	No. of KVKs
Animals	Disease Management	1	18	1
	Feed and Nutrition Management	4	25	4
	Fertility Management	1	6	1
	Total	6	49	
Crops	Cropping Systems	1	6	1
	Farm Machinery	1	5	1
	Growth Regulators	3	36	3
	Integrated Crop Management	4	25	4
	Integrated Disease Management	1	10	1
	Integrated Nutrient Management	15	138	11
	Integrated Pest Management	13	105	8
	Integrated Weed Management	2	22	2
	Resource Conservation	2	12	1
	Seed and Planting Material Production	2	12	2

Category	Thematic area	No. of technologies	No. of trials	No. of KVKs
	Soil and Moisture Conservation	1	7	1
	Total	45	378	
Women Empowerment	Health and Nutrition	5	72	4
	Total	5	72	
Total		56	499	

Performance of technologies

Field crops

Varietal evaluation

Assessment of rice varieties

In order to replace traditional cv. BPT-5204 that is susceptible to many endemic

Technology options	No. of trials	Duration (days)	Yield (q/ha)
cv. BPT-5204 – Farmers Practice	5	145 -150	45.46
cv. JGL-11470 – Recommended Practice		135 - 140	51.71

To optimize the productivity of rice grown on irrigated plain lands of Vizianagaram, Andhra Pradesh, KVK conducted on-farm trial to assess suitability of

Technology options	No. of trials	Number of spikelets/ plant	Yield (q/ha)	BCR
Konda Dhanaym – Farmers Practice	6	13	39.33	1.80
cv. BPT-3291 – Recommended Practice		16	42.80	2.02
cv. RNR-2465 – Recommended Practice		17	47.45	2.15

Assessment of wheat

In an on-farm trial KVK Aurangabad, Maharashtra assessed wheat variety for late

Technology option	No. of trials	Yield /ha (q/ha)	Net return (Rs/ha)	BCR
cv. LOK-1 – Farmers Practice	5	27	20500	2.02
cv. NIAW-34 – Recommended Practice		33	28500	2.47

diseases of rice grown on uplands and Godavari deltas, KVK, East Godavari, Andhra Pradesh conducted five on-farm trials to identify high yielding, non lodging, fine grain variety during kharif season. Results showed that cv. JGL-11470 gave higher yields (13.7%) besides early maturity (140 days) compared to cv. BPT-5202.

various improved varieties. Cv. RNR-2465 gave higher the yield (47.45 q/ha), more spikelets (17/plant) and benefit cost ratio (2.15) compared to non-descript local variety.

sown condition of Maratwad region. Cv. NIAW-34 gave higher yield (33 q/ha), net return (Rs. 28500/ha) and BCR (2.47) compared to cv. LOK-1.

Varietal evaluation in sorghum

KVK Ahmednagar assessed the performance of the high yielding of rabi sorghum in problematic soil under rain fed

condition. Cv. Vasudha gave higher yield (7.45 q/ha), net return (Rs. 9503.70/ha) and BCR (2.04) compared to local variety cv. Maldandi.

Technology options	No. of trials	100 grain weight (g)	Yield (q/ha)	Net return (Rs./ha)	BCR
cv. Maldandi - Farmers Practice	10	2.53	4.25	1673.70	1.19
cv. Vasudha – Recommended Practice		4.25	7.45	9503.70	2.04

KVK, Beed, Maharashtra also evaluated the performance of different varieties of rabi sorghum grown on light soils. Results showed that cv. Parbhani Moti gave

significantly higher yield (15.00 q/ha), fodder yield (42.50 q/ha), net return (Rs.14675/ha) and BCR (2.31) compared to cv. M-35-1.

Technology options	No. of trials	Ear head length (cm)	1000 grain weight (g)	Fodder yield (q/ha)	Grain yield (q/ha)	Net return (Rs./ha)	BCR
cv. M 35-1 – Farmers Practice	04	18.70	47.52	36.65	14.37	12675	2.18
cv. Parbhani. Moti - Recommended Practice		23.71	50.60	42.50	15.00	14675	2.31
cv. Phule. Yashoda - Recommended Practice		20.40	45.25	32.10	10.62	7500	1.76



OFT on sorghum cv. Parbhani Moti

To identify suitable dual purpose variety of sorghum grown on medium black soils of Pune, Maharashtra, KVK assessed the performance of cv. RSV-1006. Higher grain yield (23.58 q/ha), net return (Rs. 43356/ha) and BCR (2.7) were recorded by growing cv. RSV-1006 compared to cv. M-35-1



OFT on sorghum cv. RSV-1006

Technology options	Number of trials	Yield (q/ha)	Net return (Rs./ha)	BCR
cv. M-35-1 – Farmers Practice	10	16.25	25190	1.99
cv. RSV-1006 – Recommended Practice		23.58	43356	2.7

Assessment of varieties in finger millet

In view of finger millet being staple food of tribal people in Vizianagaram, Andhra Pradesh, KVK assessed the performance cv.

Srichaitanya under both podu and plain land ecosystem. Results indicated that cv. Srichaitanya recorded higher yield and BCR in both the ecosystems.

Technology options	Number of trails	Yield (q/ha)		BCR
		Plain land	Podu land	
cv. Bharathi –Farmers Practice	5	12.82	10.40	2.74
cv. Srichaitanya - Recommended Practice		13.13	11.03	2.81

Performance of groundnut varieties

To identify a suitable variety of groundnut suitable to rainfed situation, an on-farm trial was conducted by KVK Kurnool, Andhra Pradesh. Results showed that cv. K-9

gave higher yield (14.28 q/ha) and net return (Rs. 25028/ha) besides recording more pods (14.8/plant) and higher shelling per cent (73.30) compared to traditional cv. TMV-2.

Technology options	No. of trials	No. of pods/plant	Shelling %	Net return (Rs./ha)	Yield (q/ha)	BCR
cv. TMV-2 – Farmers Practice	5	8.8	63.5	8988	8.60	1.5
cv. ICGV-91114 – Recommended Practice		9.2	66.4	11588	9.80	1.6
cv. K-9 – Recommended Practice		14.8	73.3	25028	14.28	2.4
cv. TG-37A – Recommended Practice		12.6	67.8	19628	12.48	2.1



Field visit



OFT on Groundnut cv. K-9

In similar study, cv. K-6 recorded higher yield (30.21 q/ha) and net return (Rs. 47435/ha) besides increasing pods (22/plant)

and 100 seed weight (62.80 g) under irrigated coastal ecosystem of Visakhapatnam during rabi season.

Technology options	No. of trials	No. of pods/plant	100 kernel weight (g)	Yield (q/ha)	Net return (Rs./ha)
Non-descript variety - Farmers Practice	5	14	59.2	20.64	31115
cv. K-6 – Recommended Practice		22	62.8	30.21	47435

Assessment of pigeonpea variety

In view of higher incidence wilt on pigeonpea grown rainfed alfisols of Medak, Andhra Pradesh, KVK assessed the performance of cv. PRG-158 during kharif

season. Results showed that cv. PRG-158 gave higher yield (12.06 q/ha), net return (Rs. 33.460/ha) and BCR (3.30) compared to cv. LRG-30.

Technology options	No. of trials	Yield (q/ha)	Net return (Rs./ha)	BCR
cv. LRG-30 - Farmers Practice	10	9.76	25116	2.51
cv. PRG-158 - Recommended Practice		12.06	33460	3.3

Varietal evaluation in chickpea

To combat the problem of wilt and resultant lower yields of chickpea grown in rainfed vertisols of Medak, Andhra Pradesh,

KVK assessed the performance of cv. JAKI-9218. Higher yield (10.90 q/ha), net return (Rs. 19785/ha) and BCR (3.10) were recorded with cv. JAKI-9218 compared to cv. Annegiri.

Technology options	No. of trials	Yield (q/ha)	Net return (Rs./ha)	BCR
cv. Annegiri - Farmers Practice	10	9.32	15443	2.23
cv. JAKI-9218- - Recommended Practices		10.9	19785	3.10

Introduction of soybean variety

To identify a suitable variety of soybean grown on medium soils of Pune, Maharashtra, KVK conducted an on-farm trial

during kharif season. Improved variety cv. JS-93-05 gave higher yield (26.05 q/ha), net return (Rs. 41955/ha) and BCR (2.40) compared to cv. JS-335.

Technology options	Number of trials	Yield (q/ha)	Net return (Rs./ha)	BCR
cv. JS-335 – Farmers Practice	10	23.08	25718	2.13
cv. JS-93-05 – Recommended Practice		26.05	31955	2.40

Integrated nutrient management

Soil test based fertilizer management in rice

KVK Chittoor, Andhra Pradesh assessed the performance of soil test based nutrient management in kharif rice grown on

sandy clay soils in Chittoor district. Soil test based nutrient application in kharif season as per crop specific recommendation resulted in higher tillers (16.8/hill), grains (143), yield (71.80 q/ha), net return (Rs. 54263/ha) and BCR (2.48) compared to farmers practice.

Technology options	No of trials	Tillers (number/hill)	Grains (number/panicle)	Yield (q/ha)	Net return (Rs./ha)	BCR
67.5:10:47.5 NPK kg/ha - Farmers practice	5	15.2	132	64.70	47909	2.40
Soil test based NPK: 100:57.5:40 npk+50 kg ZnSo ₄ - Recommended practice		16.8	143	71.70	54263	2.48

In a similar study by KVK Kadapa, soil test based management of nutrients gave higher yield (46.93 q/ha), more tillers

(157.5/m²), more grains (274.30/panicle) and panicle length (21.50 cm) during kharif season.

Technology options	No of trials	Tillers (number/m ²)	Grains (number/panicle)	Panicle length (cm)	Yield (q/ha)	BCR
Fertilizer application as per own assessment – Farmers Practice	4	139.00	232.50	19.60	40.75	1.59
RDF (120:80:40 NPK) – Recommended Practice		154.50	355.00	20.10	46.23	1.87
Soil test based RDF (120:80:40 NPK) – Recommended Practice		157.50	274.40	21.5	46.93	2.20

at five day interval resulted in increased tillers (467.50/m²), grains (165), yield (61.98 q/ha), net return (Rs. 35923/ha) and BCR (1.93) compared to soil application of zinc.

Management of zinc deficiency in rice

In view of 70 per cent of irrigated black soils deficient in zinc and resultant low productivity of rice, KVK Kurnool organized an on-farm trial and assessed foliar application of zinc in rice. Results showed that foliar application of 0.2 per cent chelated zinc twice

Technology options	No. of trials	No. of tillers/m ²	No. of grains/panicle	Net return (Rs./ha)	Yield (q/ha)	BCR
Zinc sulphate @ 25kg/ha – Farmers Practice	5	340.3	138	29559	56.92	1.76
Zinc sulphate @ 50kg/ha - Recommended Practice		439.2	154	34290	61.45	1.87
Foliar application of chelated zinc 0.2% - Recommended Practice		467.5	165	35923	61.98	1.93

Management of Zinc deficiency in wheat

In order to improve the nutrient use efficiency and yield of wheat grown under

cereal based production systems in calcareous soils in Ahmednagar, Maharashtra, KVK assessed and refined the nutrient management

strategies. Application of chelated zinc sulfate @ 20kg/ha with organic manure (1:10) 10 days before basal application nutrients resulted higher uptake of zinc (24.25 ppm), yield (42.94

q/ha), net return (Rs.37106.00/ha) and BCR (2.66) compared to other nutrient management practices.

Technology options	No. of trials	Zn content in leaves (ppm)	No. of tillers/plant	100 grain weight (g)	Yield (q/ha)	Net return (Rs./ha)	BCR
130:50: 50 NPK kg/ha Farmers Practice	10	18.66	08.80	04.54	37.06	29848	2.39
120: 60:60NPK kg/ha +ZnSO ₄ - 20 Kg/ha - Recommended Practice		21.21	08.80	04.72	39.31	32572	2.49
120: 60:60NPK kg/ha +ZnSO ₄ - 20 Kg/ha chelation with organic manure (1:10) - Refined Practice		24.25	09.90	05.51	42.94	37106	2.66

Foliar Application of micronutrients

KVK Ahmednagar assessed the performance of the potassium nitrate on growth and yield of chickpea under rainfed condition.

Two sprays of KNO₃ @ 0.5% at flowering and 12 or 15 days after first spray resulted in higher yield (12.05 q/ha), net return (Rs.11646.2/ha) and BCR (1.75) compared to local check.

Technology options	No. of trials	No. of pods/plant	100 grain weight (g)	Yield (q/ha)	Net return (Rs./ha)	BCR
No fertilizers – Farmers Practice	10	43.90	24.70	10.47	8741.20	1.59
Foliar spray of KNO ₃ (13:0:45 NPK) at flowering and 10 or 12 days after first spray – Recommended Practice		53.70	27.00	12.03	11646.20	1.75

Targeted yield based nutrient management

KVK, Ahmednagar assessed the performance of targeted yield based nutrient management to improve the yield of soybean in calcareous soil. Results showed that the application fertilizers on targeted yield based

equation gave higher pods (69.50/plant), 100 grain weight (13.13 g), yield (21.50 q/ha), net return (Rs. 20908.65/ha) and BCR (1.90) compared to application of fertilizers based on crop specific recommendation.

Technology options	No. of trials	No. pods/plant	100 grain wt (g)	Yield (q/ha)	Net return (Rs./ha)	BCR
50:75:20 NPK - Farmers Practice	10	61.70	12.82	18.56	15989.50	1.73
Targeted yield equation for 20 q/ha) - Recommended Practice		69.50	13.13	21.50	20908.65	1.90

Yield maximization in BT cotton

To optimize the nutrient use in BT cotton grown on rainfed black soils in Kurnool, Andra Pradesh, KVK assessed the performance of various nutrient management options.

Application NPK (150:75:100) resulted in higher number of bolls (79.4/plant), yield (24.52 q/ha), net return (Rs. 90172/ha) and BCR (3.78).

Technology options	No. of trials	No. of bolls/plant	Net return (Rs./ha)	Yield (q/ha)	BCR
NPK (240:200:38) – Farmers Practice	5	73.8	82050	23.40	3.35
NPK (120:60:60) – Recommended Practice		64.2	76180	21.53	3.42
NPK (150:75:100) – Recommended Practice		79.4	90172	24.52	3.78



Visit to BT cotton OFT field

Management of reddening in BT cotton

KVK Ahmednagar assessed the performance of refined practice of managing magnesium deficiency in BT cotton grown on rainfed black soils of Ahmednagar, Maharashtra. Soil application of magnesium sulphate @ 25 kg/ha along with recommended dose of nutrients and two or three foliar sprays of magnesium sulphate @ 0.5% increased seed cotton yield (33.0 q/ha) and net return (Rs 97596/ha) compared to application of recommended dose of nutrients

Technological options	No. of trials	Red leaves (%)	No. of bolls/plant	Boll weight (g)	Yield (q/ha)	Net return (Rs. /ha)	BCR
Application of RDF – Farmers Practice	10	20.10	68.10	6.90	25.98	73239	2.78
RDF + Foliar spray of MgSO ₄ + spray 2% urea or DAP - Recommended Practice		16.50	71.00	7.00	29.40	85101	2.92
RDF + foliar spray of Mg So ₄ + spray 2% urea or DAP + Soil application of Mg So ₄ @ 25 kg/ha) – Refined Practice		9.90	77.10	7.30	33.00	97596	3.05

In a similar study by KVK Beed, Maharashtra application of recommended dose of fertilizer along with foliar spray of (19:19:19) at peak flowering stage + 2 sprays of K NO₃ + 2% DAP during flowering to boll development resulted in higher number of bolls (165), boll weight (2.70 g), yield (18.60

q/ha) and net return of (Rs 56381/ha) compared to application of nutrients either by farmers own assessment or application of recommended dose of nutrients.

Technology options	No. of trials	Bolls (count/plant)	Boll weight (g)	Yield (q/ha)	Net return (Rs./ha)	BCR
100:40:30 NPK - Farmers Practice	06	75	2.50	10.50	26680	2.56
80:40:40 NPK/ha – Recommended Practice		120	2.60	14.60	40479	3.45
80:40:40 NPK/ha +foliar spray of 19:19:19 at Peak flowering stage to boll development stage+ 2 sprays of K NO ₃ +2% DAP during flowering to boll development.- Refined Practice		165	2.70	18.60	56381	4.20

In a another on-farm trial by KVK, Jalna, Maharashtra, application of 120:67.5:67.5 NPK along with two foliar sprays of 1 % Mg SO₄ + 1 % DAP at 60,75 and 90 DAS increased the yield (18.70 q/ha) net return (Rs.

59030/ha) and BCR (3.35) as compared to local check

Technology options	No. of trials	No. of red leaves			Yield (q/ha)	Net return (Rs. / ha)	BCR
		60 DAS	75 DAS	90 DAS			
Application of earlier RDF of 40:40:40 kg NPK/ha as a basal Dose and 40 kg N/ha as top dressing at 35 DAS - Farmers Practice	05	8.2	16.7	36.7	14.30	42350	2.92
Application of 60:67.5:67.5 kg NPK /ha as a basal dose and 60 kg N/ha as top dressing at 35 DAS along with two foliar Sprays of 1 % Mg SO ₄ + 1 % DAP at 60 and 75 DAS – Recommended Practice		0	2.3	5.8	18.70	59030	3.35

Assessment of soil test based nutrient management

To overcome the problem of imbalanced fertilization that results in excess nitrogen and low potassium, KVK East Godavari, Andhra Pradesh organized on-farm trials on soil test based nutrient management along with proper

placement irrigated lanka tobacco. Results indicated that soil test based placement of nutrients gave higher yields (28.80 q/ha) besides significant increase in net return (Rs. 95620/ha) and BC ratio (2.00) compared to imbalanced fertilizer application by broadcasting method.

Technology options	No. of trials	Yield (q/ha)	Net return (Rs./ha)	BCR	Leaf quality
Imbalanced use of fertilizers (1200: 500: 0 NPK) – Farmers Practice	5	27.80	77220	1.76	Poor
Recommended dose (300 : 50 : 50 NPK) – Recommended Practice		27.20	86455	1.98	Good
Soil test based fertilizer recommendation (300 : 50 : 50 NPK) – Recommended Practice		28.80	95620	2.00	Good

Integrated pest management

Bio Intensive Pest Management (BIPM) in rice

In an on-farm trial, KVK assessed the performance of BIPM of stem borer in rice

grown on irrigated sandy loams of Karimnagar, Andhra Pradesh. Results of three year on-farm testing of BIPM gave higher yield (52.50 q/ha) besides managing the incidence of stem borer below threshold levels.

Technology options	No of trials	% incidence of stem borer			Yield (q/ha)		
		2008-09	2009-10	2010-11	2008-09	2009-10	2010-11
Application of 3 G or 4 G Granules – Farmers Practice	6	4.52	2.62	2.90	55.00	48.75	53.20
Seed treatment with Pseudomonas @ 8g/Kg + Tricogramma release @ 1.0 lakh/ha + BT spray @ 2 Kg/ha + Pseudomonas spray @ 5 g/l – Recommended Practice		6.67	3.09	3.50	57.50	47.50	47.50

In a similar trial in Kurnool, Andhra Pradesh, BIPM significantly reduced the incidence of leaf folder (2.29%) and blast

(4.60%) besides giving higher yield (59.53 q/ha) and BCR (2.40) compared to indiscriminate spray of chemical pesticides.

Technology options	No. of trials	Leaf folder damage (%)	Blast incidence (%)	Cost of plant protection (Rs./ha)	Yield (q/ha)	BCR
Indiscriminate use of insecticides and fungicides - Farmers Practice	5	6.4	9.8	2875	56.44	2.18
BIPM by ANGRAU – Recommended Practice		2.9	4.6	1713	59.53	2.40



Biological control of rice hopper

To reduce the damage caused rice hoppers, KVK, Gadchiroli assessed the performance of *Metarhizium anisopliae*, a fungal insect pathogen. Broadcasting of *M. anisopliae* 2.5 kg/ha after withdrawing water from paddy bandhies on attaining the ETL (5-10 hoppers per hill) significantly reduced the hopper incidence (20.00 / Plant) and increased the yield (36.45 q/ha) and net return (Rs. 20345/ha).

OFT on BIPM in rice

Technology options	No. of trials	Plant hoppers (No. /plant)	Yield (q/ha)	Net return (Rs. /ha)	BCR
Spraying with Malathion 50 EC (20 ml) or Fenitrothion 50 EC (10 ml) in 10 l of water after attaining ETL (5-10 hoppers per hill) - Farmers Practice	7	38.00	31.50	14650	1.37
Broadcasting of <i>M. anisopliae</i> 2.5 kg/ha after withdrawing water from paddy bandhies on attaining the ETL (5-10 hoppers per hill) – Recommended Practice		20.00	36.45	20345	0.97

Management of chickpea pod borer

In order to minimize the damage of pod borer in chickpea grown on rainfed black soils under residual moisture in Kurnool, Andhra Pradesh, KVK conducted an on-farm trial. Spraying Novaluron @ 1ml/l increased

the yield (16.70/ha), net return (Rs. 32208/ha) and BCR (2.65) besides significant reduction in pod borer incidence (3.94 larvae/20 plants).

Technology options	No. of trials	Pod borer (larvae/20 plants)	Cost of plant protection (Rs./ha)	Net return (Rs./ha)	Yield (q/ha)	BCR
Spraying of Flubendiamide - Farmers Practice	5	5.52	2500	29979	15.84	2.57
Spraying of Thiodicarb @ 1.25 g/l – Recommended Practice		8.26	2688	28428	15.40	2.47
Spraying of Novaluron @1ml/l – Recommended Practice		3.94	2938	32208	16.70	2.65

Biological control of pigeonpea pod borer

To reduce the damage of pod borer in pigeonpea, KVK, Gadchiroli assessed the performance of *Metarhizium anisopliae*, a fungal insect pathogen. Spraying with *Metarhizium anisopliae*, conidial suspension at

50 % of flowering significantly reduced pod borer incidence (4.60/plant) and pod damage (9.57%) and gave higher yield (9.20 q/ha), net return (Rs. 20100/ha) and cost to benefit ratio (0.37) compared to spraying of conventional chemical pesticides.

Technology options	No. of trials	Pod borer incidence (larvae/plant)	Pod damage (%)	Yield (q/ha)	Net return (Rs./ha)	BCR
Spraying with endosulfan 35 EC (20 ml) in 10 l of water at 50 % of flowering (2-3 sprays)- Farmers Practice	7	7.56	29.69	7.75	15750	0.48
Spraying with <i>M. anisopliae</i> , a fungal pathogen conidial suspension at 50 % of flowering {(<i>M. anisopliae</i> 1x10 ¹⁰ conidia/ml fungal suspension 2 to 3 ml + Ranipal (0.01 %) 1 ml)} in 1 l of water – Recommended Practice		4.60	9.54	9.20	20100	0.37

Weed management**Weed management in groundnut**

To overcome the shortage of labour for weeding and inter-culture in groundnut, KVK Kadapa conducted on-farm trial using

chemical herbicides. Pre and post emergence application of pendimethalin and quizalofop ethyl gave higher net return (Rs. 3684/ha) and BCR (1.30) compared to manual weeding.

Technology options	No of trials	Pod yield (q/ha)	Net return (Rs./ha)	BCR
Manual weeding – Farmers Practice	3	4.69	401	1.10
Pre emerg. application of pendimethalin + Manual weeding at 22 DAS – Recommended Practice		4.92	3236	1.20
Pre emerg. application of pendimethalin+ post emerg. application of quizalofop ethyl – Recommended Practice		4.40	3864	1.30

Weed control by polythene mulch in tomato

In view of heavy weed incidence and resultant low productivity and poor quality of tomato in Pune, Maharashtra, KVK assessed the performance polythene mulch under well

irrigated red loams. Weed control by spreading 30 micron polythene mulch increased the productivity (891.75 q/ha), quality (73.62% A grade bulbs), net return (Rs. 466383/ha) and BCR (2.51) compared to planting without polythene mulch.

Technology options	Number of trials	Yield (q/ha)	Net return (Rs./ha)	BCR
Planting without mulch – Farmers Practice.	10	A grade 365.50 (50.83%)	218304	1.74
		B grade 240.75 (33.48%)		

Technology options	Number of trials	Yield (q/ha)	Net return (Rs./ha)	BCR
Planting with 30 micron polythene mulch – Recommended Practice		C grade 112.75 (15.68%)		
		Total – 719.00		
		A grade 655.25 (73.62%)	466383	2.51
		B grade 158.00 (17.75%)		
		C grade 78.50 (8.82%)		
		Total – 891.75		



OFT on polythene mulching in tomato

Cropping systems

Performance of field bean in intercropping with groundnut

To study the performance of field bean in intercropping with groundnut at 1:11 ratio, an on-farm trial was organized in Kadapa, Andhra Pradesh. Results showed that intercropping of field beans (cv. TFB-5) with groundnut (cv. Narayani) gave higher crop equivalent yield of base crop groundnut (12.38 q/ha) and net return (Rs. 16870/ha) compared to sole cropping of groundnut

Technology options	No of trials	Equivalent yield (q/ha)	Field bean yield (q/ha)	Groundnut yield in intercrop (q/ha)	Net return (Rs./ha)	BCR
Groundnut sole crop- Farmers practice	4	5.10	-	-	2904	1.1
Groundnut + Field bean (11:1 ratio) - Recommended practice		12.38	9.75	4.46	16870	1.74

Effect of plant population on growth and yield of soybean

To optimize the productivity of soybean grown in black soils of Beed, Maharashtra, KVK assessed the performance of optimum seed rate. Planting of soybean using seed rate of 60 kg/ha gave higher pods

(90/plant), test weight (117 g), yield (11.4 q/ha) and net return (Rs. 21367) compared to other seed rates.

Technology options	No. of trials	Pods/ plant	1000 seed weight (g)	Yield (q/ ha)	Net return (Rs./ha)	BCR
Seed rate of 70 kg/ha - Farmers Practice	5	70	980	10.30	18601	3.02
Seed rate of 75 kg/ha - Recommended Practice		60	995	9.85	16994	2.77
Seed rate of 60 kg/ha - Refined Practice		90	117	11.4	21367	3.27

Intercropping in chickpea

In order to increase the productivity of rainfed chickpea based monocropping on black soils in Kurnool, Andhra Pradesh, KVK

assessed the performance of intercropping in chickpea. Results showed that intercropping of chickpea with foxtail millet resulted in increased net return (Rs. 32948/ha) and BCR (2.20) compared to monocropping of chickpea.

Technology options	No. of trials	Yield (q/ha)		Net return (Rs./ha)	BCR
		Chickpea	Intercrop		
Chickpea - Fallow Farmers Practice	5	18.17	-	24413	2.00
Chickpea – Foxtail millet – Recommended Practice		14.92	15.64	32948	2.20
Chickpea – Greengram – Recommended Practice		16.84	2.75	25513	1.80



Chickpea – Foxtail millet



Chickpea - Greengram

Assessment of row spacing in pigeonpea

KVK Aurangabad, Andhra Pradesh assessed row spacing in medium duration pigeonpea to improve productivity under

rainfed condition. Result showed that pigeon pea planted at a row spacing 90 x 20 cm gave higher pods (375/plant) and yield (9.00 q/ha) compared to 90 x 90 cm.

Technology options	No. of trails	No. of pods/ plant	Yield (q/ha)	BCR
Row spacing (90 x 90 cm) – Farmers Practice	10	320	7.5	1.8
Row spacing (90 x 20 cm) - Recommended Practice		375	9	2.2

Assessment of planting methods in pigeonpea

In view of severe intra and inter row competition for various resources and resultant low productivity in closer planting of pigeonpea grown on medium to deep black soils under protective irrigation in Parbhani,

Maharashtra, KVK assessed the performance of various planting methods. Results showed that rectangular planting at wider spacing of 180 x 45 cm gave higher yield (11.25 q/ha), net return (Rs. 22963/ha) and BCR (2.50) besides increasing pods (172.50/plant) and 1000 grain weight (60 g) compared to drill method and square method of planting.

Technology option	No. of trials	No. of pods / plant	1000 grain weight (g)	Yield q/ha	Net return (Rs.)	BCR
Drilling at solid 90 cm row spacing – Farmers Practice	05	117.00	40.50	8.75	15808	2.13
Square method (90 x 90 cm) – Recommended Practice		130.50	46.50	10.00	18688	2.22
Rectangular method (180 x 45 cm) by dibbling - Recommended Practice		172.50	60.00	11.25	22963	2.50

Evaluation plant techniques in BT cotton

To improve the productivity of BT cotton grown on irrigated deep black soils of Parbhani, Maharashtra, KVK conducted on-farm trial on plating techniques to maintain

optimum plant stand. Planting cotton at a rectangular method (180 x 30 cm) resulted in more bolls (67/plant), boll weight (6.8 g) and yield (23.5 q/ha) compared to recommended rectangular method at 90 x 60 cm or farmers practice of square method.

Technology options	No. of trials	No. of bolls / plant	Boll weight (g)	Yield (q/ha)	Net return (Rs./ha)	BCR
Square method (105 x 105 cm) – Farmers Practice	5	47	4.20	15.00	55418	3.4
Rectangular method (90 x 60 cm) – Recommended Practice		52	5.40	20.00	79368	4.2

Technology options	No. of trials	No. of bolls / plant	Boll weight (g)	Yield (q/ha)	Net return (Rs./ha)	BCR
Rectangular method (180cm x 30 cm) – Recommended Practice		67	6.80	23.50	97493	4.9

Horticultural crops

Fruits

Management of flower and fruit drop in mango

To mitigate the problem of delayed flowering, late fruit set and premature fruit drop and resultant low yield, KVK East Godavari, Andhra Pradesh assessed the

performance of foliar application of micronutrients and hormones. Results showed that foliar application of micronutrients and growth hormones significantly reduced the fruit drop (10%) and increased the fruit set (70%), yield (209.23 q/ha), net return (Rs. 330000/ha) and BCR (2.8) compared to non application of micronutrients and hormones.

Technology options	No. of trials	Fruit setting (%)	Fruit drop (%)	Yield (q/ha)	Net return (Rs./ha)	BCR
No nutrients and hormone spray – Farmers Practice	6	40	60	122.46	111368	1.4.
Foliar sprays of Zinc $ZnSO_4$ @ 2 g/l and boron @ 1.25 g at new flush and flower bud differentiation stage + two sprays of NAA @ 2.5 ml/10 l water at flowering and at 15-20 days interval + foliar spray of KNO_3 @ 10 g/l water immediately after fruit setting – Recommended Practice		70	10	209.23	330000	2.8

Management of uneven flowering in mango

To improve the flowering and increase the fruit yield, KVK conducted on-farm trial to assess the performance of application of paclobutrazol in Ahmednagar, Maharashtra. Results showed that application of

paclobutrazol at 100 to 120 days prior to onset of flowering, recorded higher no. of panicle (9.7/branch), fruit yield (68.20 q/ha), net return (Rs. 69340/ha) and BCR (3.64) compared to soil application of K @ 0.5 kg/plant in two split doses.

Technology options	No. of trials	No. of panicles/ branch	Yield (q/ha)	Net return (Rs./ha)	BCR
Soil appl. of potassium 0.5kg/pl in 2 splits - Farmers Practice	20	8.6	58.9	59233	3.55
Paclobutrazol @ 0.062 g a.i./ plant at 100days before flowering - Recommended Practice		9.7	68.2	69340	3.64

Assessment of grafting techniques in mango

To rejuvenate old mango orchards by suitable scion wood and to improve the success per cent in Satara, Maharashtra, KVK assessed the

performance of softwood grafting technique. Results showed that softwood grafting on old mango orchards improved the success rate (90%) apart from significant reduction in expenditure on rejuvenation (Rs. 5300/ha) compared to side grafting.

Technology options	Success percentage	Expenditure (Rs./ha)
Side grafting – Farmers Practice	60	14200
Softwood grafting – Recommended Practice	90	5300



Softwood grafting in mango

Control of pre-harvest fruit drop in Nagpur Mandarin

In order to prevent pre-harvest fruit drop of nagpur mandarin during ambe bahar KVK assessed the performance of hormonal application in Yavatmal region of Maharashtra. Spraying of 2,4-D (15 ppm) + urea (150 g/10 l water) + carbendazim (1000 ppm) during

August and spraying of GA_3 (15 ppm) + KNO_3 (150 g/10 l water) + carbendazim (1000 ppm) during September significantly reduced the pre-harvest fruit drop (3.24%) and increased the fruit yield (951 fruits/plant), gross returns (Rs.125000/ha) and BCR (5.89) compared to non-adoptive practice to control pre-harvest fruit drop.

Technology options	No of trials	Fruit drop (%)	Yield (fruits/tree)	Gross returns (Rs./ha)	BCR
No specific control – Farmers Practice	13	22.61	682	65000	3.46
Spraying of 2,4-D (15 ppm) + urea (150 g/10 l water) + carbendazim (1000 ppm) during August and spraying of GA_3 (15 ppm) + KNO_3 (150 g/10 l water) + carbendazim (1000 ppm) during September – Recommended Practice		3.24	951	125000	5.89

Shoots tipping in watermelon

In view of prolonged vegetative growth after fruit setting and resultant low yield of watermelon, KVK Nandurbar, Maharashtra assessed the performance of tipping of watermelon shoots to arrest the excessive vegetative

growth. Results indicated that tipping of shoots gave higher yield (480 q/ha) and BCR (7.96) besides facilitating early maturity and harvesting (8 days) and increased the fruit weight (2.92 kg/fruit) compared conventional practice of growth without hindrance.

Technology options	No. of trials	Time to maturity after fruit set (days)	Weight of fruit (kg)	Yield (q/ha.)	BCR
Growth without any hindrance - Farmer's Practice	04	27	2.50	400	6.99
Tipping of lateral & top shoots after fruit set - Recommended Practice		19	2.92	480	7.96

Vegetables

Management of flower drop in chillies

KVK Kolhapur conducted an on-farm trial to assess the performance of improved

management practices to control flower drop in chillies grown in summer season. Spraying of 200 ppm NAA + boron (0.25%) at 50% flowering increased the yield (115.0 q/ha) and BCR (1.44) compared to either spraying or no spraying of NAA.

Technology option	No. of trials	Yield (q/ha)	BCR
No spray of any growth regulator - Farmers Practice	10	77.00	1.05
Spraying of NAA 200 ppm at the stage of 50% flowering - Recommended Practice		85.00	1.30
Spraying of 200 ppm NAA + boron 0.25% at 50% flowering stage - Refined Practice		115.00	1.44

Varietal evaluation in bhendi

In order to control Yellow Mosaic Virus (YMV) in bhendi grown under limited irrigated medium soils of Yavatmal, Maharashtra, KVK conducted an on-farm trial

to assess the performance of cv. Arka Anamika. Results showed that cv. Arka Anamika had low incidence of YMV (5.13%) besides higher productivity (81.90 q/ha), net return (Rs. 57920/ha) and BCR (3.41) compared to non-descript local variety.

Technology options	No of trials	YVMV incidence (%)	Yield (q/ha)	Net return (Rs./ha)	BCR
Non-descript variety - Farmers practice	13	10.73	48.80	23210	1.91
cv. Arka Anamika - Recommended practice		5.13	81.90	57920	3.41

Planting techniques in onion

To improve the yield of onion grown on black soils of Kadapa, Andhra Pradesh, KVK assessed the performance of ridges and furrow method of planting. Results showed

that planting onion on ridges and furrows increased the yield (103.03 q/ha), weight (68 g) and diameter (18.5 cm) of bulb and BCR (2.47) compared to flat bed planting.

Technology options	No of trials	Bulb weight (g)	Bulb diameter (cm)	Yield (q/ha)	BCR
Flat bed planting - Farmers practice	4	48	15.3	87.75	1.88
Planting on ridges and furrows- Recommended practice		68	19.5	103.03	2.47

Spices and condiments

Control of rhizome rot in ginger

KVK Beed assessed the performance of control measures for rhizome rot in ginger. Seed treatment with dimethoate + carbendizim + trichoderma @100gm in 10 l water + soil

application of neem cake @ 2 t/ha at time of planting + spraying of ridomil reduced the incidence of rhizome rot (15%) and increased yield (125 q/ha) and net return (Rs. 275000/ha) compared to rhizome treatment with carbendizim.

Technology options	No. of trials	% rot incidence	Yield (q/ha)	Net return (Rs./ha)	BCR
Rhizome treatment with carbendizim – Farmers Practice	5	50	78	149000	2.75
Rhizome treatment with dimethoate + carbendizim + trichoderma @100gm in 10 l water + soil application of neem cake@2ton/ha at time of plantation + spraying of ridomil- Recommended Practice		15	125	275000	3.75



Untreated plot



Treated plot

Improved tools and implements

Assessment of peg tooth weeder in rabi rainfed crops

In an on farm trial, KVK Aurangabad, Maharashtra assessed the performance of peg tooth weeder to reduce the drudgery of farmwomen during intercultural operation of

rabi rainfed crops. Results indicated weeding and intercultural operations by using peg tooth weeder reduced the energy expenditure (8%) and increased the area coverage (0.27 ha/individual/day) compared to conventional weeding.

Technology options	No. of trials	Heart beats/min	Energy expenditure (kj/min)	Area covered (ha/individual /day)	Muscular skeletal problems
Traditional sickls – Farmers Practice	10	110.10	8.78	0.17	Sever pains in wrist, shoulder and neck right elbow
Peg tooth weeder – Recommended Practice		105.70	8.08	0.27	Mild pain in wrist, neck and shoulder

In a similar trial on wheat and sorghum by KVK Satara, Maharashtra, weeding and interculture by peg tooth weeder increased the area covered (0.16 ha/day/individual) and

reduced the labour requirement (6.39/ha) and cost of weeding (Rs.383.47/ha) compared to traditional sickle.

Technology options	No. of trials	Area coverage (ha/day/person)	Labour requirement (number/ha)	Cost of operation (Rs./ha)
Traditional sickle – Farmers Practice	10	0.03	34.73	2083.91
Peg tooth weeder – Recommended Practice		0.16	6.39	383.47

Assessment of sugarcane bud chipper

To mitigate labour shortage and to reduce the drudgery, KVK Latur, Maharashtra assessed the performance of sugarcane bud chipper in sugarcane based cropping systems. Results showed that improved sugarcane bud chipper increased work output (223

buds/hour/individual) and reduced the labour requirement (25 man hours/5000 buds) and cost of operation (Rs. 450/5000 buds) besides considerable reduction of physical damage to buds (3%) compared to conventional bud chipper.

Technology options	No. of trials	Work output (buds/hr)	% damaged/ split buds	Labour requirement, (number/5000 buds)	Cost of operation, (Rs./5000 buds)
Conventional bud chipper – Farmers Practice	05	138	7	40	750
Improved bud chipper - Recommended Practice		223	3	25	450

Assessment of rice transplanter

To overcome the shortage of labour and increase the yield and net return, KVK Chittoor, Andhra Pradesh assessed the

performance of rice transplanter in three locations during kharif and rabi seasons. Planting of rice with transplanter gave higher number of tillers, grains, yield, net return and

BCR when compared to traditional method of transplanting. About 16% and 12% yield increase was observed in planting with transplanter during kharif and rabi respectively over traditional transplanting of rice.

Technology options	No of trials		Tillers (number/hill)		Grains (number/panicle)		Yield (q/ha)		Net return (Rs./ha)		BCR	
	K	R	K	R	K	R	K	R	K	R	K	R
Manual transplanting - Farmers Practice	3	3	15.3	12.2	109	96	6.30	5.28	24875	20302	1.81	1.65
Rice Transplanter - Recommended Practice			17.0	14.3	131	119	7.54	6.02	36375	28920	2.25	1.97

Direct seeding in rice

To mitigate the problem of labour and water shortage and resultant delay in transplanting of rice, KVK assessed the performance of aerobic rice under intensive rice-rice system in Karimnagar, Andhra Pradesh.

Dry seeding with ferti-seed drill significantly reduced the cost of cultivation (Rs. 16968/ha), seed rate (9 kg/ha) and crop duration (120 days) and increased the net return (Rs. 44130/ha) and BCR (2.60) compared to traditional transplantation.

Technology options	No. of trials	Duration (days)	Seed rate (kg/ha)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Net return (Rs./ha)	BCR
Transplantation – Farmers Practice	9	132	30	59.88	21680	40590	1.87
Dry seeding with ferti-seed drill – Recommended Practice		120	9	57.88	16968	44130	2.60

Similarly, KVK also assessed the performance of direct seeding with rice drum seeder in rice grown on intensive canal fed rice-rice system in kharif and rabi seasons. Results showed that direct seeding with drum seeder

resulted in reduced cost of cultivation, seed rate and crop duration and increased the net return and BCR compared to traditional transplantation in both kharif and rabi seasons.

Technology options	No of trials		Seed rate (kg/ha)		Duration (days)		Yield (q/ha)		Net return (Rs./ha)		BCR	
	K	R	K	R	K	R	K	R	K	R	K	R
Transplantation – Farmers Practice	14	14	30	30	130	120	62.25	62.75	42920	42185	1.96	2.82
Direct seeding with drum seeder – Recommended Practice			11	12	115	112	63.25	65.50	45515	48536	2.20	3.40

Direct seeding of rice with drum seed also resulted in higher yield (58.50 q/ha) and net return (Rs. 27375/ha) besides more number

tillers (608/sqm) in irrigated coastal system of Visakhapatnam, Andhra Pradesh.

Technology options	No. of trials	No. of tillers/sqm	Yield (q/ha)	Net return (Rs.)
Broadcasting- Farmers Practice	2	568	55.40	19305
Direct sowing with drum seeder- Recommended Practice		608	58.50	27375

In Kurnool, Andhra Pradesh direct seeding of rice with drum seeder gave higher yield (69.46 q/ha), number of hills (31.80/m²) and tillers (22.8/hill) besides significant reduction in cost of seeding (Rs. 4550/ha) compared to manual transplantation.

Technology options	No. of trials	No. of hills/sqm	No. of tillers/hill	Cost of operation (Rs./ha)	Yield (q/ha)	BCR
Manual Transplanting – Farmers Practice	5	23.4	19.6	5000-00	61.87	2.1
Direct seeding with drum seeder – Recommended Practice		31.8	22.8	450-00	69.46	2.9



OFT on rice drum seeder Refinement of CRIDA three row bullock drawn planter

In view of improper delivery of seed and fertilizer and clientele feedback received during intense assessment of three row bullock

drawn CRIDA Planter, KVK Latur in association with CRIDA, modified the planter by arranging a scrapper on ground wheel, extended seed and fertilizer delivery tube to the bottom of furrow opener and added a fertilizer agitator. The refined planter was assessed for planting of soybean, soybean + pigeon pea, chickpea and wheat crops on farmers field in Latur, Maharashtra. Results indicated that refined planter increased field coverage (2.1 ha/hr) and field efficiency (74%) and reduced the labour requirement (3.8 man hours/ha) and cost of sowing and fertilization (Rs. 214/ha) compared to conventional sowing by Tifan planter.

Technology options	No. of trials	Field capacity (ha/h)	Field efficiency (%)	Labour requirement (number/ha)	Cost of operation (Rs./ha)
Sowing by Tifan planter- Farmers Practice	12	1.45	61.3	11.0	412
CRIDA three row planter- Recommended Practice		1.85	70.0	4.3	242
Refined CRIDA three row planter- Refined Practice		2.1	74.0	3.8	214

Resource conservation

Zero tillage in maize

To combat the problem of severe shortage of labour and water and facilitate timely planting of maize under irrigated coastal ecosystem of Visakhapatnam, Andhra Pradesh, KVK assessed the performance of

zero tillage in maize. Results showed that zero tillage planting in maize resulted in higher yield (58 q/ha) and net return (Rs. 25300/ha) besides maintaining higher plant stand (15 plants/sqm) compared to sowing behind plough.

Technology options	No. of trials	No. of plants/sq m	Yield (q/ha)	Net return (Rs./ha)
Sowing behind plough-Farmers Practice	5	13	53	20550
Zero tillage planting – Recommended Practice		15	58	25300



OFT on Zero Till Maize

Moisture conservation in sunflower

In order to reduce the moisture stress in rainfed sunflower grown on black soils in Kurnool, Andhra Pradesh, KVK assessed the performance of conservation furrows. Formation of conservation furrow at 30 days after sowing along with spacing of 60 X 30 cm gave higher yield (14.87 q/ha) and net return (Rs.24459/ha) besides significant increase in test weight (5.56 g) and head diameter (15.26) compared to 30 cm solid row spacing.

Technology options	No. of trials	Head diameter (cm)	Test weight (g)	Net return (Rs./ha)	Yield (q/ha)	BCR
30 cm x solid row – Farmers Practice	5	11.87	4.63	16079	11.47	1.7
60 cm x 30 cm – Recommended Practice		14.58	5.25	22221	13.78	2.0
60 cm x 30 cm + formation of furrow at 30 DAS – Recommended Practice		15.26	5.56	24459	14.87	2.05



60 x 30 cm spacing + conservation furrow



60 X 30 cm spacing

Assessment of transplanting in pigeon pea

In view of poor germination and plant stand and resultant low productivity of rainfed pigeonpea grown under pulse based cropping systems in Latur, Maharashtra, KVK assessed

the performance of transplantation of pigeonpea seedlings. Results indicated that the transplanting of pigeon pea increased the yield (20 q/ha), net return(Rs 49750/ha) and BCR (2.64) compared to traditional practice of sowing behind plough.

Technology option	No of trials	Yield (q/ha)	Net return (Rs./ha)	BCR
Sowing behind plough – Farmers Practice	05	12.50	29000	2.38
Transplanting of pigeon pea (spacing 150 x 90 cm) Recommended Practice		20.00	49750	2.64



Pigeonpea seedlings for direct transplanting

Assessment of planting methods in cucumber

To minimize the problem of excess moisture and resultant low productivity in cucumber, an on-farm trial was conducted by KVK Visakhapatnam in irrigated coastal ecosystem. Ridge and furrow planting of cucumber gave higher yield (250 q/ha) and net return (Rs. 77500/ha) besides increasing number of fruits (20/plant), length (20 cm) and weight (187.50 g) of fruits compared to flat bed planting.

Technology options	No.of trials	Days to 50% flowering	No. of fruits/ plant	Fruit length (cm)	Fruit weight (g)	Yield (q/ha)	Net return (Rs./ha)
Flat bed method - Farmers Practice	5	45	15	18	140.10	175	47500
Ridge and furrow planting – Recommended Practice		40	20	20	187.50	250	77500



Ridges and furrow planting



Flat bed planting

Direct sowing in bhendi

To mitigate the problem of water inundation and resultant crop loss in bhendi grown on irrigated coastal system of Visakhapatnam, Andhra Pradesh, an on-farm

trial was conducted by KVK to assess the performance of direct seeding. Results showed that direct seeding of bhendi resulted in higher yield (70q/ha) and fruits (20/plant) compared to dibbling behind the plough.

Technology options	No. of trials	Days to 50% flowering	No. of fruits/plant	Yield (q/ha)
Dibbling behind plough – Farmers Practice	10	40	16	48
Direct seeding – Recommended Practice		40	20	70

Enterprises

Bio-logical control of uzi-fly

KVK assessed various methods of controlling uzi-fly infestation which account for 10-20 per cent yield losses to resource poor sericulturists in Chittoor, Andhra Pradesh. Results showed that release of *Nesolynx thymus*

along with physical and chemical methods of management significantly reduced the incidence of uzi-fly (2%) and gave higher yield (78 kg/100 DFLs) and net return (Rs. 19180/100 DFLs) compared to either physical or physical and chemical methods.

Technology options	No of trials	Incidence of uzi-fly (%)	Yield (kg/100 DFLs)	Net return (Rs./100 DFLs)	BCR
Nylon netting of doors and windows - Farmers Practice	5	10.0	50	8500	3.1
Nylon netting + anti-chamber + uzi trap near doors and windows + application of uzicide @ 5-6 ml m ² - Recommended Practice		5.0	65	14935	4.3
Nylon netting + Anti-chamber + uzi trap near doors and windows + application of uzicide @ 5-6 ml m ² + releasing two pouches of <i>Nesolynx thymus</i> /100 DFL's on 2 nd day of 5 th instar and mounting stage - Recommended Practice		2.0	78	19180	4.8

Livestock species

Fertility management in cattle

To overcome the problem of anoestrus, KVK East Godavari assessed the performance hormonal intervention to

improve the fertility in cattle under stall fed conditions. Results indicated that hormonal intervention of anoestrus in dairy cattle resulted in higher 100 per cent of heat and 60 per cent of conception compared to traditional practice of feeding minerals and vitamins.

Technology options	No. of trials	Estrous (%)	Conception (%)
Feeding minerals and vitamins – Farmers Practice	10	0	0
Administration of Receptal 5 ml on 1 st day + PGF2 Alpha 5ml on 8 th day + Receptal 5 ml on 10 th day, followed by A.I. on 11 th & 12 th day – Recommended Practice	10	100	60

Management of repeat breeding in cross-bred cows

To combat the problem of repeat breeding in cross bred milch cows, KVK Kolhapur conducted an on-farm trial by using calcium as feed mineral supplement. Feeding sugarcane tops

with 25g calcium and lime solution resulted in decreasing the repeat breeding (25%) and number of inseminations for inducing the pregnancy (2) compared to local method of feeding sugarcane tops alone.

Technology option	No. of trials	No. of inseminations	% repeat breeding
Feeding of sugarcane tops - Farmers Practice	03	03	50
Feeding sugarcane tops with 25g calcium and lime solution treatment – Recommended Practice		02	25

Prevention of clinical and subclinical mastitis in dairy cattle

KVK Ahmednagar assessed the performance of Saaf Kit for prevention of clinical and sub clinical mastitis in dairy cow.

One spray of Saaf Kit (iodine solution) after milking resulted in increased milk yield (68 l/lactation), net return (Rs.19075/lactation/animal) and BCR (1.68) besides complete control of mastitis compared to local check.

Technology options	No. of trials	Mastitis incidence (%)	Milk yield (l/lactation/animal)	Net Return (Rs. /lactation/animal)	BCR
No control – Farmers Practice	10	50	2812	18055	1.64
Saaf Kit spray after milking – Recommended Practice		0	2880	19075	1.68

In a similar trial by KVK Latur, spaying of disinfectant after milking in Maharashtra dipping teat in dip cup and crossbred cow resulted in considerable

reduction of clinical mastitis (7%), subclinical mastitis (13%) and pustules, wounds and cracks on teat (13%) and gave higher net return

(Rs. 8345/cow/year) and BCR is (1.46) compared to dipping teat in dip cup and without using disinfectant.

Technology option	No of trials	Disease incidence (%)		Pustules, cracks & wound on teat (%)	Net return (Rs./cow/year)	BCR
		Clinical mastitis	Sub clinical mastitis			
Non use of teat disinfectant - Farmers Practice	15	40	33	40	6032	1.33
Dipping of teat in dip cup - Recommended Practice		20	13	20	8345	1.40
Spaying of disinfectant by hand and dipping of teats in dip cup - Recommended Practice		07	13	13	8698	1.46

Effect of bye pass fat on fat content in crossbred cows

KVK Ahmednagar assessed the effect of bye pass fat to improve the fat content in

crossbred cow. Feeding of bye pass fat @150 g per cow/day with concentrate feed improved the fat content (3.50%) and milk yield (2754 l/lactation) compared to feeding of concentrate feed and cotton seed cake.

Technology options	No. of trials	Fat content (%)	Milk yield (l/lactation)	Net return (Rs. /lactation/ animal)	BCR
Feeding of concentrate + cotton seed cake – Farmers Practice	07	3.2	2737	21440	1.93
Feeding of concentrate feed + 150 gm by pass fat – Recommended Practice		3.5	2754	22500	1.96

Assessment of azolla as feed concentrate feed supplement in cross breed cows

In order to reduce expenditure on concentrate feed and to improve the milk yield of cross bred cows KVK Aurangabad assessed the performance of feeding 2 kg azolla with

normal feed concentrate. Azolla as feed supplement resulted in increased milk yield (0.45 l/day/cow) and net return (Rs. 9170/cow/lactation) and BCR (1.51) compared to feeding of roughages, green fodder and concentrate feed.

Technology options	No. of trials	Milk yield (l/day/cow)	Net return (Rs./cow /year)	BCR
Roughage + green fodder + feed concentrate (4 kg/day /cow) – Farmers Practice	10	6.00	5600	1.28
Roughage + green fodder + 3 kg concentrate feed + azolla 2 kg per day/cow – Recommended Practice		6.45	9170	1.51

In a similar study by KVK, Latur feeding of 2 kg azolla along with roughages and concentrates resulted higher milk fat (3.97%), milk yield (1804 l/cow/lactation) and

net return (Rs.9726/day/cow/lactation) compared to feeding of roughages and concentrates in crossbred cow.

Technology option	No of trials	Fat content (%)	Milk yield (l/cow/lactation)	Net return (Rs./cow/lactation)	BCR
Feeding of roughages +2 - 3 kg concentrates - Farmers Practice	05	3.80	1639	6587	1.31
Feeding of roughages + 2 - 3 kg concentrates + 2 kg azolla - Recommended Practice		3.97	1804	9726	1.46

Effect of feeding sunflower heads on milk production in buffalos

To combat mineral deficiency and resultant low milk yield of buffalos, KVK, Kadapa assessed the performance of grounded sunflower heads as feed substitute (source of

rich minerals) in milch buffalos. Feeding of grounded sunflower head to milch buffalos significantly increased the milk yield (752.40 l/lactation), net return (Rs. 18810/animal/year) and BCR (4.89) compared to feeding of rice bran.

Technology options	No. of trials	Milk production (l/120 days)	Net return (Rs./animal/annum)	BCR
Feeding of rice bran - Farmers Practice	5	711.8	12515	3.37
Feeding of ground sunflower heads as feed supplement – Recommended Practice		752.4	18810	4.89

Feed management in ram lambs

In an on-farm trial, KVK Kadapa assessed the performance of feeding balanced ration to improve the growth of Nellore ram

lambs. Feeding balanced ration @ of 150 g/day/animal along with grazing of tree leaves and herbs resulted in significant increase in body weight (22.55 kg/animal) compared to grazing of leaves of trees and herbs.

Technology options	No. of trials	Body weight (kg/animal)
Grazing of leaves of trees and herbs – Farmers Practice	4	18.55
Feeding balanced ration @ of 150 g/day/animal + grazing of leaves of trees and herbs – Recommended Practice		22.55

Control of endo-parasites in backyard poultry

KVK Sindhudurg, Maharashtra conducted an on farm trial to assess the method of control of endo-parasites in backyard

poultry. Feeding of papaya fruit sap resulted in significant increase in egg production (1200/20 flock), net return (Rs. 2600/20 flock) and BCR (1.65) compared to no de-worming.

Technology options	No. of trials	Eggs production/ 20 flock	Chicken production (kg/20 flock/annum)	Net return (Rs./20 flock)	BCR
No de-worming – Farmers Practice	10	1000	16	1400	1.35
Feeding 2-3 spoons of 5:1 papaya fruit sap and water for 5 days – Recommended Practice		1200	20	2600	1.65

Gender specific technologies

Improvement of nutritional status

To combat the problem of under nourishment of preschool children, KVK, Beed, Maharashtra assessed the performance

of soya poha ladu. Results showed that higher body weight (14.61 kg/child) and haemoglobin level (10.33 g/dl) were found in nourished children fed with soya poha ladu compared to those on regular diet.

Technology options	No. of trials	Body weight (kg/child)	Hb (g/dl)
Regular diet- Farmers Practice	10	9.74	8.62
Soy pahaladu- Recommended Practice		14.61	10.33

In a similar trial by KVK Latur, Maharashtra, supplementation of 100 g/day soya poha laddu resulted in better differential growth (1.11

kg/child) with considerable reduction (60%) in clinical signs and symptoms of malnutrition among pre-school children.

Technology option	No of trials	Differential weight (kg)	% reduction in clinical sign & symptoms
Regular diet - Farmers Practice	10	0.20	20
Regular diet + 100 g soya poha laddu - Recommended Practice		1.11	60

Management of anemia

In view of high incidence of miscarriage and birth of underweight babies that are attributed to poor nutrition and resultant anaemia during adolescence, KVK refined and assessed improved method of

nutrition among adolescent girls belonging to low economic status. Supplementation of normal diet + iron folic acid tablet + nutritious food i.e., laddu resulted in higher growth (49 kg) and blood hemoglobin level (13.50 g/dl) compared to control.

Technology options	No. of trials	Weight (kg)	Hb (g/dl)
Normal diet - Farmer's Practice	25	44	9.50
Normal diet + iron folic acid tablet / day - Recommended practice		46	11.00
Normal diet + iron folic acid tablet / day + diet supplementation with ground nut 30 g, jaggery 40 g, rice flakes 15 g, soya flour 15 g, Aliv 15 g, Ghee 10 g, seas mum 10 g - Refined practice		49	13.50

Fortification of iron in the diet

To combat iron deficiency in the diet of pregnant women, KVK, Gadchiroli assessed the performance of normal daily diet + poha laddoo in pregnant women. Feeding of poha

laddoo along with normal daily diet significantly increased the body weight (53.8 kg) and hemoglobin level (12.88 %) compared to recommended and normal diet.

Technology options	No. of trials	Body weight (kg/individual)	Hb (%)
Normal daily diet (Cereals-400 g, pulses-25 g, Green leafy vegetables-25 g Other vegetables -50g, fruits- 25 g, milk & its product 50 ml, fat & oil- 20 ml, sugar & jaggery- 30g)- Farmers Practice	5	42.1	11.66
Cereals 450g, pulses-55 g, green leafy vegetables-150 g, other vegetables -75 g, fruits- 30 g, milk & its product 325 ml, fat & oil- 35 ml, sugar & jaggery- 40 g)- Recommended Practice		47.4	11.98
Normal daily diet + poha laddoo- Refined Practice		53.8	12.88

Frontline Demonstrations

KVKs organize frontline demonstrations (FLDs) to demonstrate the production potential of the important varieties and various production technologies in a given farming situation. Training programmes and field days are organized for extension workers and farmers in the demonstration plots for rapid dissemination of improved technologies.

Field crops

A total of 5917 demonstrations covering 2509.59 ha under pulses, cereals, oilseeds, fibres were organized by KVKs in

Zone-V (Table 15). The major categories covered under FLDs in Andhra Pradesh include pulses (939), cereals (402) and oilseeds (353), while demonstrations on pulses (1652), oilseeds (848) and cereals (913) were covered in Maharashtra. In pulses, 959 demonstrations covering 383.82 ha were organized on pigeonpea followed by chickpea (936), greengram (429) and blackgram (217). Among oilseed crops, 486 demonstrations covering 203.60 ha were organized on soybean followed by groundnut (402), castor (93) and sesamum (78). In cotton 849 demonstrations covering 363.90 ha were organized, while in sugarcane 71 demonstrations were organized covering 28.50 ha.

Table15. Details of category wise area under FLD on field crops

Category	Crop	Andhra Pradesh		Maharashtra		Total	
		No. of Demos.	Area (ha)	No. of Demos.	Area (ha)	No. of Demos.	Area (ha)
Pulses	Pigeonpea	355	116.00	604	276.82	959	392.82
	Chickpea	244	101.50	692	339.14	936	440.64
	Greengram	225	87.10	204	82.00	429	169.10
	Blackgram	115	43.00	102	43.50	217	86.5
	Rajma	-	-	50	10.00	50	10.00
	Total	939	347.60	1652	751.46	2591	1099.06
Oilseeds	Soybean	25	12.00	461	191.60	486	203.60
	Groundnut	156	104.80	246	64.00	402	168.80

Category	Crop	Andhra Pradesh		Maharashtra		Total	
		No. of Demos.	Area (ha)	No. of Demos.	Area (ha)	No. of Demos.	Area (ha)
	Castor	93	41.00	-	-	93	41.00
	Sesamum	36	14.00	42	16.80	78	30.80
	Sunflower	41	22.70	23	7.40	64	30.1
	Niger	2	1.00	63	25.00	65	26.00
	Linseed	-	-	13	5.20	13	5.20
	Total	353	195.5.00	848	310.00	1201	505.50
Cereals	Maize	277	211.30	122	41.05	399	252.35
	Rice	125	62.40	231	61.90	356	124.30
	Wheat			158	59.20	158	59.20
	Total	402	273.70	511	162.15	913	435.85
Commercial Crops	Cotton	310	109.00	539	254.90	849	363.90
	Sugarcane	10	7.00	61	21.50	71	28.50
	Tobacco	29	6.00	-	-	29	6.00
	Total	349	122.00	600	276.40	949	398.40
Millets	Sorghum	-	-	103	36.20	103	36.20
	Fingermillet	9	2.00	23	6.00	32	8.00
	Total	9	2.00	126	42.20	135	44.20
Fodder	Napier	35	6.20	36	9.18	71	15.38
	Paragrass	-	-	20	2.00	20	2.00
	Sorghum	10	0.40	-	-	10	0.40
	Lucerne	-	-	7	0.80	7	0.80
	Total	45	6.60	63	11.98	108	18.58
Green Manures	Daincha	10	4.00	-	-	10	4.00
	Sunhemp	10	4.00	-	-	10	4.00
	Total	20	8.00	-	-	20	8.00
Total		2117	955.40	3800	1554.19	5917	2509.59

Pulses

In Andhra Pradesh, frontline demonstrations on chickpea were organized at Kurnool, Nellore, Nizamabad, Adilabad, Kadapa, Rangareddy, Krishna, Mahaboobnagar, Medak and Anantapur and improved variety cv. JG-11 along with improved management gave higher yields (18.27 q/ha) compared to local check. In Maharashtra, higher yield response (16.53%) was noticed due to improved varieties viz. Digvijay, JAKI-9218 and Vishal along with integrated nutrient and pest management practices compared to farmers practice at Ahmednagar, Amaravati, Aurangabad, Buldhana, Chandrapur, Hingoli, Jalgaon, Parbhani, Wardha, Washim, Yavatmal,

Nagpur, Thane, Osmanabad, Gadchiroli, Nandurbar, Pune, Gondia, Jalna, Kolhapur, Latur, Nashik and Solapur (Table 16).

Demonstrations on pigeonpea were organized by KVKs in Adilabad, Mahaboobnagar, Rangareddy, Khammam and Medak of Andhra Pradesh and improved varieties (cv. PRG-158 and LRG-41) and recommended package of practices gave 31.11 per cent higher yield compared to local check (Table 17). In Maharashtra, improved varieties viz. cv. Vipula, BSMR-853 and BSMR-736 along with improved management practices gave yield increase upto 23.92 per cent at Satara, Dhule, Solapur, Parbhani and Gondia (Table 16).

Table 16. Performance of Front Line Demonstrations on pulses

State	Crop	No. of demos	Area (ha)	Yield (q/ha)		Increase in yield (%)
				Demo	Check	
Andhra Pradesh	Blackgram	115	43.00	6.60	5.56	18.71
	Chickpea	244	101.50	18.27	15.60	17.12
	Greengram	225	87.10	6.21	4.83	28.57
	Pigeonpea	355	116.00	11.42	8.71	31.11
Maharashtra	Blackgram	102	43.50	9.40	6.69	40.59
	Chickpea	692	339.14	15.86	13.61	16.53
	Greengram	204	82.00	8.19	6.20	32.10
	Pigeonpea	604	276.82	19.53	15.76	23.92

In blackgram, demonstrations were conducted at East Godavari, Krishna, Nellore, Vizianagaram and Srikakulam in Andhra Pradesh with improved varieties (cv. LBG-645, 709 and 752) and nutrient management which resulted in higher yield (6.60q/ha) compared to local check (5.56 q/ha). In Maharashtra, improved varieties viz. cv. TAU-1 and AKU-15 and improved management gave higher yield (40.59%) compared to local check at Buldhana, Nanded, Osmanabad and Washim (Table 16) Frontline demonstrations on greengram were organized at Nalgonda, East Godavari, Srikakulam, Khammam, Mahaboobnagar, Medak, Visakhapatnam, Nizamabad and Warangal in Andhra Pradesh and Amaravati, Buldhana, Jalna, Parbhani and Washim in Maharashtra with improved management and high yielding varieties viz. WGG-37, LGG-460, MGG-347 (Andhra Pradesh) and TM-96-2 and AKM-8802 and AKM-9911 (Maharashtra). There was yield increase 28.57 in Andhra Pradesh and 32.10 per cent in Maharashtra compared to local check (Table 16).

Oilseeds

KVKs organized frontline

Table 17. Performance of Front Line Demonstrations on oilseeds

State	Crop	No. of demonstrations	Area (ha)	Yield (q/ha)		Increase in yield (%)
				Demo	Check	
Andhra Pradesh	Groundnut	156	104.80	19.37	16.10	20.28
	Castor	93	41.00	12.35	8.61	43.44
	Sunflower	41	22.70	17.77	15.24	16.60
	Sesamum	36	14.00	5.53	4.45	24.27

demonstrations on soybean with cv. JS-335 in Andhra Pradesh and cv. MAUS-71, DS-228, JS-9305 and JS-335 in Maharashtra along with nutrient management and plant protection measures. Results showed that improved varieties and management practices gave higher yield in Andhra Pradesh (27.28 q/ha) and Maharashtra (17.72 q/ha) compared to local check (Table 17).

Frontline demonstrations on groundnut were conducted in eleven districts of Andhra Pradesh, covering Anantapur, Chittoor, Kadapa, Kurnool, Mahaboobnagar, Khammam, Medak, Srikakulam, Vizianagaram, Visakhapatnam and Nellore and improved varieties cv. K-6 and Greeshma along with balanced fertilization and pest management gave higher yield (20.28%) compared to local check. Similarly in Maharashtra, demonstrations were organized in ten districts (Jalgaon, Sindhudurg, Thane, Sangli, Pune, Nandurbar, Satara, Gondia, Latur and Nashik). Improved varieties viz. cv. TG-37A, TG-38, TAG-24, JL-286 and JL-501 with nutrient management resulted in higher yield (12.66 q/ha) than local check (9.47 q/ha) (Table 17).

State	Crop	No. of demonstrations	Area (ha)	Yield (q/ha)		Increase in yield (%)
				Demo	Check	
	Soybean	25	12.00	27.78	20.04	38.62
	Niger	2	1.00	3.10	2.30	34.78
Maharashtra	Soybean	461	191.60	17.72	14.72	20.38
	Groundnut	246	64.00	12.66	9.47	33.69
	Niger	63	25.00	4.53	3.02	50.00
	Sesamum	42	16.80	3.18	2.28	39.47
	Sunflower	23	7.40	11.23	8.18	37.29
	Linseed	13	5.20	10.00	7.30	36.99

In sesamum, improved variety cv. Swetha in Andhra Pradesh and in Maharashtra high yielding varieties viz. AKT-64 and AKT-101 along with nutrient, pest and disease management technologies resulted 24.27 and 39.47 per cent higher yield as compared to local check. Similarly in case of sunflower, cv. ASFH-35 in Andhra Pradesh and MSHF-17 in Maharashtra with improved management practices resulted in higher yield (17.77 and 11.23 q/ha respectively) compared to local check (Table 17). Frontline demonstrations on niger organized in three tribal districts viz. Visakhapatnam (AP), Ratnagiri and Thane (MS) with improved varieties (cv. KGN-2, IGP-76 and Phule Karla) showed higher yield response to the tune of 34.78 and 50.00 per cent in Andhra Pradesh and Maharashtra respectively compared to local check. Similarly, in the frontline demonstrations on castor in Andhra Pradesh and linseed in Maharashtra in higher yield (12.35 and 10.00 q/ha in castor and linseed respectively) was noted compared to local check (Table 17).



FLD Niger - cv. Phule Karla

Cereals

Frontline demonstrations on rice were organized in ten districts of Andhra Pradesh (East Godavari, West Godavari, Krishna, Srikakulam, Nellore, Kurnool, Anantapur, Mahaboobnagar, Rangareddy and Medak) and eight districts of Maharashtra (Chandrapur, Thane, Sindhudurg, Satara, Bhandara, Gondia, Kolhapur and Raigadh). Improved varieties viz. cv. NLR-34449, BPT-5204, MTU-1010, RNR-2354 and RNR-2358 (Andhra Pradesh) and cv. Karjat-4, Phule Samrudhi, PKV-Khamang and Sye-2001 (Maharashtra) along with improved management resulted in higher yield (6.65% in Andhra Pradesh and 23.92% in Maharashtra) compared to local check (Table 18).

Similarly maize demonstrations were organized in eight districts of Andhra Pradesh (Rangareddy, West Godavari, Karimnagar, Visakhapatnam, Anantapur, Warangal, Chittoor and Srikakulam) and nine districts of Maharashtra (Nandurbar, Ahmednagar, Jalna, Dhule, Jalgaon, Nashik, Raigadh, Sindhudurg and Wardha) with improved varieties viz. cv. BH-40625, Sugar-75, and HQPM-1 with improved management such as zero tillage, soil test based nutrient management etc. Results indicated that improved varieties along with improved crop management technologies recorded higher yields (42.09 q/ha in Andhra Pradesh and 49.09 q/ha in Maharashtra) compared to local check (Table 18).

Ten KVKs in Maharashtra organized demonstrations on wheat with high yielding varieties viz. cv. Triambak, MACS-6222, AKW-3722 and JW-496 and management practices such as nutrient and weed

management. There was higher yield response (18.95%) to varieties and management practices compared to local check (Table 18).

Table 18. Performance of Front Line Demonstrations on cereals

State	Crop	No. of demonstrations	Area (ha)	Yield (q/ha)		Increase in yield (%)
				Demo	Check	
Andhra Pradesh	Maize	277	211.3	42.09	36.19	16.30
	Rice	125	62.4	58.18	54.55	6.65
Maharashtra	Maize	122	41.05	49.04	42.63	15.04
	Rice	231	61.9	35.49	28.64	23.92
	Wheat	158	59.2	31.39	26.39	18.95

Commercial crops

Frontline demonstrations on cotton were organized by 10 KVKs in Andhra Pradesh (Warangal, Karimnagar, Khammam, Krishna, Kurnool, Visakhapatnam, Nalgonda, Adilabad, Rangareddy and Nellore) and 15 KVKs in Maharashtra (Ahmednagar, Aurangabad, Dhule, Jalgaon, Jalna, Amaravati (D), Amaravati (G), Buldhana, Hingoli, Nandurbar, Washim, Yavatmal, Parbhani, Nagpur and Beed) with improved varieties (cv. Mallika, Ajit-11, NCS-207, NCS-995, Ankur, Rashi-2, BG-II etc.) and management practices (pest and nutrient management and row spacing). Results indicated that improved varieties and management technologies resulted in higher yields in Andhra Pradesh

(20.71 q/ha) and Maharashtra (19.98 q/ha) compared to non-descript varieties and local management practices (Table 19).

Similarly in sugarcane, two KVKs in Andhra Pradesh (Srikakulam and West Godavari) and three KVKs (Pune, Satara and Kolhapur) conducted frontline demonstrations focusing mainly on biological control of early shoot borer and scales and management of white grub and integrated nutrient management. There was higher yield response to biological pest control (11.41%) in Andhra Pradesh and integrated nutrient management (22.18%) in Maharashtra compared to local practice of pest control and indiscriminate use of fertilizers (Table 19).

Table 19. Performance of Front Line Demonstrations on commercial crops

Crop	State	No. of demonstrations	Area (ha)	Yield (q/ha)		Increase in yield (%)
				Demo	Check	
Cotton	Andhra Pradesh	310	109	20.71	16.8	23.27
	Maharashtra	539	254.9	19.98	17.46	14.43
Sugarcane	Andhra Pradesh	10	7	556.78	499.78	11.41
	Maharashtra	61	21.5	617	505	22.18

Millets

Frontline demonstrations on finger millet were organized by two KVKs each in Andhra Pradesh (Medak and Visakhapatnam) and Maharashtra (Thane and Raigadh) with improved varieties viz. cv. PRS-2, VR(W)-936 and Dapoli-1. Results indicated that there was higher yield with (18.47%) improved varieties viz. cv. PRS-2 and VR(W)-936 in Andhra Pradesh while in Maharashtra

cv. Dapoli-1 gave 30.48 per cent more compared to non-descript local varieties (Table20). In sorghum, six KVKs (Solapur, Ahmednagar, Pune, Satara, Nandurbar and Jalna) conducted frontline demonstrations with three improved demonstration varieties (cv. Phule Anuradha and Parbhani Moti) and integrated nutrient management and there was higher yield response (38.57%) to varieties and nutrient management (Table20).

Table 20. Performance of Front Line Demonstrations on millets

State	Crop	No. of demonstrations	Area (ha)	Yield (q/ha)		Increase in yield (%)
				Demo	Check	
Andhra Pradesh	Fingermillet	9	2.00	18.60	15.70	18.47
Maharashtra	Fingermillet	23	6.00	12.80	9.81	30.48
	Sorghum	103	36.20	17.39	12.55	38.57

Fodders

Frontline demonstrations on fodders were organized by five KVKs (East Godavari in Andhra Pradesh and Latur, Solapur, Osmanabad and Pune in Maharashtra) on hybrid Napier, fodder sorghum and Paragrass to increase the production of green fodder.

Improved varieties of hybrid Napier (cv. APBN-1, RBN-13 and Co-4) resulted in higher fodder yield (16.67 and 15.97% respectively in Andhra Pradesh and Maharashtra), while cv. Co-FS of sorghum recorded double the yield than non-descript variety (Table 21).

Table 21. Performance of Front Line Demonstrations on fodders

State	Crop	No. of demonstrations	Area (ha)	Yield (q/ha)		Increase in yield (%)
				Demo	Check	
Andhra Pradesh	Napier	35	6.20	140.00	120.0	16.67
	Sorghum	10	0.40	600.00	300.00	100.00
Maharashtra	Napier	36	9.18	257.10	221.70	15.97

Horticultural crops

A total of 1383 demonstrations covering 448.37 ha under fruits, vegetables, plantation crops and spices and condiments, were organized by KVKs in Zone-V (Table 22). The major categories covered in Andhra Pradesh include vegetables (228), fruits (168) and plantation crops (52), while vegetables

(434), fruits (397) and spices and condiments (35) were covered in Maharashtra. In vegetables, 229 demonstrations covering 58.9 ha were organized on onion followed by chillies (179), tomato (80) and bhendi (48). Among 565 demonstrations on fruits, 155 demonstrations covering 52.4 ha were organized on mango followed by pomegranate (93), banana (86) and sweet orange (71).

Table 22. Details of category wise area under FLD on horticultural crops

Category	Crop	Andhra Pradesh		Maharashtra		Zone	
		No. of demos.	Area (ha)	No. of demos.	Area (ha)	No. of demos.	Area (ha)
Fruits	Acid Lime	4	1.00	20	8.00	24	9.00
	Aonla	-	-	5	1.00	5	1.00
	Banana	14	4.40	72	26.10	86	30.50
	Custard apple	-	-	11	3.20	11	3.20
	Date Palm	-	-	10	10.00	10	10.00
	Guava	-	-	5	0	5	0
	Mango	75	26.40	80	26.00	155	52.40
	Muskmelon	-	-	5	1.00	5	1.00
	Papaya	20	12.00	-	-	20	12.00
	Pomegranate	-	-	93	27.40	93	27.40
	Sapota	-	-	20	9.00	20	9.00

Category	Crop	Andhra Pradesh		Maharashtra		Zone	
		No. of demos.	Area (ha)	No. of demos.	Area (ha)	No. of demos.	Area (ha)
	Sweet Orange	20	14.00	51	19.40	71	33.40
	Watermelon	35	6.40	25	12.00	60	18.40
	Total	168	64.20	397	143.10	565	207.30
Ornamental Crops	Chrysanthemum	4	1.00	-	-	4	1.00
	Gallardia	-	-	6	1.20	6	1.20
	Jasmine	10	4.00	-	-	10	4.00
	Marigold	-	-	6	0.12	6	0.12
	Total	14	5.00	12	1.32	26	6.32
Plantation Crops	Cashewnut	34	4.20	5	2.00	39	6.20
	Coconut	6	0.40	20	11.00	26	11.40
	Oil palm	12	3.00	-	-	12	3.00
	Total	52	7.60	25	13.00	77	20.60
Spices and Condiments	Garlic	-	-	2	0.40	2	0.40
	Turmeric	18	8.00	33	12.30	51	20.30
	Total	18	8.00	35	12.70	53	20.70
Vegetables	Bhendi	15	6.40	33	11.70	48	18.10
	Bottlegourd	-	-	5	1.00	5	1.00
	Brinjal	5	2.00	35	12.10	40	14.10
	Cabbage	5	2.00	-	-	5	2.00
	Cauliflower	5	0.40	-	-	5	0.40
	Chillies	114	33.60	65	21.00	179	54.60
	Cow pea	-	-	10	1.00	10	1.00
	Cucumber	-	-	10	2.60	10	2.60
	Dolichos bean	-	-	20	5.00	20	5.00
	Garden pea	-	-	15	6.00	15	6.00
	Onion	33	15.00	196	43.90	229	58.90
	Ridge gourd	4	0.80	-	-	4	0.80
	Tapioca	12	4.00	-	-	12	4.00
	Tomato	35	11.80	45	13.15	80	24.95
	Total	228	76.00	434	117.45	662	193.45
Total		480	160.80	903	287.57	1383	448.37

Vegetables

Four KVKs in Andhra Pradesh (Nizamabad, Kurnool, Vizianagaram and Anantapur) and 12 KVKs in Maharashtra (Amravati (G), Ahmednagar, Pune, Satara, Nandurbar, Aurangabad, Beed, Dhule, Kolhapur, Nashik, Yavatmal and Nagpur) organized frontline demonstrations on onion with improved varieties (cv. ALFR, Akola Safed, N-2-4-1, Phule Samrath and N-53) and improved management practices. There was

higher yield response to varieties and management practices both in Andhra Pradesh (15.25%) and Maharashtra (21.65%) compared to local check (Table 23). Frontline demonstrations on chillies were organized with improved varieties viz. cv. LCA-334, Parbhani Tejas, Phule Jyothi and Jayanthi and management practices. Results showed that improved varieties and management practices recorded higher yield both in Andhra Pradesh (55.40 q/ha) and Maharashtra (101.13 q/ha)

compared to local check (Table 23). Similarly, the response to improved management practices including varieties gave higher yield response in bhendi (26.10% in Andhra Pradesh and 21.24% in Maharashtra), tomato (23.20%

in Andhra Pradesh and 19.94 in Maharashtra), brinjal (15.37% in Maharashtra) and tapioca (34.00% in Andhra Pradesh) compared to local check (Table 23).

Table 23. Performance of Front Line Demonstrations on vegetables

State	Crop	No. of demonstrations	Area (ha)	Yield (q/ha)		Increase in yield (%)
				Demo	Check	
Andhra Pradesh	Chillies	114	33.60	55.40	43.24	27.41
	Tomato	35	11.80	271.97	220.75	23.20
	Onion	33	15.00	247.04	214.35	15.25
	Bhendi	15	6.40	42.32	33.56	26.10
	Tapioca	12	4.00	83.00	62.00	34.00
Maharashtra	Onion	196	43.90	204.57	168.16	21.65
	Chillies	65	21.00	101.13	84.37	19.86
	Tomato	45	13.15	65.07	54.25	19.94
	Brinjal	35	12.10	218.80	189.65	15.37
	Bhendi	33	11.70	65.64	54.14	21.24

Fruits

Frontline demonstrations on mango were conducted in seven districts of Andhra Pradesh (Krishna, Khammam, Nellore, Prakasam, Kurnool, Nizamabad and East Godavari) and in five districts of Maharashtra (Aurangabad, Beed, Latur, Sindhudurg and Nandurbar) with improved management practices. There was higher yield with

improved technology both in Andhra Pradesh (26.83%) and Maharashtra (14.59) compared to local practice (Table 24). Similar response was also noted in case of banana in Andhra Pradesh (20.40%) and Maharashtra (10.11%), sweet orange (17.86% in Andhra Pradesh and 28.61% in Maharashtra), papaya (6.75% in Andhra Pradesh) and pomegranate (17.61% in Maharashtra) (Table 24).

Table 24. Performance of Front Line Demonstrations on fruits

State	Crop	No. of demonstration	Area (ha)	Yield (q/ha)		Increase in yield (%)
				Demo	Check	
Andhra Pradesh	Mango	75	26.40	76.52	60.33	26.83
	Watermelon	35	6.40	171.55	149.08	15.07
	Papaya	20	12.00	849.58	795.83	6.75
	Sweet Orange	20	14.00	189.77	161.00	17.86
	Banana	14	4.40	437.66	273.93	20.40
Maharashtra	Pomegranate	93	27.40	154.82	131.31	17.61
	Mango	80	26.00	40.36	35.22	14.59
	Banana	72	26.10	631.85	573.82	10.11
	Sweet Orange	51	19.40	72.85	56.64	28.61
	Watermelon	25	12.00	291.50	246.5	18.25

Plantation crops

Frontline demonstrations on cashew nut were organized in three districts of Andhra

Pradesh (Vizianagaram, Srikakulam and East Godavari) and Sindhudurg, Maharashtra with improved management practices including pest

and disease control and nutrient management. Results indicated that improved management practices gave higher yield i.e 4.32 q/ha in Andhra Pradesh and 9.75 q/ha in Maharashtra.

Similarly, frontline demonstrations on coconut also showed higher yield response with improved management both in Andhra Pradesh (35%) and Maharashtra (17.16%) (Table 25).

Table 25. Performance of Front Line Demonstrations on plantation crops

State	Crop	No. of demonstrations	Area (ha)	Yield (q/ha)		Increase in yield (%)
				Demo	Check	
Andhra Pradesh	Cashew nut	34	4.20	4.32	2.77	55.95
	Coconut	6	0.40	125.55	93.00	35.00
Maharashtra	Cashew nut	5	2.00	9.75	7.60	22.05
	Coconut	20	11.00	91.04	77.7	17.16

Tools and Implements

KVKs organized 1977 demonstrations on 129 improved tools and implements with an aim to reduce the drudgery of farm women and facilitate timely field operations viz. ploughing, sowing and planting, weeding and intercultural operations and harvesting and threshing (Table

26 and 27). Out of 1977 demonstrations, 918 demonstrations were organized to improve the farm operations in case of cotton followed by rice (334), wheat (133), groundnut (116) and maize (106) and among various field operations, harvesting and threshing accounted for 681 demonstrations followed by planting and seeding (383), spraying (242), weeding and inter-culture (230) and land preparation (215).

Table 26. Performance of FLD on improved tools, implements and farm equipment

Crop	Andhra Pradesh		Maharashtra		Zone	
	NI	ND	NI	ND	NI	ND
Mango			1	2	1	2
Brinjal			1	3	1	3
Onion			1	10	1	10
Pigeonpea			1	10	1	10
Marigold	1	15			1	15
Chickpea	1	10	6	39	7	49
Banana	1	20	3	30	4	50
Sorghum	2	20	2	39	4	59
Bhendi	8	84			8	84
Soybean			12	88	12	88
Maize	1	10	5	96	6	106
Groundnut	5	31	12	85	17	116
Wheat			11	133	11	133
Rice	12	135	11	199	23	334
Cotton	6	90	26	828	32	918
Total	37	415	92	1562	129	1977

NI: Number of implements; ND: Number of demonstrations

Table 27. Details on operation wise FLD on improved tools, implements and farm equipment

Type	Andhra Pradesh		Maharashtra		Zone	
	NI	ND	NI	ND	NI	ND
Post harvest handling	4	44	5	57	9	101
Others			8	125	8	125
Land preparation	1	25	6	190	7	215
Weeding and inter-culture	4	33	19	197	23	230
Spraying	3	45	6	197	9	242
Planting and seeding	14	142	17	241	31	383
Harvesting & threshing	11	126	31	555	42	681
Total	37	415	92	1562	129	1977

NI: Number of implements; ND: Number of demonstrations

The performance of improved tools and implements under FLDs vis-à-vis the relevant indicators of performance viz. saving of labour, time required for completing the field operation, energy expenditure, field performance, output, cost of field operations etc. is presented in Table 28.

Table 28. Performance of FLD on Improved Tools, Implements and Farm Equipment

Operation	Implement	No. of demonstrations	Parameter	Result		% increase	No. of KVKs
				Demo	Control		
Land Preparation	Power Tiller	50	Coverage (ha/hr)	0.45	0.12	278.95	2
	Rotavator	165		4.15	0.83	400.00	5
Planting and Seeding	Drum Seeder	115	Yield (q/ha)	70.64	65.78	7.38	5
	Ferti-seed Drill	68	Coverage (ha/day)	1.68	0.92	82.60	2
	Planter	100		1.13	0.68	73.38	7
	Dibbler	100	% labour saving	20.00	-	-	1
Weeding and inter-culture	Power Weeder (TNAU and PAU)	74	Coverage (ha/day)	1.12	0.45	154.58	5
	Manual Weeder	47		0.11	0.05	126.78	4
	Hoes	86	Coverage (ha/day/individual)	0.16	0.05	215.38	6
	Khurpi	20		0.12	0.08	55.22	2
Spraying	Aero-blast Sprayer	152	Coverage (ha/hr)	0.74	0.24	202.86	4

Operation	Implement	No. of demonstrations	Parameter	Result		% increase	No. of KVKs
				Demo	Control		
	Taiwan Sprayer	90		0.90	0.20	355.84	5
Harvesting	Groundnut Digger	80	Coverage (ha/hr)	0.08	0.05	52.00	4
	Verticle Conveyor Reaper	27		2.20	0.50	340.00	1
	Bhendi Plucker	81	Quantity plucked (kg/hr/individual)	9.86	6.74	46.29	5
	Grain Cleaner	43	Output (kg/hr)	752.40	108.40	594.10	3
	Harvesting Bag	15	coverage (hr/ha)	12.5	8.75	42.86	1
	Harvesting Bag	50	Output (kg/day/individual)	60.00	46.00	30.43	3
	Harvesting Bag	106	Heart beat/min	107.57	115.73	-7.06	3
	Improved Sickles	225	Coverage (ha/day/individual)	0.16	0.12	34.50	11
Threshing	Groundnut Stripper	2	Output (kg/day)	531.00	170.00	212.35	1
	Maize Sheller	65		16.35	2.50	554.00	2
	Rice Thresher	15		24.00	4.00	500.00	1
Post Harvest Technology	Dal Mill	10	Output (kg/hr)	80.00	15.00	433.33	1
	Decorticator	71		67.33	37.40	80.04	6
Others	Banana Shredder	10	No. of stems/day	54.00	20.00	170.00	1
	Maize Slasher	112	Coverage (ha/hr)	0.32	0.03	1148.79	5
	Raingun	3	Coverage (m radius)	30.20	8.40	259.52	1

Operation	Implement	No. of demonstrations	Parameter	Result		% increase	No. of KVKs
				Demo	Control		
	Skirting bag	10	% increase in yield	21.7	-	-	1



FLD on Manual Double Screen Cleaner in wheat

Livestock Species

In order to demonstrate the efficacy of improved technologies, KVKs organized 1256

frontline demonstrations on various livestock species. The state and enterprise wise details of demonstrations are furnished in Table 29.

Table 29. Details of FLD on livestock and other enterprises

Enterprise	Andhra Pradesh		Maharashtra		Zone	
	NT	ND	NT	ND	NT	ND
Dairy	7	105	23	246	30	351
Fisheries	8	138	5	42	13	180
Poultry	5	311	11	328	16	639
Sheep & goat	2	26	5	60	7	86
Total	22	580	44	676	66	1256

NT : No. of technologies ND : No. of demonstrations

The performance of various improved technologies vis-à-vis the indicators with regard to livestock species is presented in Table 30. The improved technologies significantly increased the milk yield and conception rate and reduced the incidence of

mastitis and other diseases in dairy animals. In case of poultry, improved breeds Giriraja, Vanaraja and Gramapriya were evaluated for meat and egg yield, while feed management concentrate was tested for weight gain in sheep and goat.

Table 30. Performance of FLD on Livestock Enterprises

Enterprise	Thematic area	Technology	No. of demos.	Parameter	Demo	Check	No. of KV Ks
Dairy							
Buffalo	Feed and Nutrition Management	Azolla as supplementary feed	36	Milk yield (l/day/animal)	3.60	3.00	5
		Mineral blocks	20		5.00	3.68	2
		2% urea treatment of soya straw	6		6.00	5.00	1
	Fertility Management	Chelated mineral mixtures	26	% conception	66.00	33.00	2
Cow	Breed Evaluation	ND and HF	30	Milk yield (l/day/animal)	4.53	3.17	2
	Disease management	Saaf and CMT Kit	50	% reduction	70.00	-	4
	Feed and Nutrition Management	Feeding of green fodders	20	Milk yield (l/day/animal)	8.48	6.12	3
		Urea treated paddy or wheat straw	29		4.57	3.52	3
		Azolla as supplementary feed	25		4.00	3.00	1
		Area specific mineral mixtures	103		10.52	8.81	8
	Sheep and goat						
	Disease management	De-worming	61	Fecal egg count	300.00	1500	3
Sheep	Feed and Nutrition Management	Concentrate feed	10	Body weight at marketable age (kg/animal)	22.99	21.04	1
Poultry							
Chic	Breed	Giriraja	59	Eggs/hen/a	82.4	22.25	2

Enterprise	Thematic area	Technology	No. of demos.	Parameter	Demo	Check	No. of KVKs
ks	Evaluation			num	5		
		Gramapriya	13		41.00	16.45	2
		Rajashree	56	Differential weight (kg/bird)	3.50	2.80	1
		Vanaraja	62		4.40	2.20	5
	Disease management	Vaccination	425	% mortality	20.00	75.00	2
	Feed and Nutrition Management	Home made feed	10	Differential weight (kg/bird)	2.80	0.40	2
Fisheries							
Fish	Breed Evaluation	Catla & Rohu	122	Yield (q/ha)	10.88	7.06	4
		Magur	10	% survival	68.00	56.00	1
		Pangassius	13	Yield (q/ha)	10.69	4.00	2
	Production and Management	Plankton density	29	Yield (q/ha)	50.27	43.42	4
	Production and Management	Seabass culture	4	Yield (q/ha)	10.25	9.13	1



FLD on Azolla as feed supplement

Gender specific technologies

To relieve farm women of household drudgery and improve the health, nutritional status and income of women, KVKs organized 1901 front line demonstrations (Table 31). The results of demonstrations on improved cookers viz. Kisan cooker, Arti chullah and Lakshmi chullah showed significant reduction in fuel requirement by 73.00, 50.00 and 40 per cent respectively compared to traditional stoves

(Table 32). Similarly, there was higher thermal efficiency of fuel with Updraft stove (23.23) and Multifuel stove (21.57) compared to local stoves (6.67). Among technologies on health and nutrition of women and children iron and protein fortified diet resulted in increased hemoglobin in pregnant women (1.5 g/dl), while water de-fluorination significantly

reduced the fluorine content in drinking water (0.98 ppm) compared control (3.60 ppm). Improved technologies on economic empowerment of rural women viz. coir pith composting, agarbatti making, vermiculture, mushroom production and fruit preservation and sericulture gave higher returns.

Table 31. Details of FLD on livestock and other enterprises

Thematic area	Andhra Pradesh		Maharashtra		Zone	
	NT	ND	NT	ND	NT	ND
Entrepreneurship Development	9	263	4	55	13	318
Health and Nutrition	9	1317	7	135	16	1452
Improved Tools & Implements	1	2	12	211	13	213
Total	19	1582	23	401	42	1983

NT: No. of technologies; ND: No. of demonstrations

Table 32. Performance of FLD on Empowerment of Rural Women

Thematic area	Technology	No. of Demos.	Parameter	Demo	Control	No. of KVKs
Entrepreneurship Development	Coir pith compost	100	Net returns (Rs/cycle)	2805.00	1870.00	1
	Agarbatti Making	30	% increase in income	300.00	-	1
	Vermiculture	41	Compost (q/cycle)	14.48		3
	Mushrooms	5	Yield (g/bed)	500.00	350.00	1
	Fruit preservation	45	Addnl. income (Rs./month)	5000.00	-	2
	Sericulture	15	Addnl. income (Rs./cycle)	13939.00	-	1
	Sub-total	236				9
Health and Nutrition	Iron & protein fortified diet	264	Increased Hb (g/dl)	1.50	-	4
	Nutritional garden	177	% Saving of cost	48.50	-	9
	Simulation kit	996	Differential development (%)	73.30	-	2
	Water de-fluorination	110	Fl content (ppm)	0.98	3.60	1

Thematic area	Technology	No. of Demos.	Parameter	Demo	Control	No. of KVKs
	Sub-total	1562				16
House Hold Drudgery Reduction	Smokeless chullah	45	Fuel (g/kg food)	563.00	1010.25	5
	Kissan cooker	10	Fuel (g/kg food)	280.00	1065.00	1
	Laxmi chullah	20	Fuel (g/kg food)	580.00	960.00	1
	Arti Chula	10	Fuel (g/kg food)	500.00	1000.00	1
	Updraft stove (Dr.PDKV)	3	Thermal efficiency	23.23	6.67	1
	Multifuel stove (CIAE)	3	Thermal efficiency	21.57	6.67	1
	Dung collector	10	Qt. of collection (kg/hr)	19.00	10.00	1
	Sub-total	103				12
	Total	1901				

Training

Training is an important activity of KVK which play a pivotal role in enhancing the knowledge and skill about various improved technologies. KVKs assess the training needs and prioritize need based training programmes for various clientele group. The training for farmers and farm women is primarily focused on knowledge and skills, while it is entrepreneurship development and knowledge on frontier areas of science and technology in case of rural youth and extension personnel respectively.

In all, 4793 training programmes were conducted with 148310 participants including 115240 farmers, 18677 rural youth and 14393 extension functionaries (Table 33). KVKs in Andhra Pradesh organized 1755 training courses with a participation of 50408 farmers, rural youth and extension functionaries, while

the KVKs in Maharashtra conducted 3038 courses with a total participation of 97902 beneficiaries.

The main thematic areas covered under training include integrated crop management, improved tools and implements, capacity building and group dynamics, women empowerment, improved production practices for horticultural crops, productivity enhancement in livestock species, integrated pest management and soil health and fertility management.

The details of training courses vis-à-vis coverage of disciplines is given in Table 34. A total of 738 courses covering 25300 participants on crop production was conducted by KVKs followed by 604 (17139) on women empowerment, 521 (16575) on plant protection, 501 (16893) on horticultural crops, 386 (13498) on livestock production and management etc.

Table 33. Details of client wise training programmes organized by KVKs in Zone V

Clientele	Number of courses	Other beneficiaries			SC/ST beneficiaries			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Andhra Pradesh										
EF	192	2965	1519	4484	769	830	1599	3734	2349	6083
FFW	1368	21321	8117	29438	6216	4222	10438	27537	12339	39876
RY	195	1804	1543	3347	421	681	1102	2225	2224	4449
Total	1755	26090	11179	37269	7406	5733	13139	33496	16912	50408
Maharashtra										
EF	276	4917	1196	6113	1514	683	2197	6431	1879	8310
FFW	2243	38152	13408	51560	14995	8809	23804	53147	22217	75364
RY	519	6819	3300	10119	2444	1665	4109	9263	4965	14228
Total	3038	49888	17904	67792	18953	11157	30110	68841	29061	97902
Zone										
EF	468	7882	2715	10597	2283	1513	3796	10165	4228	14393
FFW	3611	59473	21525	80998	21211	13031	34242	80684	34556	115240
RY	714	8623	4843	13466	2865	2346	5211	11488	7189	18677
Total	4793	75978	29083	105061	26359	16890	43249	102337	45973	148310

EF : Extension Functionaries FFW : Farmers and Farm Women RY : Rural Youth

Table 34. State wise and discipline wise training programmes conducted for farmers

Discipline	Andhra Pradesh		Maharashtra		Total	
	NC	NB	NC	NB	NC	NB
Agricultural Engineering	11	392	149	4478	160	4870
Agro-forestry			3	149	3	149
Capacity Building and Group Dynamics	103	2804	165	5379	268	8183
Crop Production	321	10538	417	14762	738	25300
Fisheries	63	1765	43	1123	106	2888
Women empowerment	255	6799	349	10340	604	17139
Horticulture						
Fruits	72	1898	126	4844	198	6742
a. Medicinal & Aromatic plants	5	281	4	120	9	401
b. Ornamental Plants	7	185	7	203	14	388
c. Plantation crops	7	298	31	1052	38	1350
d. Spices	5	165	16	858	21	1023
e. Tuber Crops	10	527	15	305	25	832
f. Vegetable Crops	75	2080	121	4077	196	6157
Total	181	5434	320	11459	501	16893
Livestock Production and Management	109	2215	277	11283	386	13498
Plant Protection	186	5362	335	11213	521	16575
Production of Inputs at site	29	959	13	394	42	1353
Soil Health and Fertility Management	110	3608	172	4784	282	8392
Total	1368	39876	2243	75364	3611	115240

NC : Number of courses; NB : No. of beneficiaries

A total of 714 training programmes covering 18677 rural youth were conducted by KVKs in Zone-V (Table 35). The main thematic areas for training include value

addition (97) integrated farming (80), nursery management (59), tailoring and stitching (51) etc.

Table 35. Details of training programmes for rural youth.

Thematic area	Andhra Pradesh		Maharashtra		Total	
	NC	NB	NC	NB	NC	NB
Shrimp farming	-	-	1	20	1	20
Quail farming	2	40	-	-	2	40
Rabbit farming			2	44	2	44
Composite fish culture	2	29	2	40	4	69
Fish harvest and processing technology	1	32	3	73	4	105
Ornamental fisheries	2	48	3	86	5	134
Training and pruning of orchards	2	33	4	69	6	102
Bee-keeping	3	82	4	145	7	227
Commercial fruit production	2	53	7	177	9	230
Mushroom Production	5	146	8	296	13	442
Repair and maintenance of farm machinery and implements	2	45	11	267	13	312
Production of quality animal products	13	212	8	223	21	435
Post Harvest Technology	3	64	20	502	23	566
Seed Production	10	319	13	346	23	665
Protected cultivation of vegetable crops	4	112	20	429	24	541
Vermi-culture	6	214	18	508	24	722
Sheep and goat rearing	2	64	24	491	26	555
Rural Crafts	13	286	14	387	27	673
Sericulture	20	457	10	431	30	888
Production of organic inputs	6	117	25	882	31	999
Para extension workers	8	276	24	644	32	920
Small scale processing	9	230	26	733	35	963
Poultry production	4	100	33	839	37	939
Dairying	2	67	36	897	38	964
Tailoring and Stitching	34	590	7	181	41	771
Nursery Management of Horticulture crops	10	244	49	1286	59	1530
Integrated farming	16	351	64	1881	80	2232
Value addition	14	238	83	2351	97	2589
Total	195	4449	519	14228	714	18677

NC : Number of courses; NB : No. of beneficiaries

In Zone-V, 468 training courses with a participation of 14393 extension personnel covering various thematic areas viz. productivity enhancement in field crops (81), integrated pest management

(69), information networking among farmers (44), management of farm animals (35), livestock feed and fodder production (27) etc. were organized by KVKs (Table 36).

Table 36. Details of training for extension functionaries

Thematic area	Andhra Pradesh		Maharashtra		Total	
	NC	NB	NC	NB	NC	NB
Rejuvenation of old orchards	2	75	2	77	4	152
Gender mainstreaming through SHGs	3	89	3	112	6	201
WTO and IPR issues	-	-	6	162	6	162
Production and use of organic inputs	9	209	3	50	12	259
Household food security	8	591	6	194	14	785
Care and maintenance of farm machinery and implements	4	295	11	364	15	659
Formation and Management of SHGs	9	257	6	148	15	405
Capacity building for ICT application	5	128	12	234	17	362
Integrated Nutrient Management	14	444	10	294	24	738
Low cost and nutrient efficient diet designing	12	321	12	319	24	640
Group Dynamics and farmers organization	12	207	13	357	25	564
Protected cultivation technology	9	341	16	616	25	957
Women and child care	16	425	9	266	25	691
Livestock feed and fodder production	19	578	8	172	27	750
Management in farm animals	16	361	19	493	35	854
Information networking among farmers	8	143	36	847	44	990
Integrated Pest Management	19	598	50	196	69	255
Productivity enhancement in field crops	27	1021	54	164	81	266
Total	192	6083	276	831	468	14393

NC : Number of courses; NB : No. of beneficiaries

Sponsored Training

In view of better infrastructure and qualified manpower, KVKs facilitate various research institutes, line departments of state and central government, financial institutions etc. in organizing sponsored training in rural areas. KVKs organized 489 sponsored training programmes covering 24650 farmers and rural youth (Table 37). The important organizations that contributed to sponsored training include Agricultural Technology Management Agency (ATMA), National Horticultural Mission (NHM), National Bank for Agriculture and

Rural Development (NABARD), etc. The important thematic areas include productivity enhancement in field crops (6372), dairying (4469), mobilization of social capital (4186), processing and value addition (1400), other entrepreneurial activities (883), improved tools and implements (544) etc.

Vocational Training

In order to facilitate entrepreneurship development, income generation and self-employment especially among rural youth and school dropouts, KVKs organized vocational training programmes. In all, 364 vocational

training programmes covering 9284 rural youth were organized by KVKs during 2010-11 (Table 38). The important thematic areas include processing and value addition (61), other entrepreneurial activities (43), tailoring

and hand embroidery (30), nursery raising (28), poultry production (26), handling of highly skilled farm operations (26), dairying (20) etc..

Table 37. Details of sponsored training programmes

Thematic area	Andhra Pradesh		Maharashtra		Total	
	NC	NB	NC	NB	NC	NB
Ornamental fish culture	1	7	-	-	1	7
Production of bio-agents	-	-	1	50	1	50
Rural crafts	1	204	-	-	1	204
Fish and prawn production	-	-	2	63	2	63
Mushroom Production	2	27	-	-	2	27
Commercial floriculture	-	-	3	114	3	114
Feed and fodder production	3	166	-	-	3	166
Para-veterinarian	-	-	3	108	3	108
Production of organic inputs	3	114	-	-	3	114
Sheep and goat rearing	-	-	3	126	3	126
Tailoring, hand embroidery etc.	-	-	3	100	3	100
Nursery management	-	-	4	125	4	125
Making and selling of hand products	5	213	-	-	5	213
Poultry production	-	-	5	192	5	192
Women and child care	1	12	4	269	5	281
Handling of highly skilled jobs	5	315	3	64	8	379
Health and nutritional security	2	130	6	128	8	258
Production of high value crops	8	61	1	22	9	83
Management of farm animals	1	25	9	390	10	415
Post Harvest Technology	-	-	10	702	10	702
Commercial vegetable production	1	33	10	359	11	392
Commercial fruit cultivation	-	-	12	614	12	614
Integrated Nutrient Management	-	-	12	529	12	529
Para-extension workers	4	264	11	399	15	663
Integrated Pest Management	3	52	13	809	16	861
Improved tools and implements	1	44	17	500	18	544
Other entrepreneurial activities	8	274	15	619	23	893
Processing and value addition	9	401	34	999	43	1400
Mobilization of social capital	12	469	54	3717	66	4186
Dairying	-	-	74	4469	74	4469
Productivity enhancement in field crops	40	3494	70	2878	110	6372
Total	110	6305	379	18345	489	24650

NC : Number of courses; NB : No. of beneficiaries

Table 38. Details of vocational training programmes organized by KVKs

Thematic area	Andhra Pradesh		Maharashtra		Total	
	NC	NB	NC	NB	NC	NB
Commercial agriculture	-	-	1	62	1	62
Lac culture	-	-	2	77	2	77
Production of bio-fertilizers	-	-	2	66	2	66
Production of bio-pesticides	1	20	2	33	3	53
Production of bio-products			3	67	3	67
Sericulture	1	16	2	27	3	43
Agri-clinics	-	-	4	118	4	118
Commercial agriculture	3	105	1	15	4	120
Ornamental fish rearing	1	18	3	146	4	164
Para-veterinarians	-	-	4	87	4	87
Apiary	3	79	2	84	5	163
Floriculture	5	35	-	-	5	35
Mushroom production	2	50	3	113	5	163
Repair and maintenance of farm machinery	2	50	3	106	5	156
Fish and prawn production	-	-	6	136	6	136
Sheep and goat rearing	1	36	5	116	6	152
Seed production	8	99	3	76	11	175
Rural crafts	8	230	4	69	12	299
Vermiculture	7	95	6	231	13	326
Commercial horticulture	1	33	13	407	14	440
Making and selling of hand made products	16	353	2	63	18	416
Dairying	2	49	18	565	20	614
Handling highly skilled jobs	17	156	9	204	26	360
Poultry production	2	56	24	724	26	780
Nursery raising	9	173	19	409	28	582
Tailoring, hand embroidery, etc.	26	706	4	86	30	792
Other entrepreneurial activities	9	178	34	930	43	1108
Processing and value addition	7	150	54	1580	61	1730
Total	131	2687	233	6597	364	9284

NC : Number of courses; NB : No. of beneficiariess

**Vocational training on Backyard Poultry and Apiary**

Extension Activities

To create awareness among farmers about improved agricultural technologies KVKs in Zone-V organized 15893 extension activities covering 1776347 participants (Table 39). The extension activities included advisory services, exposure visits, animal health camps,

technology week, group discussions, method demonstrations, soil health camps, kisan melas, kisan ghosti, etc. KVKs in Andhra Pradesh organized 7196 extension activities covering 269364 participants and the corresponding figures for Maharashtra are 8787 and 1506983 (Table 40 and 41).

Table 39. Details of Extension Activities organized by KVKs in Zone V

Extension activity	No. of activities	Farmers			Extension functionaries			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agro-advisory	222	3895	5200	9095	339	134	473	4234	5334	9568
Animal health camps	112	45369	833	46202	600	409	1009	45969	1242	47211
Celebration of important days	138	7350	4801	12151	571	559	1130	7921	5360	13281
Diagnostic visits	1598	8510	1189	9699	1434	232	1666	9944	1421	11365
Exhibitions	156	885684	237491	1123175	68799	31523	100322	954483	269014	1223497
Exposure visits	234	6622	2320	8942	261	198	459	6883	2518	9401
Ex-trainee sammelan	22	1240	204	1444	199	72	271	1439	276	1715
Farmers field schools	5	88	2	90	2	-	2	90	2	92
Farmers foot prints	1098	90674	8172	98846	1116	353	1469	91790	8525	100315
Farmers rally	48	4382	369	4751	89	20	109	4471	389	4860
Farmers science clubs	176	6412	983	7395	378	145	523	6790	1128	7918
Field days	359	12799	2673	15472	1696	433	2129	14495	3106	17601
Film shows	393	9950	3413	13363	960	501	1461	10910	3914	14824
Group discussion	908	17462	3828	21290	1342	242	1584	18804	4070	22874
Health Camps	16	973	712	1685	-	5	5	973	717	1690
Kisan ghosthis	269	18239	16107	34346	1257	437	1694	19496	16544	36040
Kisan melas	170	42789	15116	57905	10478	6104	16582	53267	21220	74487
Lectures delivered	806	23060	4042	27102	2136	546	2682	25196	4588	29784
Mahila mandals meetings	125	457	1266	1723	16	104	120	473	1370	1843
Method demonstrations	670	11170	4050	15220	1096	499	1595	12266	4549	16815
Mobile agro-advisory	1331	43200	1803	45003	1240	326	1566	44440	2129	46569
News paper coverage	2785	-	-	-	-	-	-	-	-	-
Radio talks	406	-	-	-	-	-	-	-	-	-
Scientists field foot prints	3173	18861	3645	22506	1534	278	1812	20395	3923	24318
Self help group meetings	168	1670	1659	3329	18	495	513	1688	2154	3842
Soil health camps	174	9529	975	10504	373	59	432	9902	1034	10936
Technology week	29	24092	5960	30062	1527	414	1941	25619	6374	32003
TV programmes	148	-	-	-	-	-	-	-	-	-
Workshops, seminars, etc.	244	9788	1378	11166	2180	152	2332	11968	1530	13498
Total	15983	1304265	328191	1632466	99641	44240	143881	1403906	372431	1776347

Table 40. Details of Extension Activities organized by KVKs in Andhra Pradesh

Extension activity	No. of activities	Farmers			Extension functionaries			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agro-advisory	135	1387	5147	6534	336	134	470	1723	5281	7004
Animal health camps	60	1380	421	1801	474	328	802	1854	749	2603
Celebration of important days	63	1706	2051	3757	318	424	742	2024	2475	4499
Diagnostic visits	663	2588	427	3015	699	108	807	3287	535	3822
Exhibitions	57	37517	10108	47625	10365	3167	13532	47882	13275	61157
Exposure visits	57	1120	228	1348	41	6	47	1161	234	1395
Ex-trainee sammelan	9	249	82	331	160	60	220	409	142	551
Farmers foot prints	352	18309	3848	22157	294	90	384	18603	3938	22541
Farmers rally	46	4109	369	4478	80	20	100	4189	389	4578
Farmers science clubs	37	286	514	800	10	10	20	296	524	820
Field days	117	4799	703	5502	841	190	1031	5640	893	6533
Film shows	135	2566	1083	3649	566	301	867	3132	1384	4516
Group discussion	481	6791	1788	8579	797	180	977	7588	1968	9556
Health Camps	12	945	514	1459	0	0	0	945	514	1459
Kisan ghosthis	168	16462	15746	32208	1123	380	1503	17585	16126	33711
Kisan melas	29	19217	4317	23534	9037	2671	11708	28254	6988	35242
Lectures delivered	288	3917	1188	5105	609	176	785	4526	1364	5890
Mahila mandals meetings	80	330	420	750	5	66	71	335	486	821
Method demonstrations	349	5885	1459	7344	700	243	943	6585	1702	8287
Mobile agro-advisory	824	24537	694	25231	921	301	1222	25458	995	26453
News paper coverage	988	-	-	-	-	-	-	-	-	-
Radio talks	182	-	-	-	-	-	-	-	-	-
Scientists field foot prints	1668	7568	1418	8986	985	184	1169	8553	1602	10155
Self help group meetings	109	1294	980	2274	10	423	433	1304	1403	2707
Soil health camps	107	4142	627	4769	108	56	164	4250	683	4933
Technology week	9	5090	1164	6264	314	127	441	5404	1291	6705
TV programmes	98	-	-	-	-	-	-	-	-	-
Workshops, seminars, meetings	73	2750	490	3240	126	60	186	2876	550	3426
Total	7196	174944	55786	230740	28919	9705	38624	203863	65491	269364

Table 41. Details of Extension Activities organized by KVKs in Maharashtra

Extension activity	No. of activities	Farmers			Extension functionaries			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agro-advisory	87	2508	53	2561	3	0	3	2511	53	2564
Animal health camps	52	43989	412	44401	126	81	207	44115	493	44608
Celebration of important days	75	5644	2750	8394	253	135	388	5897	2885	8782
Diagnostic visits	935	5922	762	6684	735	124	859	6657	886	7543
Exhibitions	99	848167	227383	1075550	58434	28356	86790	906601	255739	1162340
Exposure visits	177	5502	2092	7594	220	192	412	5722	2284	8006
Ex-trainee sammelan	13	991	122	1113	39	12	51	1030	134	1164
Farmers field schools	5	88	2	90	2	0	2	90	2	92
Farmers foot prints	746	72365	4324	76689	822	263	1085	73187	4587	77774
Farmers rally	2	273	0	273	9	0	9	282	0	282
Farmers science clubs	139	6126	469	6595	368	135	503	6494	604	7098
Field days	242	8000	1970	9970	855	243	1098	8855	2213	11068
Film shows	258	7384	2330	9714	394	200	594	7778	2530	10308
Group discussion	427	10671	2040	12711	545	62	607	11216	2102	13318
Health Camps	4	28	198	226	0	5	5	28	203	231
Kisan ghosthis	101	1777	361	2138	134	57	191	1911	418	2329
Kisan melas	141	23572	10799	34371	1441	3433	4874	25013	14232	39245
Lectures delivered	518	19143	2854	21997	1527	370	1897	20670	3224	23894
Mahila mandals meetings	45	127	846	973	11	38	49	138	884	1022
Method demonstrations	321	5285	2591	7876	396	256	652	5681	2847	8528
Mobile agro-advisory	507	18663	1109	19772	319	25	344	18982	1134	20116
News paper coverage	1797	-	-	-	-	-	-	-	-	-
Radio talks	224	-	-	-	-	-	-	-	-	-
Scientists field foot prints	1505	11293	2227	13520	549	94	643	11842	2321	14163
Self help group meetings	59	376	679	1055	8	72	80	384	751	1135
Soil health camps	67	5387	348	5735	265	3	268	5652	351	6003
Technology week	20	19002	4796	23798	1213	287	1500	20215	5083	25298
TV programmes	50	-	-	-	-	-	-	-	-	-
Workshops, seminars, meetings	171	7038	888	7926	2054	92	2146	9092	980	10072
Total	8787	1129321	272405	1401726	70722	34535	105257	1200043	306940	1506983



Exposure visit of CIG - Pomegranate at Latur



Women rally on Entrepreneurship at Latur

Publications

To disseminate the information on improved agricultural technologies, KVKs of Zone-V brought out 1059 publications which

include 390 popular articles, 183 leaflets and folders, 130 technical reports and 107 CD/VCD/DVDs etc. The details of publications by the KVKs are given in Table 42.

Table 42. Details of Publications by KVKs

Type of publication	Andhra Pradesh		Maharashtra		Zone	
	Number	No of copies	Number	No of copies	Number	No of copies
Booklets	19	4017	4	4500	23	8517
Books	1	0	4	800	5	800
CD/DVD/VCDs	76	741	31	826	107	1567
Extension literature	48	38014	39	25421	87	63435
Leaflets/folders	53	49708	130	104159	183	153867
News letters	24	2602	3	84496	27	87098
Popular articles	90	0	300	0	390	0
Research papers	20	0	43	0	63	0
Technical bulletins	27	8610	17	6432	44	15042
Technical reports	57	1254	73	1605	130	2859
Total	415	104946	644	228239	1059	333185

Critical Technology Products

In order to facilitate rapid transfer of improved technologies, KVKs produce improved seed and planting material of elite species, various bio-products, improved livestock breeds and species and supplied them to farmers and farm women.

Seed and Planting Material

KVKs produced 7566.14 q of seed material (cereals 4601.81 q, oilseeds 1345.56 q, pulses 811.77q etc.) and supplied to 7091 farmers (Table 43). KVKs also produced 1414800 saplings (584851 fruits, 436995 vegetables, 121480 ornamental species, 94181 fodders etc.) and supplied to 13818 farmers (Table 44).

Table 43. Details of production and supply of seed

Category	Andhra Pradesh			Maharashtra			Zone		
	Quantity (q)	Value (Rs)	No. of farmer	Quantity (q)	Value (Rs)	No. of farmers	Quantity (q)	Value (Rs)	No. of farmers
Cereals	3129.70	5180925	2644	1472.11	1351736	784	4601.81	6532661	3428
Oilseeds	747.20	2167597	377	598.36	1550087	745	1345.56	3717684	1122
Pulses	596.15	3025966	1163	215.62	674424	582	811.77	3700390	1745
Fodders	320.57	175320	2	11.23	5570	19	331.80	180890	21
Vegetables	69.60	13030	35	47.38	391310	122	116.97	404340	157
Millets	15.56	19780	70	84.62	119143	378	100.18	138923	448
Others	-	-	-	85.04	5450	24	85.04	5450	24
Fruits	-	-	-	60.25	44648	-	60.25	44648	-
Commercial crops	56.30	9008	-	-	-	-	56.30	9008	-
Fibers	2.20	11000	26	20.25	90200	-	22.45	101200	26
Spices	-	-	-	15.50	52250	-	15.50	52250	-
Medicinal plants	10.00	300000	100	-	-	-	10.00	300000	100
Ornamental species	8.40	8400	20	0.12	-	-	8.52	8400	20
Total	4955.68	10911026	4437	2610.48	4284818	2654	7566.14	15195844	7091

Table 44. Details of production and supply of planting material

Enterprise	Andhra Pradesh			Maharashtra			Zone		
	Number	Value (Rs)	No. of farmers	Number	Value (Rs)	No. of farmer	Number	Value (Rs)	No. of farmers
Fruits	81417	1312085	2549	503434	8257055	3344	584851	9569140	5893
Vegetables	68990	26102	100	368005	211765	432	436995	237867	532
Ornamental species	8030	27690	71	113450	99145	826	121480	126835	897
Fodders	-	-	-	94181	291024	534	94181	291024	534
Forest species	17404	448419	251	65890	316927	2191	83294	765346	2442
Plantation Crops	17000	110164	355	13719	325170	135	30719	435334	490
Medicinal plants	30000	-	3000	500	7500	-	30500	7500	3000
Others	25000	25000	16	-	-	-	25000	25000	16
Commercial crops	-	-	-	7780	15560	14	7780	15560	14
Total	247841	1949460	6342	1166959	9524146	7476	1414800	11473606	13818

KVKs produced 335295.19 kg of bio-fertilizers and 49162.00 kg of bio-pesticides 3567.00 kg of bio-agents and supplied to

71700 farmers. The details of production of bio-products are given in Table 45.

Table 45. Details of production and supply of bio-products and bio-agents by

Product	Andhra Pradesh				Maharashtra				Zone			
	Number	Quantity (kg)	Value (Rs)	No. of farmers	Number	Quantity (kg)	Value (Rs)	No. of farmer	Number	Quantity (kg)	Value (Rs)	No. of farmers
Bio-fertilizers	7500	10837 3.69	1199 739	36446	2316 2	22692. 50	3047 054	20974	306 62	33529 5.19	424 679 3	5742 0
Bio-pesticides	5000	8002.4 0	7039 50	629	1837 3	41159. 60	3792 751	13138	233 73	49162. 00	449 670 1	1376 7
Bio-agents					1093	3567.0 0	6553 5	224	109 3	3567.0 0	655 35	224
Bio-foods	-	-			387	147.85	7857 2	289	387	147.85	785 72	289
Total	12500	11637 6.09	1903 689	37075	4301 5	27179 5.95	6983 912	34625	555 15	38817 2.04	888 760 1	7170 0

Livestock Species

KVKs produced 216200 fingerlings,

65733 poultry species, 652 sheep and goat etc. of elite species and supplied to 6275 farmers (Table 46).

Table 46. Details of production and supply of livestock, sheep and goat and poultry breeds and fish fingerlings

Product	Andhra Pradesh			Maharashtra			Zone		
	Number	Value (Rs)	No. of farmers	Number	Value (Rs)	No. of farmers	Number	Value (Rs)	No. of farmers
Dairy	15	23700	3	44	547430	-	59	571130	3
Fishery	81200	193464	802	135000	89860	85	216200	283324	887
Poultry	10901	468371	2325	54832	2152395	2839	65733	2620766	5164
Sheep & goat	54	156875	15	598	915657	206	652	1072532	221
Total	92170	842410	3145	190474	3705342	3130	282644	4547752	6275

Soil and water testing

KVKs undertake soil and water testing primarily to ascertain the nutrient status of fields earmarked for technology assessment and refinement so as to make soil test based nutrient recommendations in various micro-

farming situations in the district. A total number of 72167 samples including soil (42695), water (19290), plant (835), fertilizer/manure samples (513) etc. were analyzed by the KVKs benefitting 50299 farmers of 8746 villages (Table 47).

Table 47. Details of soil and water testing by KVKs of Zone-V

Type of sample	Andhra Pradesh				Maharashtra				Zone			
	NS	NB	NV	Amount (Rs.)	NS	NB	NV	Amount (Rs.)	NS	NB	NV	Amount (Rs.)
Fertilizer/ manure samples	-	-	-	-	513	298	96	4800	513	298	96	4800
Leaf/ petiole samples	-	-	-	-	25	25	20	8125	25	25	20	8125
Plant samples	151	151	11	38400	684	238	49	37380	835	389	60	75780
Soil samples	8557	7425	606	552890	34138	32496	5148	2547189	42695	39921	5754	3100079
Water samples	463	453	207	16900	9827	9213	1690	326563	10290	9666	1897	343463
Total	9171	8029	824	608190	45187	42270	7003	2924057	72167	50299	7827	3532247

Rainwater Harvesting

During the year 2007, ICAR provided rain water harvesting and micro-irrigation system to facilitate rapid dissemination of the knowhow among farmers through demonstration and training. The details of

training programmes on rain water harvesting conducted by KVKs are given in Table 48. A total of 109 courses were conducted for 1839 farmers and farmwomen and extension personnel.

Table 48. Details of training programmes conducted by KVK in rain water harvesting

State	District	No. of courses	No. of beneficiaries		
			Male	Female	Total
Andhra Pradesh	Ranga Reddy	9	343	64	407
	Total	9	343	64	407
Maharashtra	Amaravati-D	10	114	162	276
	Bhandara	3	111	39	144
	Buldhana	2	115	0	115
	Chandrapur	64	146	0	146
	Hingoli	2	61	5	66
	Jalna	5	165	48	213
	Nandurbar	2	200	0	200
	Thane	12	204	68	272
	Total	100	1116	322	1432
Total		109	1459	386	1839

TECHNOLOGICAL BACKSTOPPING

The Directorates of Extension of State Agricultural Universities and Zonal Project Directorates facilitate technological backstopping and Human Resource Development (HRD) to the KVKs through training and capacity building, seminars, workshop etc. There are five Directorates at Zone-V under Acharya N. G. Ranga Agricultural University and Dr. Balasaheb

Sawant Konkan Krishi Vidyapeeth, Mahatma Phule Krishi Vidyapeeth, Marathwada Agricultural University and Dr. Punjabrao Deshmukh Krishi Vidyapeeth in Maharashtra. A total of 29 HRD activities benefitting 1223 KVK staff in Zone-V were jointly organized by the directorates of extension and the Zonal Project Directorate (Zone-V). The details of HRD activities are furnished in Table 49.

Table 49. Details of training programmes and meetings conducted by ZPD and SAUs of Andhra Pradesh and Maharashtra

Organization	Workshop/meeting/training	No. of programmes	No. of participants	No. of KVKs
ANGRAU, Hyderabad	Action Plan workshop of KVKs of AP	1	150	22
	Communication skill for effective training	1	20	20
	Communication Skills of Programme Coordinators of AP	1	20	20
	Process documentation & impact evaluation methodology	1	20	20
	Focused adoption of cluster villages through KVKs	1	44	21
	Orientation training programme for newly recruited KVK staff	1	34	7
	Total	6	288	110
Dr. BSKKV, Dapoli	Advance technology for cultivation of Pulses and oil seed crops	1	4	3
	Promotion of IPM for vegetables, spices and fruit crops.	1	7	4
	Cultivation and processing of medicinal and aromatic plants	1	4	3
	Review Meeting	1	60	4
	Total	4	75	14
MAU, Parbhani MPKV, Rahuri	Action plan workshop	1	65	8
	Technology demonstration for harnessing pulse productivity	1	25	8
	HRD training on Hi-	1	25	8

Organization	Workshop/meeting/training	No. of programmes	No. of participants	No. of KVKs
	Tech horticulture			
	Nursery management of Horticultural crops	1	20	20
	Precision farming in Horticulture	1	13	13
	Recent advances in nutritional management of dairy animals	1	20	20
	Production technology of biofertilizers and biopesticides	1	17	17
	Action Plan Workshop	1	110	14
	QRT Meet	1	60	33
	Total	9	355	141
Dr. PDKV, Akola	Action Plan Workshop	1	120	11
	Brainstorming	1	179	4
	Commodity Futures Market for Agricultural Universities	1	39	11
	Training Programme on Soil Testing & Fertilizer Use	1	14	11
	HRD Training on Process Documentation for KVK Scientists	1	19	11
	Total	5	371	48
ZPD (Zone-V), Hydereabad	FLD C action plan meeting	1	21	21
	Orientation training	1	-	10
	Training of extension officers TDOP MS	1	25	10
	Annual Zone Workshop	1	70	55
	Action Plan Workshop of NICRA	1	18	7
	Total	5	134	103
Grand Total		29	1223	

AGRICULTURAL TECHNOLOGY INFORMATION CENTRE

In view of greater need for direct access of farmers to institutional resources, ICAR established 44 Agricultural Technology Information Centres (ATIC) at some of the renowned institutions of National Agricultural Research System during 1997-98. In Zone-V, six ATIC were established, one each at five State Agricultural Universities viz. Acharya N. G. Ranga Agricultural University, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Mahatma Phule Krishi Vidyapeeth, Marathwada Agricultural University and Dr. Punjabrao Deshmukh Krishi Vidyapeeth in Maharashtra and one at ICAR research institute i.e Central Research Institute for Cotton Research, Nagpur, Maharashtra.

During the year, a total of 30054 farmers visited the six ATICs to access the latest technological information and critical technology products viz. seed and planting material. ATICs published latest technical information in the form of books, bulletins and electronic print format viz. compact disks and digital virtual discs for the benefit of farmers. The details on number of publications by ATICs are furnished in Table 50. A total of 51187 copies of various publications of 112 publications were sold by ATICs which benefitted 49958 farmers with a revenue of Rs. 5774595/- .

Table 50. Details of publication by ATICs

Particulars	Number of publications	No. of copies	Revenue (Rs.)	Number of farmers
Books	9	10660	3036135	8931
Calenders	1	100	2000	100
CDs/DVDs	18	1300	40680	3100
Diaries	1	1026	82080	1026
Leaf lets/folders	48	4817	0	1367
News letters	1	3000	3000	3000
Technical bulletins	34	30284	2610700	32434
Total	112	51187	5774595	49958

Similarly, various critical technology products such as seed and planting material of improved varieties of crops, elite breeds of livestock, improved farm implements etc. were sold by ATICs which generated a revenue of Rs. 11186920/- and benefitted 31224 farmers

and farmwomen (Table 51). ATICs in Zone-V also facilitated other technology advisory and services viz. soil and water testing, plant diagnostics, exhibitions and radio and television programmes which benefitted 30054 farmers (Table 52).

Table 51. Details of technology products produced and supplied by ATICs

Particulars	Quantity	Revenue (Rs.)	Number of farmers
Bio-fertilizers	83.33	531176	6003
Bi-products	0.5	50000	250
Processed products	6721.48	398986	4184
Seed	1681.92	8489445	17133
Planting material	109798	695561	1608
Implements	4757	937614	1942
Livestock species	43	84138	9
Soil testing	100	-	95

Table 52. Details of technology services provided by ATICs

Particulars	Number of farmers
Agro-advisory	4266
Diagnostic services	24848
Sale of products	940
Total	30054

STAFF POSITION IN ZONAL PROJECT DIRECTORATE

S. No.	Name	Designation
1.	Dr. N. Sudhakar	Zonal Project Director
2.	Dr. K. Dattatri	Principal Scientist
3.	Dr. K. Mahadeva Reddy	Senior Scientist
4.	Dr. G. Rajender Reddy	Field Officer
5.	Shri B. Amaranath	Asst. Adm. Officer
6.	Shri. S. Bala Kamesh	Asst. Fin. & Acct. Officer
7.	Smt. S. Hemalatha	Personal Assistant
8.	Shri. V.V. Ramana	Assistant
9.	Ms. N. Archana	Lower Division Clerk
10.	Smt. G. Navaneetha	Lower Division Clerk
11.	Shri. N. Vijay Kumar	Lower Division Clerk
12.	Shri. M. Sadanand	Driver
13.	Smt. Subbalakshmi	SSS



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