Padma Vibhushan Acharya N.G.Ranga

Indian freedom fighter, Parliamentarian, and Kisan leader

Inspiration, Guiding spirit behind the establishment of RASS – Acharya Ranga Krishi Vigyan Kendra

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FOREWORD

My Hearty Congratulations and greetings to KVK, Tirupati and its Staff for completing 20 years of their dedicated service in the nation building through strengthening agriculture with appropriate technologies innovation and farmers empowerment in the district.

Innovation is an essential plank to build the edifice of success. It is proud to note that millions of farm families in the district have been benefitted with the focused, sustained and innovative approaches of the KVK and its host organisation Rashtriya Seva Samiti. The KVK's work on farm mechanisation, resource conservation, women empowerment, livestock and poultry development, income generation activities and horticultural promotion in the district bringing in food, nutritional and livelihood security deserves whole hearted appreciation.

The equity, efficiency and sustainability aspect of the approaches followed by the KVK led to an inclusive growth in the district. It takes several ingredients to convert even the best of ideas into resounding success. The staff of the KVKs, the support of its host organisation and ICAR, technological and methodological back stopping from the R&D system in the country and receptive farmers of the district put together contributed to a resounding success of the KVK, Tirupati in its two decades of service. KVK, Tirupati has gone much beyond what is normally expected out of a KVK and the dedicated team work behind the success deserves rich appreciation.

It is a pleasure for me to associate myself with the activities of KVK, Tirupati and consider it as a honour to write the foreword for the souvenir brought out in celebration of their two decades of service to the farmers and agricultural development in the district. I wish all success to KVK, Tirupati and its team.

Dr.G.Muniratnam .6.2011

(V. Venkatasubramanian)
Assistant Director General (AE)

Preface

Acharya Ranga Krishi Vigyan Kendra (ARKVK) sponsored by Indian Council of Agricultural Research, New Delhi has joined the family of Rashtriya Seva Samithi during 1992 and it gives me immense pleasure for convey greetings to this institute for succesfully serving on twentieth year. With the guiding spirit of Acharya N.G.Ranga, Veteran Parlimentarian and Kisan Leader, ARKVK was established for serving the farming community in Chittoor district. ARKVK has always been in forefront in solving the problems of small and marginal farmers, farm women and rural youth by transferring need based technologies thereby enhancing their socio-economic status.

Through seed village concept, ARKVK developed few potential villages which can multiply and produce quality groundnut seed of latest high yielding varieties which fills the gap of technology generated and technology adopted. In view of poor resources available in drought prone Chittoor district, ARKVK has succesfully introduced resource efficient rice production technologies like System of Rice Intensificaion, Direct seeding in rice etc which are popularly adopted by the farmers. Agricultural labour lacking both in adequacy and skill needs to be replaced by mechanization for continuing Agriculture and ARKVK has focussed on these aspects by introducing Ferti-cum- Seed drills in Groundnut, Digger for harvesting Groundut, Paddy transplanters, Brush cutter, modified conoweeders in Paddy, etc and they are widely adopted by the farmers. Latest technologies are also disseminated to Horticulture and Sericulture farmers in the district to improve the productivity.

Quality seed and planting material of Paddy, Groundnut, Redgram, Mango, Sweet Orange, Drumstick and Medicinal plants are produced at KVK farm and supplied to farmers.

I am very much thankful to Indian Council of Agricultural Research and Zonal Project Directorate of Zone V for extending their support, technically and financially for successful running of ARKVK. I sincerely thank ANGRAU, NABARD, NMPB, DGR, CAPART, NHM, ATMA and other organizations, Philanthropists, farmers supporting the functioning of KVK.

I congratulate all the staff of ARKVK for serving the farmers for the past 20 years and hope they will continue with more commitment. I wish them all the best.

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1. Introduction

Indian Agriculture has registered phenomenal growth during the last four decades with manifold increase in production of major commodities like food grains, vegetables, fruits, milk, eggs and fish. As a result, the per capita availability of important food items has increased despite of increasing population. The ratio of agricultural land to population engaged in agriculture has shrunk to 0.3 ha per person in India as compared to 11.0 ha per person in developed countries. The resources are getting marginalized and there is tremendous pressure on natural resources with divergence of agricultural land and water towards industrial, urban and non-agricultural sector. Contrary to the decline in these resources there is increasing population pressure. India's population during the last three and half decades has increased from 551 million to 1122 million which implied that the country had to feed double the population. Therefore, food security continues to be one of the major concerns and thus, agriculture sector is efficient application of agricultural technologies while empowering farmers by developing entrepreneurial skills. This requires agricultural research for development with dynamic technology backstopping and advisory to support demand driven extension system in the country.

Realizing this, the Indian Council of Agricultural Research (ICAR) has taken up number of front line extension programmes over the years to respond to emerging challenges, most importantly food security, sustainability and livelihood security and Krishi Vigyan Kendra (KVK) is one such specialized effort of ICAR with a perspective vision for sustainable development of the respective district. KVK's function as knowledge and resource centre to address the emerging challenges while effectively providing technological backstopping and advisory to the main extension system as well as farmers. KVK's focus their efforts for assessment and refinement of various techniques and technologies for productivity enhancement and empowerment of the farming community. With the first KVK established in 1974, the journey of KVK's have been remarkable enabling its existence in 589 districts and it is envisaged that by the end of XI plan the number of KVK's in the country would be around 667.

2. About the District

2.1 Location

Chittoor district is situated between 12^0 – 37" to 14^0-8" North Latitude and 78^0-33" to 79^0-55" East Longitude.

2.2 Population

The population of the district is 37.45 lakhs with a density of 246 per Sq.km. There are 5.28 lakh cultivators and 6.29 lakh agricultural labourers in the district as per 2001 census.

Table – 1: Socio-economic and technological profile of the District

Total no. of mandals in the district:	66
Total no. of revenue villages in each mandal :	1580
Total population of the district :	37,45,875
Literacy rate	66.80
Rural population in the district	29,34,845
Rural population as % to Total Population	78.30
Marginal farmers (< 2.47 acres)	2,78,443
Small farmers (2.47 – 4.93 acres)	1,11,676
Other farmers (4.94 acres & above)	86,738
Geographical area of the district (ha)	14,98,778

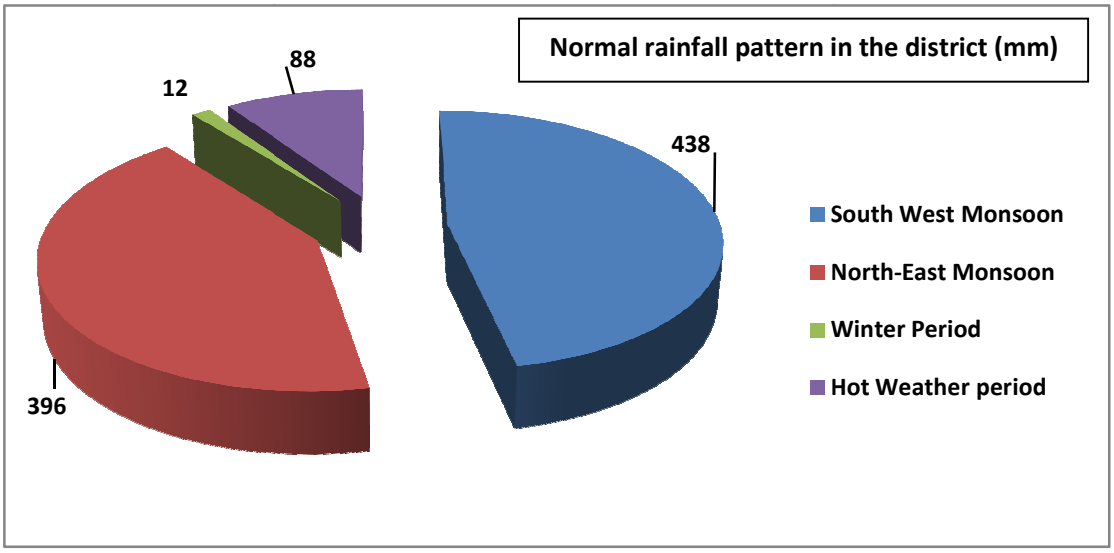
2.3 Agro-Climatic Zone

The district is categorized under Southern Agro climatic zone of Andhra Pradesh based on soil type, rainfall and altitude. Groundnut cropping system occupies maximum area of the zone followed by Rice. In dry farming tract of the zone, mono cropping of the Groundnut is the main stay whereas under canals, tanks, wells and bore wells, double cropping is practiced.

2.4 Rainfall

The District has the benefit of receiving rainfall during both the South West and North East Monsoon periods. While the normal rainfall of the District for the South West Monsoon period is 438.00 mm that for North East Monsoon period is 396.00 mm. The rainfall received during the Winter Period and hot weather period is negligible their respective normals being 12.0 mm and 88.0 mm. The Annual normal rainfall of the District is 934.0 mm.

The rainfall received from the South West Monsoon is more copious compared to North East Monsoon in the Western Mandals and in the Central part of the District, where as the rainfall received from North East Monsoon is comparatively copious in the eastern Mandals of the District.



2.5 Temperature

Maximum temperature in the western parts of the district is around 36^0 to 38^0 C and in the eastern parts it touches 46^0C.

Minimum temperature in the western parts us around 12^0 to 14^0 C and in eastern parts it is 16^0 to 18^0 C.

2.6 Land Utilization

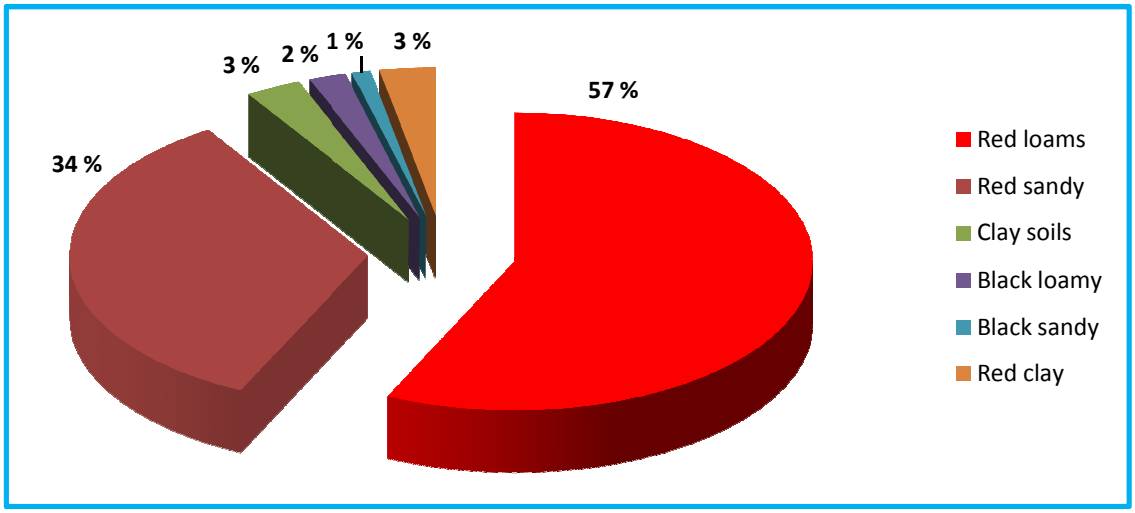
Land utilization pattern in the district (ha)

S.no	Particulars	Area
1	Forest	451345
2	Barren & Uncultivable land	164265
3	Land put to Non-agrl. uses	142242
4	Permanent pastures & other grazing lands	36521
5	Miscellaneous tree crops & groves not included in net area sown	25173
6	Cultivable waste	39512
7	Other fallow lands	126287
8	Current fallows	161759
9	Net area sown	351674

10	Total geographical area	1498778
11	Total cropped area	390336
12	Area sown more than once	36283
13	Gross Irrigated Area (Ha)	167676
14	Net area Irrigated	131393
15	Area irrigated more than once	36283

2.7 Soils

Red soil occupies major portion of the district.



The fertility status of the soils of the district in general is

Organic matter	:	Low
Nitrogen	:	Low
Phosphorous	:	Low to Medium
Potash	:	Medium to High
P^H	:	6.5 to 8.0
Zinc	:	Deficiency is identified in all parts of the district
Iron	:	Deficiency observed in Sugarcane and Groundnut areas
E.C	:	Normal
Water holding capacity	:	Low to Moderate

2.8 Farming situations

Farming situation	Mandals covered	Crops and cropping pattern
Rainfed red soils	Peddamandyam , Mollakala chervu, Madanapalli, Nimmanapalli, Chowdepalli, Bangarupallem, Chittoor, Yadamari, G.D Nellore, Palasamudram, Palamaneru,	Groundnut +Redgram Bajra Rainfed Tomato
Canals (Araniyar, Swarnamukhi, Ayacut area)	Srikalahasti, Thotambedu, B.N.Kandriga , Yerpedu, Narayanavanam, Puttur, Nagiri, Vedurukuppam	Rice- groundnut, Sugarcane, Sunflower Bajra Vegetables
Rain fed tanks/ Bore wells	Tamballapalli, PTM, Ramasamudram, B.Kothakota, Punganoor, V.kota, S.RPuram Santhipuram, Ramakuppam, Gudipala, Tavanampalli, Penumuru, Karvetinagaram, Vijayapuram	Ground nut, Rice, Tomato, Maize, Sunflower
Wells / bore wells	Kurabalakota, Guramkonda, Peddapanjani, Gangavaram, Somala, Sadum, Pulicherlla, Gudipalli, Kuppam, Puthalapattu, Irala, Pakala, Chandragiri, Renigunta, KVBpuram, Varadayapalem, Nindra, Pichatur, Nagalapuram	Rice, Groundnut, Tomato, Jowar, Maize, Vegetables
Horticulture crops	Kuppam,Madanapalli, Mollakalachervu, Satyavedu, RCPuram, Tirupati, Kalakada, Valmikipuram, Kalikiri, Chinnagottigallu, Ropicherla	Mango, Cashew, Papaya, Vegetables, flowers, Banana

2.9 Area, Production and Productivity of major crops

Sl.No.	Crop	Kharif			Rabi		
		Area(ha)	Production (MTs)	Productivity (Kg/ha)	Area(ha)	Production (tons)	Productivity (Kg/ha)
1	Paddy	16224	52728	3250	43240	142692	3300
2	Jowar	1363	874	641	-	-	-
3	Bajra	3048	8885	2915	-	-	-
4	Maize	969	5814	6000	625	3760	6000
5	Ragi	6978	13956	2000	844	1772	2100
6	Minor millets	312	218	700			
7	Red gram	11218	5609	500			
8	Horse gram	2131	1236	580	1702	1277	750
9	Green gram	838	272	325	402	221	550
10	Black gram	656	246	375	1164	757	650
11	Cow pea	1367	376	275	-	-	-

12	Other pulses	2255	1015	450			
13	Groundnut	148203	177844	1200	13653	33859	2480
14	Sunflower	534	988	1850	1090	2267	2080
15	Sesamum	198	42	210	314	212	676
16	Castor	164	107	650	-	-	-
17	Chillies	474	1683	3550	-	-	-
18	Sugarcane	26525	1989375	75000	-	-	-
19	Onion	156	2371	15200	-	-	-

Source: Office of Joint Director of Agriculture, Chittoor

AREA, PRODUCTION AND PRODUCTIVITY OF HORTICULTURE CROPS IN CHITTOOR DISTRICT

S.No	Name of the Crop	Area (Ha)	Production (M.T)	Productivity (T/Ha)
1	Mango	60407	483256	8
2	Lemon (Lime & Other Citrus Fruits	232	3202	14
3	Banana	1100	25300	23
4	Tomato	14588	262584	18
5	Potato	1892	30272	16
6	Beans	1424	8544	6
7	Brinjal	1677	33540	20
8	coconut	4165	31.934	
9	Chillies	3242	7781	3
10	Tamarind	2499	24990	10
11	Chrysanthemum	355	3550	10
12	Crossandra	385	1155	3
13	Jasmine	478	1912	4
14	Marigold	261	1305	5

Source: Office of Asst Director of Horticulture, Chittoor

2.10 LIVESTOCK & POULTRY POPULATION

- Cattle - 1104349
- Buffaloes - 139759
- Sheep - 1124890
- Goat - 490931
- Pigs - 7208
- Poultry - 14398793

3 ABOUT THE INSTITUTION

3.1 Host Organization:

Rashtriya Seva Samithi (RASS) has been established in 1981, with registered office at Tirupati in Andhra Pradesh. RASS – Rashtriya Seva Samithi (formerly known as Rayalaseema Seva Samithi) presently operates in five states of India Andhra Pradesh, Karnataka, Orissa, Tamil Nadu and Delhi.

RASS is currently implementing 30 different welfare and development programmes with the funding support from Govt. of India, State Governments of Andhra Pradesh, Orissa, Karnataka, Tamil Nadu, International Donor agencies and Philanthropists.

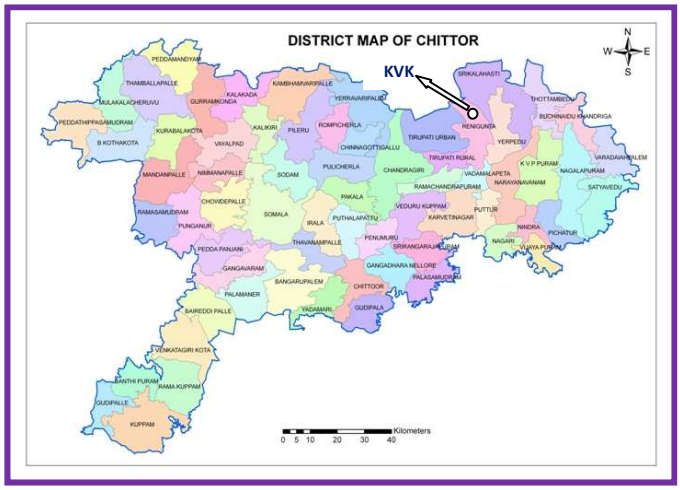
The emphasis of most of these programmes is on Women and Child Development, the disabled, the disadvantaged sectors of the people and on rural development. However, RASS serves all the sections of the society to deserve its services. RASS designed its programmes to suit the requirements of the people in various walks of life. It has programme presence in over 2560 villages. Through these programmes RASS is serving around 3.10 million people in five states. RASS Human Resources comprises of 3695 regular and part time interns besides a number of volunteers who rendered their service to humanity through different programmes for 30 years of committed and dedicated service.

RASS believes in community participation. It ensures community participation in need identification, designing, implementing, contributing and monitoring. RASS facilitates the community in the process of asset creation, ownership and management. It promotes community owned, operated and managed peoples institutions.

In its 30 years of service, RASS was conferred with various national and international awards like

- National prestigious Rajiv Gandhi Manav Seva award (2006) for outstanding work in the field of child welfare and disable

- India Rotary award (2004) for outstanding work for enhancement and employment opportunities in rural area
- FICCI award (1997) for its outstanding work in the field of rural development
- The Jamnalal Bajaj award (1995) for application of Science and Technology for Rural development
- Priyardarshini Indira Gandhi award (1992) for contribution to National integration
- Indira Gandhi National Award (1989) for contribution to national unity
- National award (1989) for outstanding contribution to child development etc., and many other individual awards for Dr.G.Muniratnam, General Secretary of RASS



3.2 Acharya Ranga Krishi Vigyan Kendra (ARKVK)

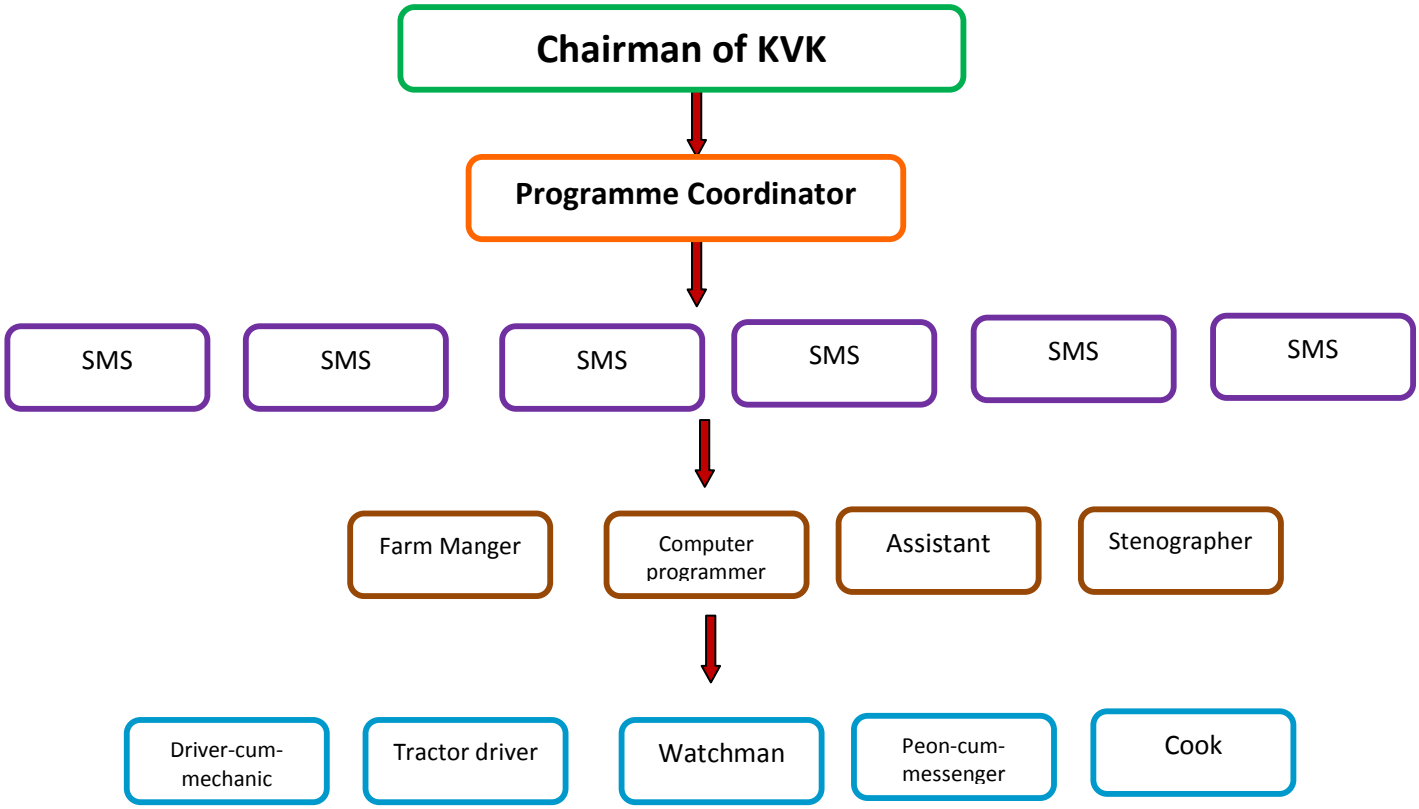
The Acharya Ranga Krishi Vigyan Kendra (ARKVK) one among the RASS family sanctioned by the Indian Council of Agricultural Research (ICAR) and established in December 1992. ARKVK is an innovative institutional model for assessment, refinement and on farm demonstration of agricultural technologies and training of farmers and extension personnel. The Kendra is located 20 kms far from Tirupati town at Karakambadi panchayat, Renigunta mandal on the Chennai-Mumbai National highway. For the past 19 years, KVK is rendering its services for the socio-economic upliftment of farming community in Chittoor district through continued transformation in its functioning.

3.2.1 Mandates of KVK

- To conduct "On farm testing" for identifying technologies in terms of location specific sustainable land use systems
- To organize front line demonstrations on various crops to generate production data and feed back information
- To organize training to update the extension personnel with emerging advances in agricultural research on regular basis
- To organize short and long term vocational training courses in Agriculture and allied vocations for the farmers and rural youth with emphasis on "learning by doing" for higher production on farms and generating self employment

3.2.2 Staffing pattern and staff of KVK

The KVK has a multi disciplinary technical team from the disciplines of Crop Production, Crop Protection, Agricultural Extension, Horticulture, Home Science and Sericulture to cater needs of different sectors of farming community in the district. The staffing pattern of the KVK is as follows.



3.2.3 Infrastructure facilities at KVK

Sl.No	Name of building	Source of funding	Plinth area
1.	Administrative Building	ICAR	696 Sq.m
2.	Farmers Hostel	ICAR	372 Sq.m
3.	Staff Quarters (14)	ICAR	880 Sq.m
4.	Demonstration Units (2)	ICAR, DRDA DWCD	462 Sq.m
5	Fencing	ICAR	1000m
7	Threshing floor	NMPB	-
8	CC Road	ICAR	330m

9	Vehicle shed	ICAR	150sq.m
10	Dairy unit	ICAR	80Sq.m
11	Home Science block	ICAR	410 Sq.m
12	Soil testing lab	ICAR	-

Adminitrative building cum Seminar hall

HomeScience Block

Farmers Hostel

Sericulture Hostel

4. Interventions of KVK in the district

4.1 Technology Assessment and Refinement through On farm testing

Technology assessment and refinement refers to a set of procedures whose purpose is to develop recommendations for a particular agro climatic situation or location through assessment and refinement of recently released technology through participatory approach. It refers to the process or a set of activities before taking up new scientific information for its dissemination in a new production system.

An On farm trial aims at testing a new technology or an idea in farmers fields, under farmers conditions and management, by using farmers own practice as control.

KVK has assessed about 31 technologies under different thematic areas and crops in the farmers field for which the technologies recommended by the ICAR, SAUs etc,. The thematic areas included varietal assessment in different crops, nutrient management, weed management, resource conservation, pest and disease management, micro irrigation and farm mechanization, Animal Husbandry, Sericulture, Home science and Horticulture.

S. No.	Problem identified	Trial conducted	Treatments	No. of locations	Results
1.	Poor yields and more pop up's in Groundnut	Gypsum application in Rabi Groundnut	T_1 : Farmers practice T_2 : Gypsum applied @ 500 kg /ha	15	Farmers obtained 500 kg of extra yield per hectare; improvement in pod size, oil content, shelling out turn.
2.	Improper pod formation, black spots on the pods, more number of small sized pods due to nematodes	Management of Kalahasthi malady in Groundnut	T_1 : Farmers practice T_2 : Sumhemp trampling before showing of Groundnut and Furadon 3G application	20	Kalahasthi malady was effectively controlled and there was an yield increase of 650-700 kg of Groundnut pods per hectare
3.	Micro nutrient deficiency of Sulphur	Basal application of Sulphur for Rabi Paddy crop	T_1 : Farmers Practice T_2 : Sulphur application as basal dose @ 45 kg per hectare along with N, P, K fertilizers	14	An extra yield of 450 kg/ha was obtained
4.	Severe damage of Tikka disease.	Tikka leaf spot control in Groundnut	T_1 : Farmers Practice T_2 : Spraying of chlorothalonil @ 0.75 ml per ltr water, twice at an interval of 15 days	20	Tikka leaf spot was effectively controlled with an extra yield of 140 kg/ha
5.	Cost of maintenance of kitchen garden is increasing due to inorganic fertilization.	Vermicompost application in kitchen garden	T_1 : Farmers Practice T_2 : Application of Vermicompost @ 250 kg per kitchen garden	23	Productivity of vegetables increased by 20-25 % over the control

Phosphorous management in Paddy by applying PSB

Testing the performance of Groundnut varieties

Testing the performance of TIR-9 Groundnut variety

Soil test based fertilizer application in Paddy

Testing the performace of 2003V46 Sugarcane variety

6.	Pest and disease problem in increasing due to indiscriminate use of inorganic fertilizers	Vermicompost application in Mulberry crop	T_1 : Farmers usual Practice T_2 : Basal application of Vermicompost to Mulberry crop @ 5 ton/ha	9	A 10 % extra yield was recovered and the leaf quality was very good
7.	Poor yields in Mango due to improper and inadequate irrigation facilities in mango under rainfed situations	Micro irrigation in Mango through earthen pots	T_1 : Farmers Practice T_2 : Irrigation by using earthen pots	20	48 % increase over control plot was obtained
8.	Poor yields due to poor plant population in rainfed groundnut due to mortality of plants by root grub	Root grub control in Groundnut	T_1 : Farmers Practice T_2 : Seed treatment with chloropyriphos	26	An extra yield of 45 % was obtained from trial plot
9.	Low yields in Paddy	Introduction of high yielding variety of Paddy – APHR-2	T_1 : Local variety T_2 : APHR-2	12	60 % increase in yield over check plot
10.	Reduction in paddy yields due to weeds and increased cost of weeding due to manual weeding operation.	Weed management in Paddy through herbicides	T_1 : Farmers Practice T_2 : Butachlor application @ 2.5 lt/ha, 5 days after transplanting	24	Grasses and broad leaved weeds were effectively controlled and hence cost on labour for 2nd manual weeding was reduced. A Benefit Cost ratio of 2.02 was observed
11.	Low yields in rice due to Zinc deficiency	Correction of zinc deficiency in Paddy	T_1 : Control plot T_2 : Zinc Sulphate application as basal @ 50 kg/acre	35	Crop has shown a good response to fertilizer applied and zinc deficiency was not observed. An additional 300 kg/ha yield was obtained
12.	Poor yields in groundnut from the existing cultivars.	Testing the performance of TAG-24 Groundnut variety	T_1 : JL-24 T_2 : TAG-24	18	An additional 50 % yield was obtained by the farmers over the check variety
13.	Severe crop loss due to Blast disease in Paddy	Blast management in Paddy	T_1 : Farmers Practice T_2 : Spraying of Edifenphos and Tricyclozole alternately	22	Blast was effectively controlled when compared to the plot where farmers usual practices were followed

14.	Cost of management of milch animals is increasing thereby reducing the net returns to the dairy farmer.	Comparison of grass + legumes Vs grass + concentrate feed for milch animals for higher milk yields	T_1 : 1. NB21 fodder 2. Co + fodder 3. Sun hemp 4. Cow pea 5. Pillipesara T_2 : 1. NB-21 fodder 2. Co-1 fodder 3. Concentrate feed	10	Higher milk yield was obtained when animals were fed with grass + legume fodder in comparison to feeding with grass + concentrate feed. Since concentrate feed is costlier than legume fodder, farmers can obtain higher milk yield with low input cost.
15.	Cost of concentrate feed is high and hence cost of milk production is increased. A lot of surplus mulberry foliage is wasted after feeding to silkworms.	Improvement in milk yield by feeding mulberry to milch animals	T1 : Feeding with locally available green fodder, Paddy straw and Groundnut cake and occasionally concentrate mixture. T2 : Standard feed (Paddy straw – 4 kg; green fodder – 10 kg; concentrate mixture 4-5 kg; mineral mixture 30-50 gm/day/animal; salt – 5 gms) T3 : Replacement of 1 kg of concentrate mixture in the standard diet by mulberry leaves wt/wt basis.	5	Milk yield in litres per day: T_1 : 8 T_2 : 12 T_3 : 14 One acre of mulberry garden can produce 10000-12000 kg of mulberry leaf per year from which 500-600 kgs of cocoons are produced. During this activity about 20 % (350-400 kg per acre per crop) of leaf and on twigs which is considered as bed refusal is fit to use as fodder for the cattle. It will be sufficient for 2 cattle along with silkworm rearing and also compared to the cost of concentrate mixture, the mulberry leaf stalk are low cost / no cost alternative fodder for the cattle.
16.	Poor yields in Groundnut due to micro-nutrient deficiencies	Micro nutrient management in Groundnut	T1:Farmers practice T2:10 kg ZnSO4,5 kg FeSO4,5kg Borax,2.5 kg CuSO4	19	Farmers had to invest an additional amount of Rs.2000 per Hectare for supplement of Micronutrients and fetching a net return of Rs.5350 per ha.
17.	Low yields in groundnut with the	Testing the performance of TIR-	T1:JL-24 T2:TIR-25	14	About 8% yield increase was observed in TIR-25

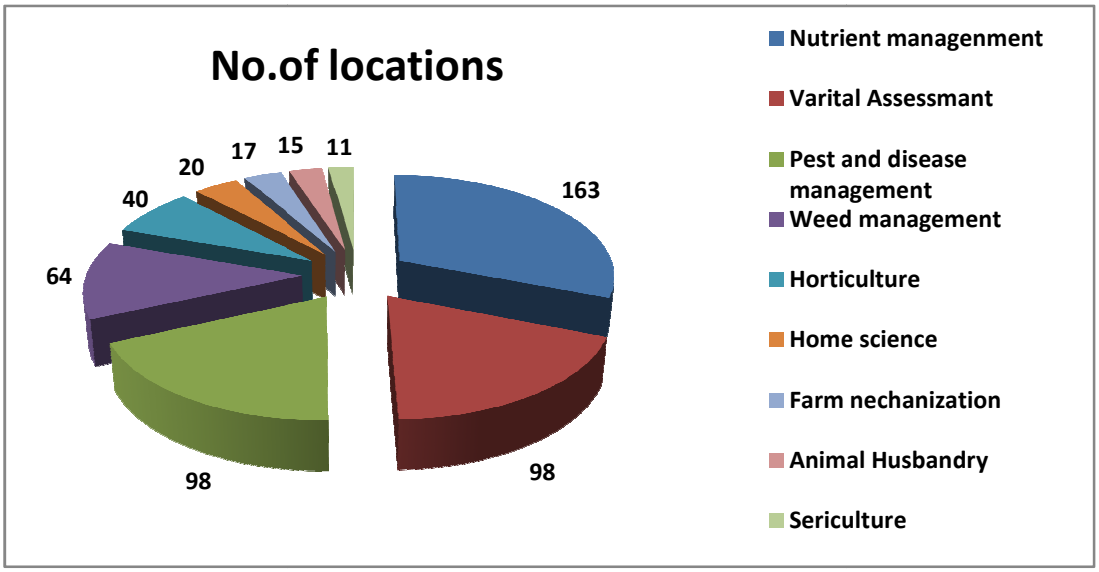
	existing varieties	25groundnut variety			compared to JL-24
18.	Indiscriminate use of inorganic fertilizers is increasing the cost of cultivation and deteriorating the soil health	Soil test based fertilizer application in Paddy	T1: Farmers practice T2:Soil test based nutrient application	25	Soil test based fertilizer application minimises the cost of fertilisers as well as cost of cultivation and also achieved10% additional yield.
19.	Manual weeding is costly and weeding is not completed in time due to non-availability of labour	Chemical weed management in Paddy	T1:Hand weeding – 2 times T2: Pre emergence application of Pretilachlor-1.0lt/ha + one hand weeding at 30DAT	40	Chemical control of weeds not only reduces cost of cultivation and also controls weeds in time and results in 8-10% higher yields.
20.	Non-availability of suitable high yielding groundnut variety under rainfed situation	Testing the performance of Kadiri-6 groundnut variety under rainfed conditions	TI:JL-24 T2:Kadiri-6	10	About 18% yield increase was observed in the case of K-6
21.	Low yields coupled with poor quality of Mulberry leaf and increased cost of cultivation	Soil test based fertilizer application in Mulberry	T1: Farmers method of fertilizer application 8 ton FYM+200kg N+91kg P_2O_5 +91kg K_2o / acre / year. T2: Soil test based fertilizer application proportionately reducing inorganic fertilizers 4 ton Vermicompost + 131 kg N + 42kg P_2O_5 + 42kg K_2o / acre / year.	5	Reduction of inorganic fertilizers; improvement in quality of mulberry leaf observed due to application of Vermicompost
22.	Non-availability of short duration high yielding Red gram variety	Testing the performance of TRG-22 Red gram variety	T1: Chittoor local T2: TRG-22	27	About 20-30% yield increase was observed in the case of TRG-22 variety
23.	Poor flower initiation in Mango due to unfavourable climatic conditions	Flower initiation in Mango trees	T1: Farmers practice (158:25:25 NPK kg/ha) T2: Pruning + RDF (N-1kg, P_2O_5 1kg, K_2O 1 kg/Plant + KNO_3 – 5 g/l (Foliar spray) T3: Pruning +RDF (N-1kg, P_2O_5 1kg, K_2O 1 kg/Plant+KH_2PO_4 – 2 g/l (Foliar spray)	10	The impact of foliar spray is clearly seen on Khadar variety followed by Baneshan and Totapuri varieties.
24.	Increased cost of cultivation in Paddy due to increased use of in organic fertilization	PSB application in Paddy	T1:Farmers practice T2:Soil test based NPK + PSB application-2.5kg/ha	23	About 5% yield increase was observed in the case of T2 treatment and also reduced the usage of chemical

					fertilizers.
25.	Non-availability of suitable high yielding groundnut variety under irrigated dry situation	Testing the performance of TIR-9groundnut variety	T1:JL-24 T2: TIR-9	7	Significant difference in the yield of TIR-9 was not observed.
26.	Non availability of labour leading to delayed transplanting, high Cost of transplanting operation,	Performance of paddy transplanter	T1: Manual transplanting T2:Transplanting with transplanter	17	Labour cost, time for transplanting reduced. About 8-13% yield increase was observed in the T2 treatment.
27.	Severe damage to Paddy fields due to Blast disease and reduction in yields	Performance of blast resistant paddy varieties	T1:BPT-5204 T2:NLR-34449 T3:NDLR-7	10	Blast incidence was less in the case of NLR-34449 when compared to BPT-5204 followed by NDLR-7. Higher yield was recorded in NDLR-7 compared to the other two varieties.
28.	Malnutrition observed in children and hence supplementary nutrition observed by feeding	Supplementation of Amylase rich foods for anganwadi children	T1: Usual diet T2: Ready To Eat food + usual diet T3: Ready To Eat food + Usual diet + Amylase rich food	10	Anthropometry measurements A. Height – 96.6 cms B.Weight – 13.8 kg C.Head circumference – 28.3 cm
29.	Non availability of high yielding Groundnut variety under Irrigated dry conditions	Testing the performance of TG-37Agroundnut variety	T1:TAG-24 T2:TG-37A	10	Problems like in situ germination and more no of immature pods as observed in TAG-24 were not observed in TG-37A variety
30.	Cost of rearing Chawkie worms is high and a low cost alternative is needed.	Creating Micro environment to the chawkie worms	T1:Chalkie rearing by using bamboo trays T2: Recommended practice (bamboo trays, plastic trays by using paraffin paper and foam pads) T3:Chalkie rearing by using plastic trays with banana leaf and bark	5	Banana leaf & bark are locally available for all farmers and therefore maintenance of both temp & humidity is easy.
31.	Incidence of Uzi fly is severe and the control measures used by the farmers	Integrated management of Uzifly in silk worm	T1: Farmers practice (physical method-netting the doors and windows of the rearing shed using nylon	5	Farmers expressed that the performance of N.Thymus pouches in controlling Uzi fly is

	is not effective.		net) T3: Recommendd practice (physical_chemical methods-apply nylon netsand anti chamber to prevent entry of uzi flies, placing uzi trap near doors and windows, application of uzicide @ 5-6 ml/sq.ft.) T3: physical methods+chemical methods+biological methods-releasing 2 pouches of Nesolynx Thymus/100 dfls during 2nd day of 5th instar stage,mounting stage and in compost pits		good and cost effective.

KVK has conducted 8 on farm testing's under nutrient management, 7 trials of varietal assessment, 5 trials of pest and disease management, 3 trials each under horticulture and sericulture, 2 each under weed management, home science, farm mechanization and animal husbandry in different crops and farming situations of the district.

Thematic area wise number of locations under On -farm testing's conducted by KVK



4.2 Generation of production data through Front Line Demonstrations

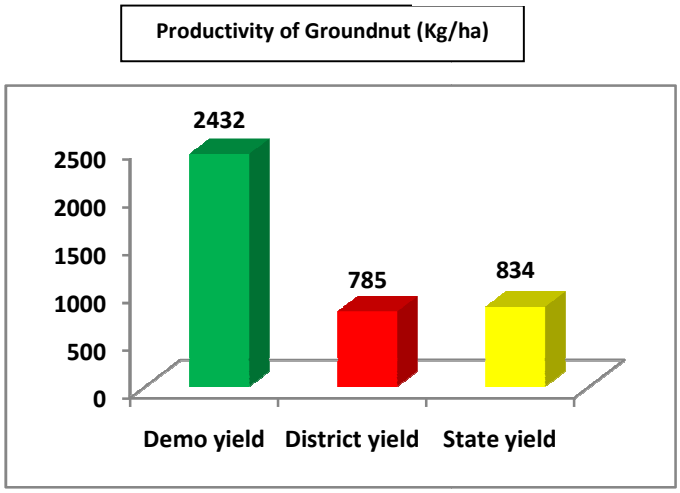
The field demonstrations conducted under the close supervision of the scientists are called Front line demonstrations (FLDs) because the technologies are demonstrated for the first time by the scientists themselves before being fed in to the main extension system. The main objective of FLDs is to demonstrate latest crop production technologies and its management practices in the farmer's fields under different agro climatic regions and framing situations.

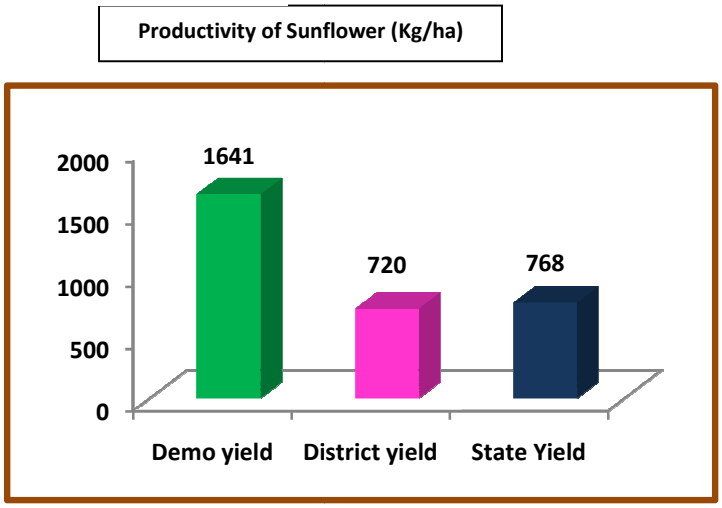
S. No.	Crop	Components demonstrated	No. of farmers	Area (ha)	Impact
1	Groundnut	Varietal / IPM / INM / IWM/whole package	878	453.5	Popular local varieties like JL-24, TMV-2 were replaced by high yielding latest varieties like K-134, TCGS-320, TPT-4, TAG-24, TG-37A, TCGS-29 and TPT-25. 15-25 % increase in the yields was observed. IPM practices were adopted by majority and effectively managed Red hairy Caterpillar and Spodoptera with reduced input costs. Farmers were habituated to practice best management practices.
2	Sun flower	New hybrids/Nutrient management/spacing	46	15	About 10-14% yield increase was achieved by adopting optimum spacing and spraying of boron at star bud stage. The yields of NDSH-1 hybrid were on far with private hybrids.

FLD in Groundnut on Micro nutrient management

Joint Director of Agriculture, Chittoor visited the FLD, Sunflower plots

Dr.N.Sudhakar ZPD visited FLD plot of Groundnut



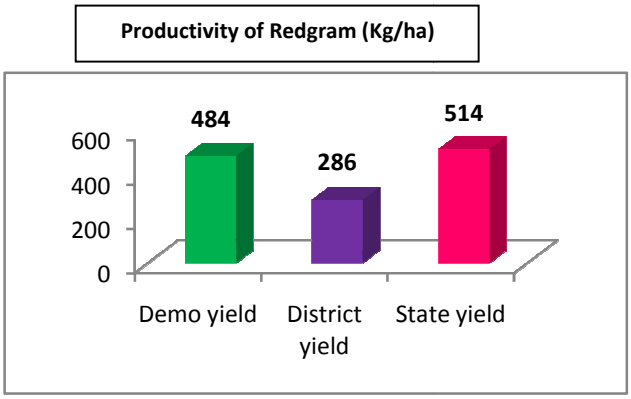


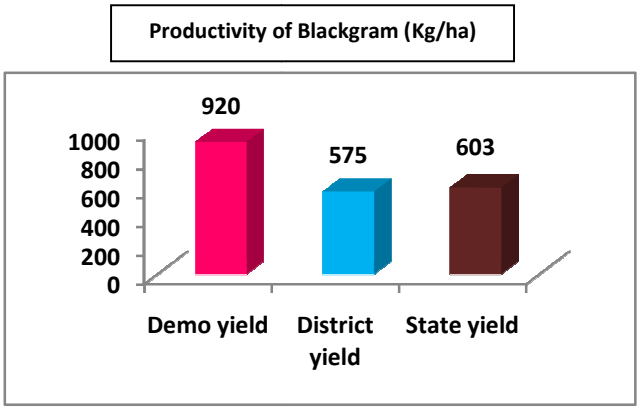
S. No.	Crop	Components demonstrated	No. of farmers	Area (ha)	Impact
3	Maize	New hybrids	20	15	About 5% yield increase was observed in HQPM-1 compared to Kaveri-60
4	Blackgram	Varietal	62	31	High yielding varieties like PBG-22 and PBG-1 replaced the local varieties.
5	Redgram	Varietal / IPM	67	31	High yielding varieties like LRG-30, LRG-41 and TRG-22 were introduced. 30 and 32% yield increase was observed in LRG-41 and TRG-22 respectively when compared to local variety.

6	Sesamum	Varietal	10	5	The local varieties were replaced with the high yielding varieties like YLM-11and YLM-66. About 21 and 22% yield increase was noticed in the case of YLM-66 and YLM-11 respectively.

Varietal demonstration of Redgram

Varietal demonstration of HQPM-1 Maize hybrid



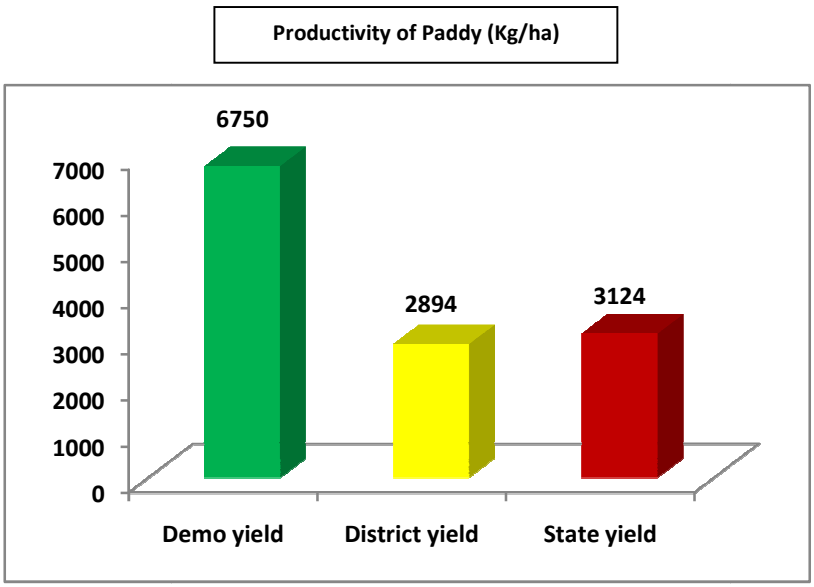


7	Paddy	Varietal / System of Rice Intensification/ Weed management	75	97.6	High yielding and disease resistant varieties were promoted. Water saving technology called **SRI** is being popularized in a big way in the district. Integrated weed management practices were popularized.

8	Paddy	Direct seeding in rice with drum seeder	147	77.5	The resource efficient technology, Direct seeding in rice was well adopted by the farmers in large scale in the district. The technology was spread throughout the district because of saving of labour, seed, time and water and also reduces cost of cultivation.

Demonstration on direct seeding in Rice using drumseeder

Demonstration on System of Rice Intensification (SRI) in Rice

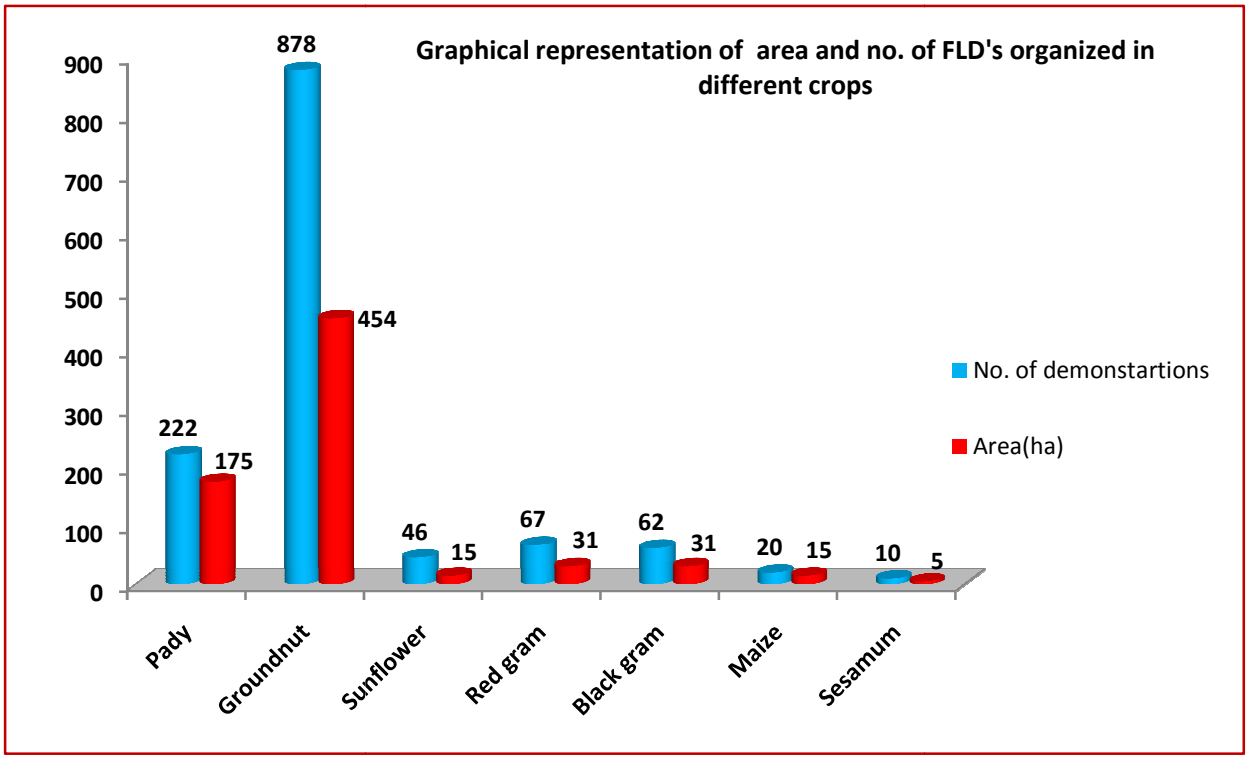


9	Horticulture	Micro nutrient management in Jasmine/VAM application in Banana/staking technique in Tomato	40	`15	In jasmine the size of bud and quality of flower increased and dropping of flower reduced. In banana root rot damage is negligible because of VAM application. lodging also reduced. Because of staking damage of fruits was reduced by 30% and shelf life of fruits increased.
10	Home science	Drudgery reduction/back yard poultry/	30	-	Time and stress of women for harvesting decreased, shelf life flower increased
11	Sericulture	Incubation of eggs using hydrodynamic incubators/disinfection of trays, chandrikas / chawkie rearing/pruning in Mulberry/	84	-	Hatching% of eggs increased, pest and diseases of silk worms controlled. Farmers able to maintain ambient temperature in rearing houses. Pruning leads to get quality of leaf.

Demonstration of staking practice in Tomato

Pruning in Mulberry to improve the yield

Distribution of cotton harvest bags for floriculturefarmers under FLD's



4.3 Capacity building of different stake holders

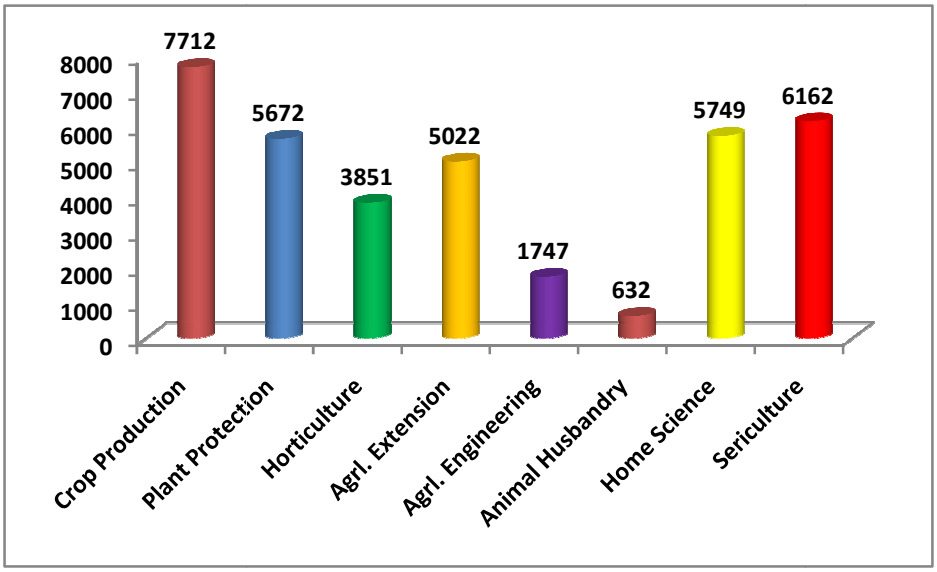
Capacity building of different stakeholders like Practicing farmers, Rural youth and Extension functionaries through interactive lecturette's is a prerequisite for orienting the farmers to adopt suitable technologies. ARKVK is well equipped with all the required training material, audio visual equipments like LCD projector, competent technical team etc to deliver the goods effectively. By imparting training, improvement in Knowledge and skills of the trainee is ensured for effective application of the technology in the fields by the farmers.

An overview of different training courses conducted for *Practicing farmers and Rural youth* by ARKVK from 1992-93 to 2009-10

Sl.No	Discipline	No. of Courses	No. of Participants
1	Crop Production	406	7712
2	Plant Protection	280	5672
3	Horticulture	165	3851
4	Agrl. Extension	233	5022
5	Agrl. Engineering	70	1747

6	Animal Husbandry	28	632
7	Home Science	403	5749
8	Sericulture	362	6162
Total		**1947**	**36547**

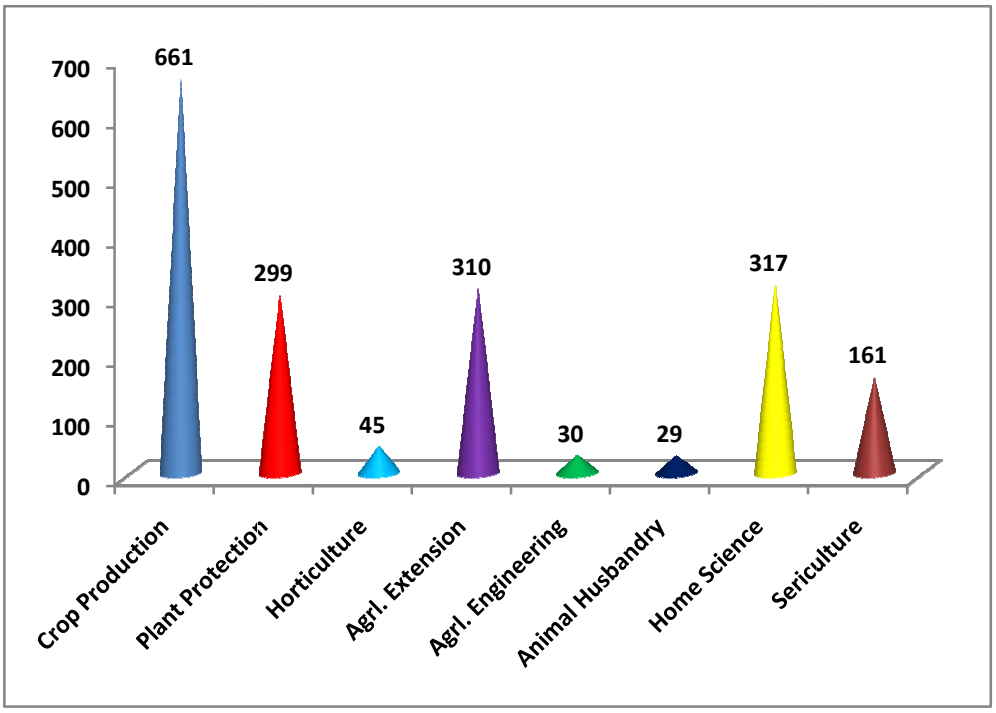
No. of participants trained under different courses (1992-93 to 2009-10)



<u>An overview of different training courses conducted for *Extension Functionaries* by ARKVK from 1992-93 to 2009-10</u>

Sl.No	Discipline	No. of Courses	No. of Participants
1	Crop Production	32	661
2	Plant Protection	14	299
3	Horticulture	2	45
4	Agrl. Extension	12	310
5	Agrl. Engineering	1	30
6	Animal Husbandry	2	29
7	Home Science	31	317
8	Sericulture	11	161
Total		**105**	**1852**

No. of extension functionaries trained under different courses (1992-93 to 2009-10)



Training programmes for practicing farmers

Training programme for women farmers on drudgery reduction in Agriculture

Training programme on resource efficient rice production technologies for women farmers at Kuppam

Training programme on Production technologie Redgram at K.V.Palli mandal

Village level training programme for Sericulture farmers of Vedurukuppam mandal

Training programme on management of farmer's groups at Vedurukuppam mandal

Training programme on value addition to women farmers of Renigunta mandal

Areas on which training programmes were given to the farmers and extension functionaries:

Discipline : Crop Production

- Resource efficient technologies in Paddy like System of Rice Intensification (SRI),Direct seeding in Rice with drum seeder
- Groundnut production technology (Kharif & Rabi)
- Soil & water management in dry land agriculture
- Fertilizer management in major crops (Green manuring, Bio-fertilizer application, Neem coated urea application, Gypsum application etc.)
- Maize production technology
- Importance of soil testing and fertilizer application based on soil test
- Preparation of Vermicompost, its application and uses
- Sugarcane production technology
- Production technology of Pulses
- Weed management in major crops
- Importance of mechanization
- INM in Paddy and Groundnut
- System of Sugarcane Renewed Intensification.

Discipline : Plant Protection

- IPM in Groundnut
- INM in Paddy
- Pest management through application of Botanical pesticides and their preparation
- Preparation and application of NPV to control Spodoptera in Groundnut
- Pest management in Sugarcane
- Insect pest and disease management in vegetables
- Pest and disease management in Paddy nursery
- Pest and disease control in Mango

Training programmes for extension functionaries

Training programme for women extension functionaries on mechanization in major crops

Dr.K.Raja Reddy, Assoc.Director of Research, addressing the trainees at Training programme on "Mechanization in Paddy" for Agrl.Extension Officers

Training programme on Sustainable Agriculture for Agricultural Officers of Chittoor district

Training programme on Mechanization for Agrl.Officers & Asst. Directors of Agrl.

Training programme for extension functionaries on fruit & vegetable processing

Training programme for extension functionaries on Micro irrigation management

Discipline : Agricultural Extension

- Introduction and motivation of fodder cultivation
- Orientation programme on “Raithu mithra groups” for agricultural officers
- Medicinal plants cultivation and its prospects
- Motivating the farmers to take up maize cultivation as an alternate to the existing cropping systems
- Establishment and management of Rythu clubs
- Farmers clubs and group approach
- Importance of micro irrigation in horticultural crops
- ASA technique for Extension functionaries
- Impact of WTO on Indian Agriculture
- Farm planning, management and budgeting
- Effective utilization of agricultural inputs for better yields
- Direct seeding with drumseeder
- mechanization in major crops and its advantages
- Management of women self help groups
- Popularization of on-going developmental programmes
- Seed village concept
- Use of ICT in Agricultural Extension for line department officials.

Discipline : Horticulture

- Importance of pruning and trimming in horticultural crops
- Diagnosis and management of micro nutrient deficiency in Banana crop
- Improved package of practices for winter vegetables
- In situ grafting and budding method for Mango & ber
- Bio-fertilizer application in horticultural crops
- Improved nursery management practices for tomato, brinjal and chillies
- Use of growth regulators in horticultural crops
- Control measures for inflorescence and fruit drop in coconut

- Post harvest technology for major fruit crops
- Cultivation practices of tissue culture teak plants

Discipline : Home Science

- Maintenance of nutrition garden
- Clean milk production techniques
- Mushroom cultivation
- Preparation of decorative articles with mestha fibre, pierced cocoons etc.
- Maintenance of thrift and credit groups
- Preservation of fruits and vegetables through preparation of Jams, jellies, pickles etc.
- Vermicompost preparation
- Agarbathi making
- Tailoring as an income generating activity

Discipline : Agricultural Engineering

- Introduction of non-conventional energy resources
- Use of drip irrigation for horticultural crops
- Labour saving implements and tools for dry land agriculture like preparatory cultivator, sowing equipment, harvesting equipment etc.
- Watershed management techniques
- Maintenance of agricultural pumpsets and tractors
- Scientific method of grain storage

Discipline : Sericulture

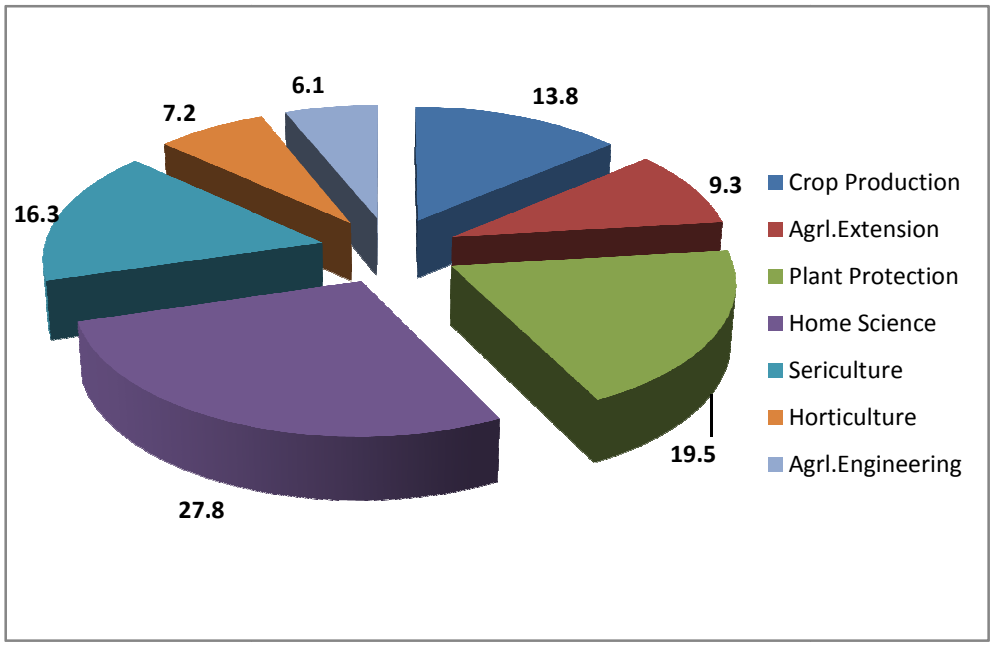
- Use of low cost incubators in Silkworm rearing
- Management of Tukra disease
- Prophylactic measures for prevention and control of diseases in silkworms
- Role of Disinfection in Silkworm rearing
- Chawkie rearing management
- Application of foliar sprays on Mulberry crop

- IPM in Mulberry
- Introduction of high yielding V_1 variety and its package of practices
- Management of Silkworm rearing in winter
- Vermicompost preparation and its application in Mulberry
- Management of bivoltine Silkworm rearing
- Preparation of Medicinal products from Aloe Vera

4.4 Technical support to unemployed youth through vocational courses:

Organizing short and long term vocational training courses in Agriculture and allied vocations for the farmers and rural youth with emphasis on "Learning by doing" for higher production on farms and generating self employment is one of the mandate of KVK. Keeping in view the resources available with the rural youth, ARKVK has organized different income generating courses which are technically and economically feasible and viable.

Vocational courses conducted in different areas (in %)



<u>Areas in which vocational courses were given:</u>

- Vermicompost preparation
- Mushroom production
- Preparation of neem based products
- Village Veterinary Guides

- Nursery management
- Preparation of decorative articles with damaged cocoons
- Fruit / Vegetable processing
- Value addition to Cereals, Pulses, Millets and Oilseeds
- Tailoring cum embroidery
- Repair and maintenance of farm machinery
- Zardosi works, Arya work & Fabric painting
- Groundnut seed production
- Improving productivity in Sericulture
- Dairy management

Long term training on Arya work, painting on sarees

One month training programme on Banana fibre extraction and preparation of decorative articles

Mushroom production training for rural youth

Vocational training course on preparation of decorative articles with damaged cocoons

Vocational couse on grafting and nursery management in Mango

Some of the entrepreneurs developed after attending the vocational courses given by KVK:

Tailoring as an income generating activity – Smt K.Rajeswari W/o K.Subramanyam hails from Gudimallam village of Yerpedu mandal started tailoring profession after completing training course given by KVK. She became a member of SHG of RASS and took loan from the group for starting the enterprise. She started a unit with a single sewing machine during 1995 and now she has three machines employing one permanent and two temporary staff. She is successfully running this enterprise for the past 15 years with an average annual income of Rs.90000 / year. Customers from near by villages as well as nearby towns like Renigunta and Tirupati give their materials for stiching and designing.

Mushroom production as an additional income source – Sri Satish of Avilala village, Tirupati rural mandal started a mushroom production unit after training from KVK and the size of the unit was 200 units. He started this unit during 2004 and had good marketing opportunities in the beginning. He made a tie up with an agent in Bangalore and supplied packed Milky mushroom regularly by bus transport. The average annual income was Rs.63000 / year. After two years he faced problem with Bangalore agent and payments were not prompt. Due to financial constraints he closed the mushroom production unit during 2007.

Sericulture as a sustainable income generating activity – Sri K.Pushpananda Reddy of Chinnamareddy kandriga village, Upparapalli post, Vedurukuppam mandal has adopted Sericulture enterprise in addition to Agriculture. The entrepreneur adopted new technologies recommended by KVK like green manuring & mulching in Mulberry, pruning of mulberry, V1 mulberry variety with wider spacing, shoot rearing, separate chawkie garden, disinfection methods, mounting

techniques etc. Disease free layings are procured from Private Grainages of Palamaneru and Govt. Grainage at Madanapalli. The Cocoons produced are sold at Madanapalli market and also at Chillagadda & Chintamani markets of Karnataka depending upon the market rates prevailing on that day. On an average his returns from his sericulture unit is about Rs.370000/ha/year.

Village level fodder bank - In 2 acres of his land Shri.K.Madhava Reddy of Karakampalli village of Bangarupalem mandal is raising 85 fodder varieties i.e Guinea, Napier and tree species. He collected all the species from A.P, Karnataka, Tamil Nadu and Kerala states. For the past 12 years he is doing research on all these varieties and identified 40 {Guinea (20 sps), Napier (15 sps) and Tree species (15)} of them are most suitable for cultivation considering the prevailing farming situations in Chittoor district. He not only works on cultivation of different species but also tested the palatability and yield improvement in milch animals. Such a farm holding large number of species is not found anywhere in the State and no way inferior to research farm of any University.

Sri.Madhava Reddy's farm is a source of planting material to farmers, research farms, and other private Dairy farms. With the support of Animal Husbandry Dept and ATMA, Chittoor he supplied seeds and slips to about 10000 families in the district in addition to neighbouring districts like Kadapa, East Godavari, West Godavari and Nizamabad. He also motivates the Dairy farmers to take up fodder production through training programmes, radio talks, TV Shows and news items. He is identified as the resource person and farmer facilitator by the State Department of Animal Husbandry. His farm is regularly visited by the farmers, officials and Veterinary students of the University.

4.5 Various extension efforts to popularize the technologies:

Extension activities are basic and proven methods, for attracting attention, arousing interest, leading farmers to have successful experiences with new ways and of doing things that are an improvement over the old practices. KVK has organized different extension activities to popularize the various new and latest technologies to the farming community, which includes field days, exhibitions, kisan melas, dissemination of technologies through radio, TV and news papers, conducted method demonstrations, published new technologies in the form pamphlets, folders, books etc., organized exposure visits to different agricultural institutes, research stations, progressive farmers fields etc. to update their knowledge.

S.No	Extension activity	Number
1	Field days	103
2	Exhibitions	42
3	Farmers fairs / Kisan melas	55
4	Radio talks	190
5	TV show	19

6	Film show	6
7	Method demonstrations	153
8	Exposure visits	15
9	News paper coverage	308
10	Articles published	68
11	Books/ Bulletins published	10
12	Literature developed (pamphlets, folders etc)	76
13	Video CDs	5

Joint Diagnostic visit with Scientists of ANGRAU

Joint Diagnostic visit with Department of Agriculture

Field day in Groundnut on the varieties released by BARC, Trombay

Field day in Paddy field transplanted by Paddy transplanter

Exposure visit to Gujarat to study mechanization in Groundnut

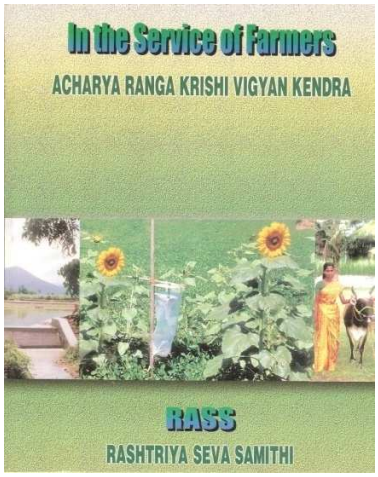
Smt G.Aruna Kumari, Hon'ble Minister for R&B, Govt. of A.P visited the exhibition stall

Method demonstration on preparation of poison bait for spodoptera management in Groundnut

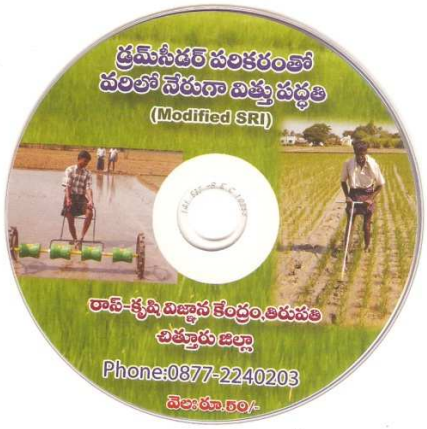
Demonstration on the efficacy of brush cutter in harvesting Paddy

Literature developed:

- 2000 copies of colour booklet on System of Rice Intensification
- 2000 copies of colour booklet on direct seeding in rice using 8-rowed drum seeder
- Pamphlets on different crop production technologies, IPM, INM, Vermicompost preparation, SRI, Direct seeding in rice, Management of Mango Nursery, Azolla as an alternate feed to milch animals, Sericulture etc.
- VCD's on SRI cultivation; Rejuvenation of Swarnamukhi river basin; Direct seeding in rice
- 9000 copies of colour booklet on Grameena Gruha Vaidyam
- 1000 copies of colour booklet on Sampoorna arogyaniki ausshadha mokkalato vantalu.

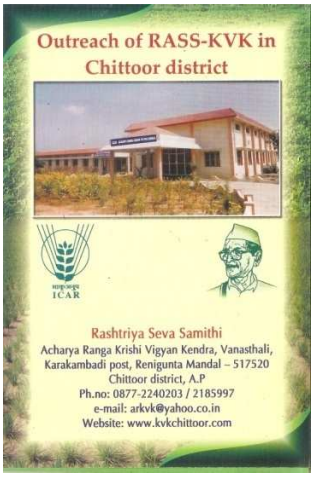


Souvenir released by KVK in 2000 on occasion of visit of Parlimentary standing committee on Agriculture



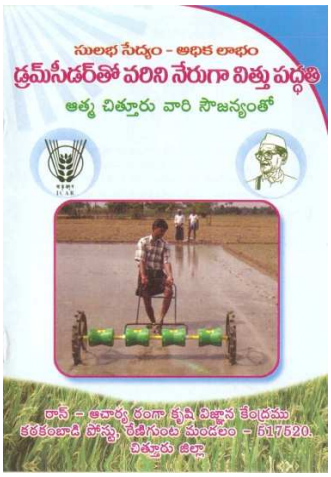
DVD on Direct seeding technology in ricereleased by Dr.P.Raghava Reddy, Vice Chancellor, ANGRAU

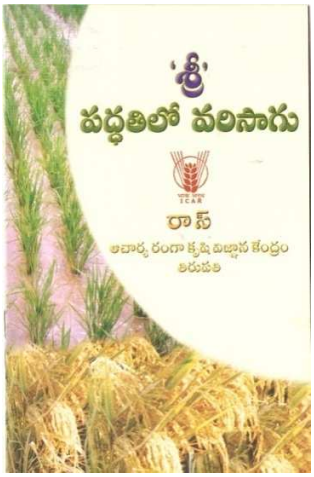
Souvenir released during Seventh National Workshop for KVK's & TTC's

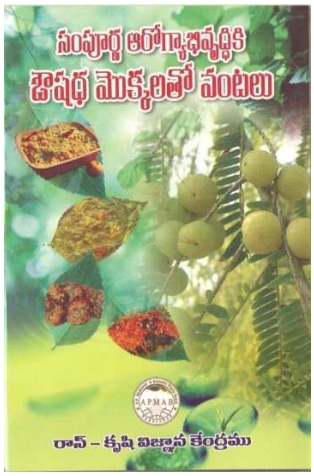


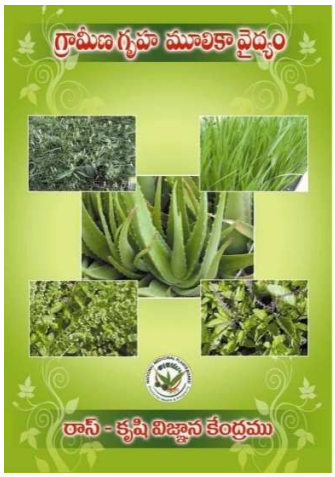
Profile of KVK released Annual Workshop of KVK's 2010 held at KVK, Nashik

Colour bulletins on different technologies published by RASS KVK









4.6 Production of seeds and seedlings:

Supply of quality of seeds and seedling materials to the farming community is one of the major activities of KVK. In addition to seeds produced at KVK farm, the seeds of major crops are also multiplied in the selected progressive farmers' fields under the supervision of KVK enabling wider adoption of the varieties. Groundnut is one of the major crops in Chittoor district and the latest varieties released by the ANGRAU & Babha Atomic Research Centre, Trombay were multiplied and supplied to farmers. Paddy and Red gram seeds were also multiplied and supplied to farmers.

KVK also produced quality grafts of Mango, Sweet Orange, Sapota and Guava for supplying to farmers and other organizations.

Under the project sponsored by National Medicinal Plants Board, New Delhi, KVK has supplied 90000 saplings of 10 different varieties of medicinal plants to 9000 families in Renigunta, Yerpedu, Ramachandrapuram and Chandragiri mandals of the district.

Consolidated statement of seeds and seedlings supplied by KVK since inception

Sl.no	Year	Seeds / Seedlings / Bio products	Quantity
1	1993	Groundnut (TPT-1 & TPT-2)	2.59 q
2	1994	Groundnut (JL-24, K-134 & TPT-2)	28.46 q
		Bajra (WCC-75)	7.44 q
		Sunflower	6.57 q
3	1995	Green gram (CG-261)	1.04 q
		Black gram (BPM-9)	0.99 q
		Groundnut (K-134, ICGV-44 & ICGV86031)	16.00 q
		Sunflower (MSHB-8)	10.0 q
		Redgram (LRG-30)	2.60 q
		Paddy (IR-60)	21.70 q
		Paddy (NLR-27999)	23.50 q
4	1996	Paddy (IET-1444)	48.75 q
		Paddy (IR-20)	64.5 q
		Groundnut (JL-24)	18.4 q
		Redgram (LRG-30)	4.9 q
		Mango grafts (Baneshan)	1000 no's
		Guava grafts (Allahabad safed)	650 no's
		Pome granate grafts (Ganesh)	570 no's
		Curry leaf seedlings	435 no's
5	1997	Crotons saplings	441 no's
		Teak saplings	450 no's
		Forest plants	2331 no's
		Moringa (PKM-1)	25 no's
		Groundnut (JL-24)	1.60 q
		Sunflower	1.0 q
		Mushroom spawn	2400 bottles
		Vermicompost	40.0 q
		Mango, Guava, Sapota &	14000 no's

		Pome granate grafts	
6	1998	Mango (Banglora) grafts	5000 no's
		Guava (Allahabad safed)	6000 no's
		Teak	100 no's
		Mushroom spawn	32 bottles
		Vermicompost	40.0 q
		Paddy (IR-36)	52.0 q
		Groundnut (JL-24)	30.0 q
7	1999	Groundnut (JL-24)	35.0 q
		Paddy (IR-36)	40.0 q
		Vermicompost	50.0 q
8	2000	Paddy (IR-36)	25.0 q
		Groundnut (JL-24)	15.0 q
		Vermicompost	35.0 q
		Mushroom spawn	65 bottles
9	2001	Paddy (IR-34) seeds	49 q
		Vermicompost	60 q
		Mushroom spawn	50 bottles
10	2002	Paddy (Tella Hamsa) seeds	14 q
		Vermicompost	60 q
		Mushroom spawn	50 bottles
11	2003	Groundnut (TCGS-29) seeds	32.8 q
		Groundnut (TAG-24)	120.0 q
		Groundnut (TPT-24)	180.0 q
		Redgram (LRG-41) seeds	1.0 q
		Vermicompost	30 q
12	2004	Groundnut (TPT-4)	115.0 q
		Groundnut (Narayani)	240.0 q
		Groundnut (TAG-24)	140.0 q
		Redgram (LRG-41)	1.0 q
		Paddy (BPT-5204)	21.0 q
13	2005	Paddy (ADT-37)	30.0 q
		Paddy (NDLR-8)	33.7 q
		Groundnut (Narayani)	450.0 q
		Groundnut (TAG-24)	220.0 q
		Groundnut (TPT-25)	95.0 q
		Groundnut (TPT-4)	100.0 q
		Redgram (LRG-41)	4.3 q
		Vermicompost	60.0 q
14	2006	Groundnut (TCGS-29)	485.0 q
		Groundnut (TAG-24)	375.0 q
		Groundnut (TIR-25)	90.0 q
		Paddy (NDLR-8)	8.25 q
		Vermicompost	40.0 q
		Medicinal plants saplings	1400 no's
		Aloe vera suckers	15000 no's

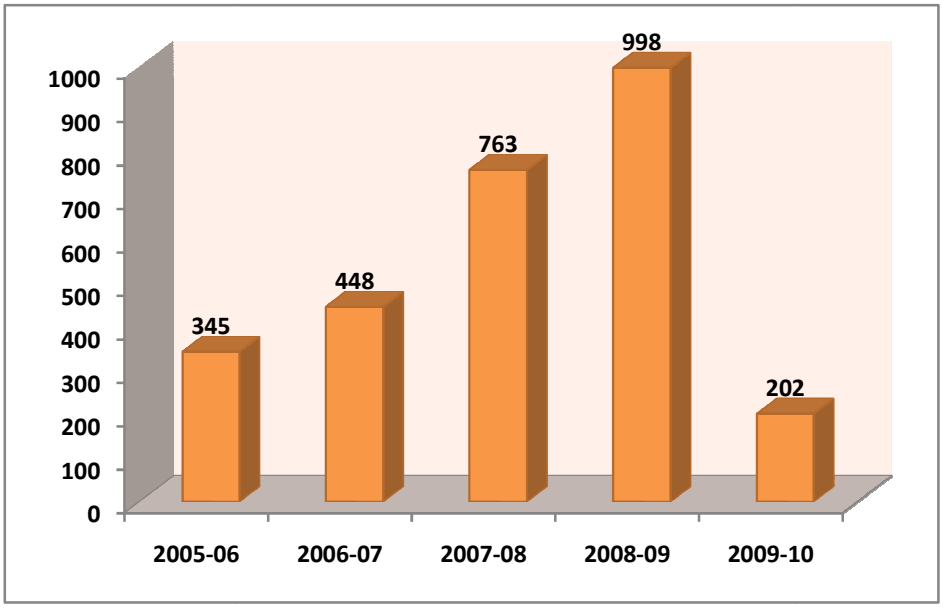
15	2007	Groundnut (TAG-24)	576.0 q
		Groundnut (TIR-25)	490.0 q
		Groundnut (TPT-23)	476.0 q
		Groundnut (TCGS-29)	60.0 q
		Groundnut (Greeshma)	256.0 q
		Aloe vera suckers	15000 no's
16	2008	Groundnut (TPT-25)	4.0 q
		Groundnut (TAG-24)	2101.0 q
		Groundnut (Greeshma)	345.0 q
		Groundnut (TG-37 A)	50.0 q
		Groundnut (Narayani)	230.0 q
		Redgram (LRG-41)	4.0 q
		Aloe vera suckers	15000 no's
		Sweet Orange grafts	50000 no's
		Medicinal plants saplings	30000 no's
		Vermicompost	70 q
		Azolla	2.0 q
17	2009	Aloe vera suckers	20000 no's
		Rangapur lime grafts	6000 no's
		Vermicompost	220 q
		Medicinal plants saplings	30000 no's
		Azolla	1.0 q
18	2010	Groundnut (TG-37A)	60.0 q
		Groundnut (Greeshma)	180.0 q
		Groundnut (TIR-9)	30.0 q
		Redgram (LRG-41)	15.0 q
		Redgram (TRG-22)	5.0 q
		Mango (Baneshan) grafts	6000 no's
		Mango (Banglora) grafts	6000 no's
		Mango (Neelam) grafts	1000 no's
		Mango (Khader) grafts	500 no's
		Sweet Orange grafts	5000 no's
		Medicinal plants	30000 no's
		Vermicompost	80.0 q

4.7 Soil health management:

RASSKVK is one of the 200 KVK's in the country to get Soil testing lab sanctioned by Indian Council of Agricultural Research. The lab was sanctioned during the year May 2005 and inaugurated by Dr.Raghuvansh Prasad Singh, Hon'ble Minister for Rural Development, Govt. of India. KVK is providing services of testing and analyzing the status of soil & water and administering the manure and fertilizer doses accordingly for the particular crop. This prevents the farmers from applying excessive or insufficient quantities of fertilizer doses which are not good either way for improving the productivity of the crops. Adopting soil

test based fertilizer application is not only reducing the cost of production but it also prevents deterioration and degradation of soil health.

Year wise soil samples analyzed in Soil testing lab of KVK



5 Collaborative programmes

5.1 Agricultural Technology Management Agency (ATMA)

RASSKVK is one of the participants in the exercise of preparing Strategic Research and Extension Plan of Chittoor district which is the base for implementation of ATMA. This strategic planning document guides the extension functionaries in their field programmes and also helps the ATMA realize the potential of development and consequently allocate funds.

RASSKVK is allotted SriKalahasthi block to conduct activities under ATMA and the Programme coordinator of KVK was given charge Officer-in-charge of the Block. KVK has been forefront in implementing innovative programmes like introduction of Maize as an alternate crop, Popularization of resource efficient rice production technologies like SRI method, Direct seeding in rice, introduction of latest varieties of Groundnut and multiplication of seeds, Mechanization in Paddy and Groundnut etc for the farming community with the financial resources of ATMA.

KVK has also conducted exposure visits to farmers to premier institutes in the Country like Indian Institute of Horticultural Research, Bangalore; Central Food Technology Research Institute, Mysore; Central Sericultural Research & Training Institute (CSRTI), Mysore; Jain Irrigations, Jalgaon; Rice research stations in Tamil Nadu etc.

KVK has conducted demonstrations of improved varieties, package of practices in farmer's fields etc and involved farmers through training programmes, field days and Scientist – Farmer interaction programmes.

Since inception of ATMA, KVK has tapped an amount of Rs.10, 00,000 for conducting various activities benefitting the farmers of the district.

Demonstrations conducted with the assistance of ATMA funds

Field day on Transplanting Paddy with Paddy Transplanter conducted under ATMA

5.2 National Bank for Agriculture and Rural Development (NABARD)

NABARD has supported KVK for infrastructural development in KVK campus like construction of Silkworm rearing unit, Silk reeling and twisting unit, a 30 bedded hostel for farmers etc with a budgetary sanction of Rs.12 lakhs. During 2010-11, NABARD has sanctioned two projects to KVK for promoting productivity enhancing sustainable agriculture in the district. About Rs.17.00 lakhs was sanctioned for popularizing Direct seeding in rice using drumseeder in the entire district by training programmes and conducting demonstrations. KVK has supplied critical inputs like drumseeders and conoweeders apart from pre-emergence weedicide for the beneficiaries.

Dr.R.Shreenath Reddy, AGM, NABARD, Chittoor visited the direct seeded rice plots

A pilot project for augmenting the productivity of lead crops in Chinnagottigallu mandal of Chittoor district was sanctioned to KVK with a budget outlay of Rs.53.00 lakhs. Paddy, Groundnut, Mango, Tomato and Dairy are the core areas focused in this project with the main objective of improving the productivity of these components and ensure sustainable livelihood security for the farming community. Cluster approach will be adopted in 11 Gram Panchayats of Chinnagottigallu mandal to achieve scale of economy and for having demonstrative effect. The

project aims at improving the overall socio – economic situation in the target areas through convergence of activities of Government and other agencies and provides missing inputs needed for enhancing the productivity.

5.3 Council for Advancement of People's Action and Rural Technology (CAPART)

RASS KVK has tapped funds from CAPART for development of Mushroom unit at KVK campus for conducting trainings cum demonstrations to rural youth enabling them to start up their own production units and generate income. Long duration on campus training programmes on spawn production, mushroom cultivation, preparation of nutritious recipes as well as marketing techniques are the training components while one day off campus programmes were conducted on the mushroom cultivation techniques only.

KVK has extended its services for soil and moisture conservation measures through watershed activities covering an area of 2128 ha in 66 villages of 7 mandals in the district with the financial support of CAPART. The funding agency has also supported KVK for conducting workshops on medicinal plants, Capacity building & Project formulation for NGO's etc.

Shri.Vijoy Kumar Rai, RR & MC, CAPART-RC, Hyderabad participated in the workshop organized by KVK on Capacity Building & Project formulation for NGO's

5.4 National Medicinal Plants Board (NMPB)

To mobilize and inculcate the use if indigenous medicine system among the rural folks, KVK is implementing a project titled "**Involvement Of Rural Households In Cultivation Of Medicinal Herbs For Primary Health Care And Training To Impart Value Addition, Processing And Cultivation With Income Generation For Self Sustainability"** with the financial support of National Medicinal and Aromatic Plants Board, New Delhi and the budget allotted is Rs.29.00 lakhs for a period of three years. Under this project, 9000 rural families will be supplied with 10 different varieties of medicinal plants to grow in their backyards and conduct awareness programmes and trainings on use of medicinal plants, preparation of raw drugs for small ailments, value addition etc. The

surplus herbal material produced by the families is procured by KVK on cost basis thereby providing additional sources of income to the family. The women were also trained on preparation of different culinaries with herbal plants thereby infusing the habit of taking herbs with medicinal values in their regular diet.

Awareness camps on primary health care with locally available herbal plants

Two day workshop on culinary preparation with medicinal plants

Central herbal nursery in KVK farm

Exhibition stall organized by KVK on medicinal plants & herbal products

5.5 National Horticulture Mission (NHM)

Chittoor district being a drought prone district, there is major shift in cultivation from regular Agricultural crops to Horticultural crops especially orchards. Hence the demand for genuine and quality planting material for mango and sweet orange is high and keeping this in view, KVK has tapped funds from NHM for establishing a small nursery of sweet orange with

a budget of Rs.3.00 lakhs. The root stock used for the grafts was Rangapur Lime as it is highly resistant to Tristeza and does well in heavy soils. Till now KVK has supplied 11000 grafts to farmers at the rates on par with Acharya N.G.Ranga Agricultural University.

5.6 Department of Women and Child Development (DWCD), Govt. of India

RASS KVK has established a bakery unit with the financial support of DWCD offering training to rural youth in baker y and confectionery. The participants were trained with hands of experience in preparation of nutritious biscuits, bread, different types of cakes, chocolates and other sugar confectionery items. Apart from training, a regular production of 1500 kgs of biscuits per month were being produced and supplied to 100 creche centres of RASS for its supplementary nutrition programme. This bakery unit was winded up during 1998-99 due to interrupted 3-phase power supply hindering the continuous running of the machinery.

The Department of Women and Child Development also initiated a sustainable women empowerment programme "Support to Training and Employment Programme" (STEP). The main emphasis of the programme was to identify, encourage, promote and strengthen gainful employment opportunities for economically disadvantaged women. This project involved household dairy activity – one which had several economical implications as a gainful income generating activity for rural women.

The geographical area of the project includes 70 villages in 4 mandals of Chittoor district. Project activities have been divided into 3 phases. as many as 2400 women, in each of the phases I and II, were covered and in the III phase, 6000 women were covered for promoting dairy as as income generating activity. In the IV phase of this programme covering the child labour families, the parents were encouraged to send their children to schools for education and sustainable livelihoods were provided 2000 families in Kuppam, Chittoor district.

RASS KVK extended its support in conducting training programmes to women on Dairy management, Clean milk production, fodder production, silage making, Azolla as an alternate feed etc.

Clean milking practices adopted by Smt Madhuri, one of the women beneficiary under the programme

Animal health camps organized in the tagetted villages

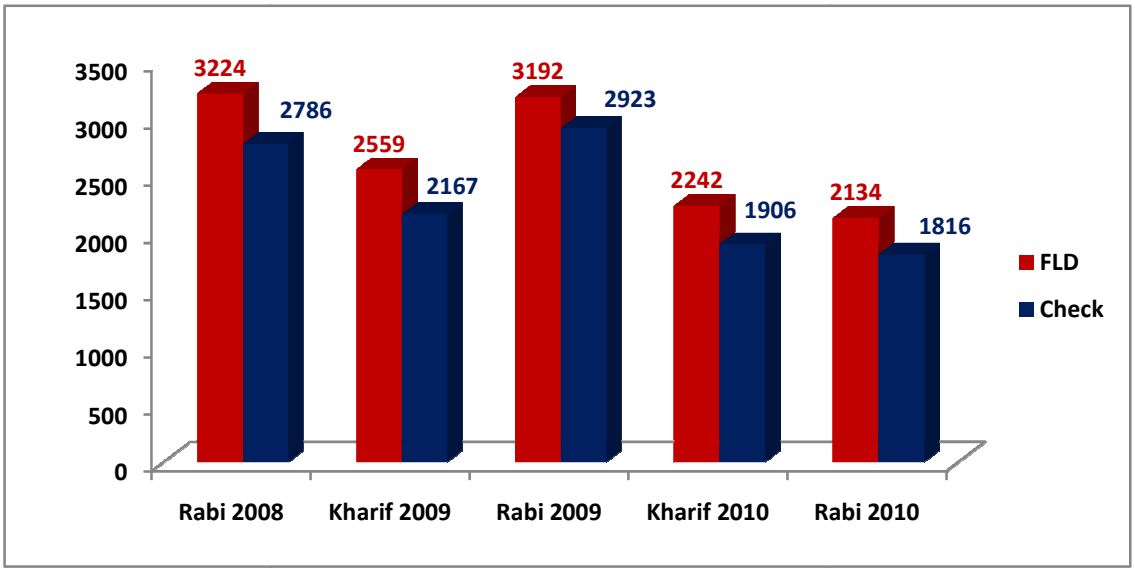
5.7 Directorate of Groundnut Research (DGR), Junagadh

Under Technology Mission on Oilseed crops, RASS KVK is conducting Front line demonstrations in Groundnut both varietal and whole package demonstrations in collaboration with Directorate of Groundnut research, Junagadh, Gujarat. The programme is initiated from Rabi 2008 and is continuing.

The FLD's conducted from Rabi 2008 to Rabi 2010 are as follows

Season	No. of FLD's conducted	Budget allotted (Rs)
Rabi 2008	50	100000
Kharif 2009	25	50000
Rabi 2009	40	80000
Kharif 2010	25	50000
Rabi 2010	20	40000

Average Productivity (Kg/ha) of Demonstrations & Check plots



5.8 Ministry of Food Processing Industries, Govt. of India

RASS KVK established a Food Processing Technology Training Centre (FPTC) in its campus with the financial support of Ministry of Food Processing Industries, Govt. of India. Since Mango and Tomato crops occupy majority of the area under Horticultural crops in the district and are prone to market fluctuations, KVK has initiated this FPTC with a budget of Rs.4.00 lakhs to train the rural women on different processing technologies and develop agri-entrepreneurship among them; to provide employment opportunities for rural women for their socio-economic upliftment; to get additional returns from the produce through value addition when there is a market glut for the produce etc.

Training programme on fruit processing for rural youth at Food processing unit of KVK

5.9 Drought Prone Area Programme (DPAP)

DPAP, Chittoor has sanctioned 12 watershed projects to RASS and KVK has played a major role in sensitizing the farmers on watershed concepts, introduction of technologies through demonstrations, Dissemination of information through print, audio visual aids including seminars, meetings, trainings, workshops, street plays etc., Effective use of Agricultural machines for the project in the initial in the farmers fields and in project areas, motivate them to adopt various soil and moisture conservation measures and to go for alternate cropping etc.

Check dam constructed under the Watershed programme

The impact of 12 watersheds at a glance:

Increase of agriculture productivity	-	15 to 20 %
Horticulture developed	-	20-30 Ha.
Improvement of fallow land	-	20-50 Ha benefited
Households benefited	-	900
Rise in the Ground water level	-	1-3 m
Social forestry developed	-	32000 Teak & Eucalyptus planted
Milk productivity	-	40-50 litres per day per village increased.

5.10 Rashtriya Mahila Kosh, SIDBI

RASS operates microfinance activities in all its development projects under the banner of RMP (Rashtriya Mahila Pragathi) through 3600 Self Help Groups in A.P and T.N for credit assistance by Rashtriya Mahila Kosh (RMK), Small Industries Bank of India (SIDBI), HDFC bank, UTI, Dhanalakshmi Bank and Andhra Bank. RASS KVK conducts training programmes to these groups on Home Management, Nutrition improvement, child care and immunization, income generating activities etc.

Self Help Group members participating in the monthly meeting to review their thrifts & credits

5.11 Fertilizer Association of India (FAI)

The Fertiliser Association of India (FAI), set up in 1955, is a national representative body of all fertiliser manufacturers in India comprising public, private, joint and cooperative sectors. To promote rational supply of fertilizers and manures for optimum supply of all essential nutrients for crop production, FAI is conducting demonstrations and field days on balanced fertilization with the technical support of KVK under the programme "Soil Health Enhancement Programme". This collaborative programme has begun in Kharif 2010 and is continuing successfully.

Sri Y.V.N Murthy, Regional Executive, FAI, Kolkata participated during the field day organized by KVK on soil test based fertilizer application

5.12 Line Departments

The Scientific team of RASS KVK conducts training programmes for the extension functionaries to update them with the emerging technologies on regular basis. The Scientists of KVK also participate in the departmental programmes as resource persons in training programmes, Farmers Field Schools and rythu sadassus. KVK also conducts field diagnostic visits jointly with the department officials and Scientists of University.

KVK Scientist participated as resource person in the Rythu Chaitanya Yatra, a programme of Agriculture Department

6 Impact of KVK interventions

6.1 Integrated Pest Management

Groundnut is grown in larger areas in Chittoor district as a major crop under rainfed conditions and a little extent under irrigation water from bore wells. Leaf miner / leaf webber is a serious pest attacking the crop during Kharif seasons every year which generally causes considerable damage to the crop and in some instances there was a severe damage of the crop foliage. Besides the crop was also suffering due to Tikka Leaf Spot Disease. Whenever a pest occurs in the field the usual practice adopted by the farmer is to give indiscriminate sprayings 3-4 times, even 4-6 times also with synthetic pyrethroids alone or in combination with other chemicals without observing the ETL of pest occurrence in the fields. Naturally more the chemicals we use to control the pests & insects, the more and quick resistance is being developed by the pests and insects to the chemicals.

Due to conducting of frequent training programmes, group discussions, seminars with ICRISAT Scientists by Dr. N.K. Sanghi, the then Zonal Co-ordinator, KVK Scientists have implemented Integrated Pest Management on leaf minor during Kharif 1994-95. During Kharif 1994-95, ARKVK has selected a village by name Padiredu in Vadamalapet mandal which is 25 kms away from KVK where leaf miner was the serious problem for the implementation of Integrated Pest Management programme with the guidance of Dr. N.K. Sanghi, Zonal Co-ordinator and Dr. G.V.Ranga Rao, Entomologist in ICRISAT.

Compact block of Groundnut crop during Kharif 1994-95

S. No.	Name of the village	Extent in ha	No. of farmers involved
1.	Padiredu	120	170

The pest was successfully controlled through the usage of Botanical Pesticides by regularly monitoring its ETL through installation of Pheromone traps. Since these demonstrations were done on a large block of about 120 ha involving 170 farmers, it had a good impact on the beneficiaries as well as in neighbouring

IPM demonstration plot at Munagalapalem village, Yerpedu mandal

villages. The false notions & beliefs of the farmers were completely erased and they started adopting the IPM technology.

Similarly ARKVK conducted demonstrations on management of Spodoptera with low pesticide usage in Rabi season in Eastern mandals of the district. The impact of IPM is clearly seen by low consumption of pesticides and increased usage of Botanicals on Groundnut.

6.2 Integrated Nutrient Management

Regular training programmes on importance of integrated nutrient management through soil health campaigns, demonstrations on soil test based fertilizer application in major crops and field days to show the results to other farmers motivated the farmers to reduce inorganic fertilizers and use adequate organic fertilizers.

Trial on Balanced fertilization in Paddy conducted in Kammakandriga village of R.C.Puram mandal

Smt K.Yuvarani holding 3 acres of land in Ramachandrapuram mandal says "I started using green manuring for all the crops like Paddy, Groundnut and Sugarcane. We have 2 oxen, 2 cows, 4 sheep and 10 no's of Chicks. The farm yard manure collected is applied as basal and thereby reduced use of inorganic fertilizers. When compared to my fellow farmers, we spend 50-60% less for fertilizers but the productivity levels in our fields are much higher".

Sri.Venu Gopal Chowdary a farmer from Munagalapalem village of Yerpedu mandal says "we generally believed that more the fertilizers used, more the yields would be, until KVK scientists conducted demonstrations on soil test based fertilizer application in Paddy. The demo plot gave same yield as that of the farmers' fields but the cost of production is reduced very much in demo plot".

6.3 Empowerment of Women

The main emphasis of Women empowerment had been to identify, encourage, promote and strengthen gainful self employment opportunities for economically disadvantaged women.

Household Dairy activity has several economic implications as a gainful income generating activity for rural women. Hence RASS has promoted Dairy activity through Support to Training and Employment Programme (STEP) of The Department of Women and Child Development,

Govt. of India to promote the level of awareness, skill and managerial ability required for the women to employ themselves gainfully in various fields. With coverage of 2400 women dairy farmers of Pichatur, Ramachandrapuram and Yerpedu mandals of Chittoor district, the STEP programme is the single biggest women empowerment programme of its kind in the state of Andhra Pradesh implemented by RASS.

Services

The following technical services and financial assistance are provided tot he beneficiaries

1. Calf rearing and feeding
2. Insurance coverage for the animals
3. Group saving and thrift programmes
4. Artificial insemination
5. Testing of milk for fat and other concentrates
6. Supply of information on the availability of crossbred animals
7. Formation of WDCs
8. Fodder development and establishing milk collection centres and market linkages
9. Distribution of RMK lower assistance to SHGs for relending among the women beneficiaries for purchase of milch animals.

Phase wise organized activities

S.No.	Activity	Phase I 1996 – 99	Phase II 1999 – 01	Phase III 2001 +	Cumulative
1.	SHG's formed	199	196	172	567
2.	No. of villages	33	39	-	72
3.	WDC's formed	26	24	-	50
4.	No. of beneficiaries	1206	1264	-	2470
5.	Milch animals purchased through loan scheme	981	680	410	1861
6.	Beneficiary themselves	1419	1930	713	4062
7.	No. of milch animals included	2400	2610	-	5010
8.	Veterinary care centres established	12	12	8	32

9.	Feed supplies	520	720	-	1240
10.	Individual fodder plots	804	1129	171	2104
11.	Community fodder plots	5	4	-	9
12.	Women trained as VVG	12	12	8	32
13.	Kitchen gardens raised by the beneficiary	152	176	52	385
14.	Women trained as AI and fat tester	12	12	8	32

Establishment of veterinary care centres

Instead of restricting the STEP activities to trainings, facilitating purchase of milch animals, milk collection and marketing, skill upgradation RASS – ARKVK went one step ahead and established 12 veterinary care centres with a qualified veterinary assistant surgeon. Village veterinary guide and artificial insemination worker at each center. Drugs and vaccines are provided free of cost and a nominal charge is made for artificial insemination.

Performance of artificial insemination in the project area

Phase	Year	AI done	AI positives	Calves born	Success rate %
I	1995-96	442	237	196	53.6
	1996-97	1125	565	492	50.3
	1997-98	1623	819	643	50.5
II	1998-99	920	512	460	55.6
	1999-00	1137	692	631	54.8
	2000-01	1314	711	642	54.2

Area under improved fodder cultivation 1995 to 2001

Year	Fodder plots developed		plots	Area under fodder cultivation (ac)
	Annuals	Perennials		
Phase I				
1995-96	108	72	180	13.9

1996-97	122	150	272	24.4
1997-98	160	210	370	32.7
Phase II				
1998-99	248	122	370	27.5
1999-00	289	253	542	32.5
2000-01	294	261	555	31.8

Smt K.Rathnamala of Munagalapalem village of Yerpedu mandal, a member of Self Help Group of RASS since 1989 and a Dairy entrepreneur owns three milch animals. She says that she owns a 2 acre land with bore well irrigation but her family financially sustained only through micro finance and Dairy activity only. We have established a Vermicompost unit producing Vermicompost and multiplication of earthworms through vermiculture with the technical and financial support of RASS KVK and are using the vermicompost to our own crops. The surplus vermicompost and earthworms are supplied to other farmers on cost basis. The milk in our villages is collected by one of our SHG member and the pooled milk is procured by Balaji CO-operative Society. From all the sources, the average annual income of my family is Rs.95000 – 1,00,000/-". My daughter has completed Engineering course and she is married to a Software engineer. Thanks to the interventions of RASS KVK in our village.

Smt K.Ratnamala taking care of her milch animals

6.4 Groundnut seed multiplication in seed villages

Good seed is the most essential input for a good crop. Only 10% of the quality seed of Groundnut varieties recommended by Acharya N.G.Ranga Agricultural University is being supplied by different agencies to the farming community. Though traditionally, seed was never seen as an external input, technological developments and followed market changes made the farmers dependent on external sources for seed. Groundnut is one of the major crops in Chittoor District and hence there is a great demand for seed. In crops like groundnut only 30% of total production can be used as seed for next season. Moreover, Monoculture using expensive inputs to maximize the production has resulted in static or reducing yields over the years. Small and marginal farmers who depend on rainfed agriculture cannot afford to buy seeds from the market because they do not have the

resources to procure them. Farmers are investing about 30 - 40% of the total cost of cultivation on seed alone. Purchasing seeds on credit is making them a debtor for all time. Hence, the concept of "own seed development" enables them to procure their own seed for next season and reduce cost of cultivation. The custom of taking seeds from the earlier crop enables them to apply their cultivation plan without having to resort to the market. Livelihood improvement of the target villages as a goal, Acharya Ranga Krishi Vigyan Kendra (ARKVK) Chittoor initiated "Seed village concept" since 2001 in two villages namely Gudimallam and Munagalapalem of Yerpedu mandal, Chittoor district. Improving the seed availability through distribution of high quality seeds of improved varieties released by research, capacity building of the community through training programmes, demonstrations etc and promotion of seed multiplication are the major activities proposed.

JL-24 was the predominant Groundnut variety cultivated by the farmers as they are aware of that variety alone and is supplied by the department of Agrl. on subsidy basis. The notion of the farmers was that the seed produced in their own fields doesn't give good yields if they reuse that seed and hence they bring seed from newer areas. They usually sell the Groundnut produce of their fields at middlemen's price of Rs. 600-650/bag of 40 kg pods. For the next season they start searching for seed in the district as well as in neighboring districts like Anantapur, Kadapa and in this process the procurement cost of the seed turns @ Rs. 800-850/bag of 40 kg pods. 300 kg of pods are required for one hectare field and in this process farmer is loosing an amount of Rs. 1500 - 1750 per hectare on primary input alone. Monoculture of JL-24, TMV-2 varieties for the past 10 years had resulted in declined/stable yields, but at the same time the cost of production is increasing resulting in poor net returns.

The cost of cultivation of Groundnut on an average is about Rs.21250 per ha while the gross returns are about Rs.39000 per ha leaving a net return of Rs.17750 per ha. The returns remained static or decreasing due to increased cost of cultivation especially increased seed cost, cost of fertilizers and pesticides.

Intervention of ARKVK

Gudimallam and Munagalapallem were identified and selected as adopted villages of ARKVK. Upon studying the farming situations and Agro-ecological resources in these villages ARKVK team decided to promote these two villages as seed villages.

Methodology followed:

A. Selection of Innovators and Early Adopters: Five farmers who were active and found knowledgeable during the participatory techniques and informal group discussions were identified from both the villages and selected for seed multiplication.

B. Training of farmers: Farmers were trained on basic Groundnut production skills, areas such as field selection, varietal selection, varietal purity, seed treatment, spacing, weed control, pest management, fertilizer doses, harvesting and post harvest handling. The Scientists of RARS Tirupati had participated as resource persons in transfer of technology programmes.

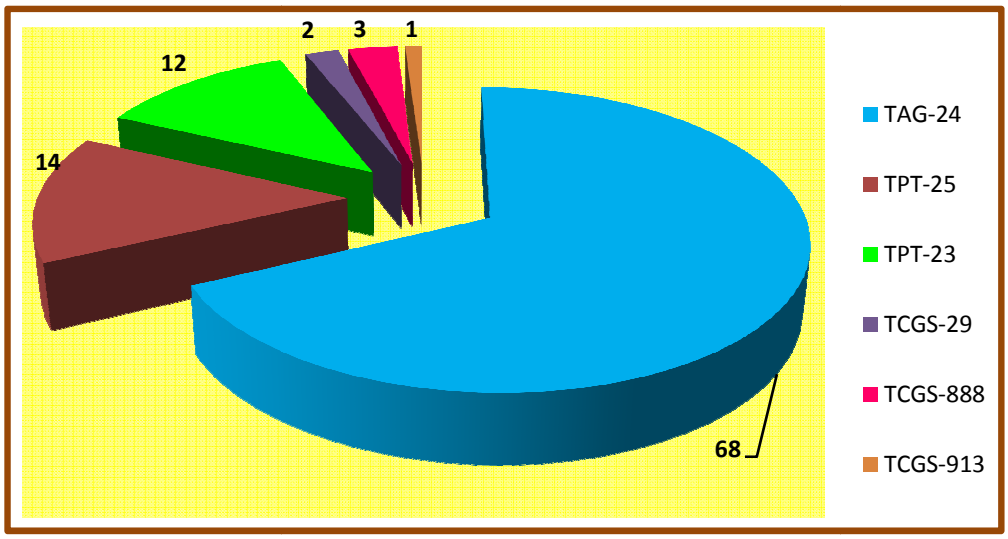
C. Supply of critical inputs: Identified farmers were supplied with latest varieties of groundnut like TPT-4, Narayani released by the RARS, Tirupati @ 80 Kg pods per farmer.

D. Demonstrations and field days: The demonstrations were set at strategic places (along main roads) where they could be exposed to many farmers. The farmers themselves managed these demonstrations under the regular monitoring and supervision of KVK scientists. Field days were then organized in each site to enable many farmers from the community to see the demonstration plots and check plots and this acted as one of the ways for disseminating the suitability and performance of new varieties to other farmers. The demonstration farmers explained the fellow farmers about the latest varieties and it also helped them to advertise the availability of seed of improved groundnut varieties.

E. Post harvest handling: The groundnut farmers of both these villages were given pre-season, mid-season and pre-harvest training on management of crop and produce. They were trained theoretically and practically on rouging practice, which is very important for maintaining the purity of seed. Post harvest techniques like hand picking of pods from the plants, shade drying, and treatment of the pods with chloropyriphos as a precautionary measure to stored pests, checking seed germination etc.

F. Use of own seed in the next season: After harvesting, these five farmers took all the measures for developing their produce as seed and they used their own seed in the next season. To their surprise they could reap good yields not less than their previous crop. This has convinced all the farming communities about the usage of own seed and it also improved the productivity.

Variety wise percentage of farmers in Groundnut seed villages during Kharif 2007

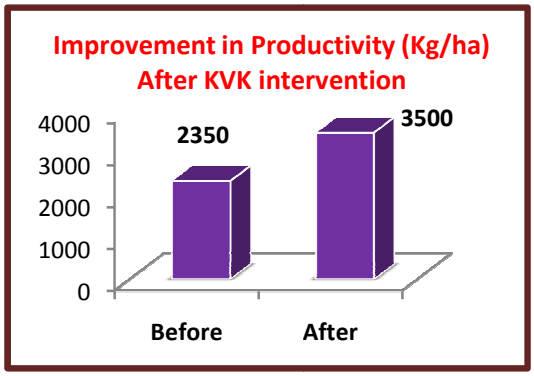


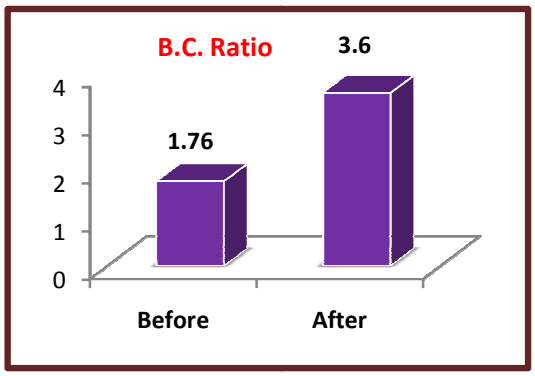
G. Mobilizing other farmers to take up new varieties: The fellow farmers were convinced with the improved yields of new varieties as well as own seed and confidently approached demonstration farmers for latest varieties. The seed produced from the demonstrations was supplied to 15 other identified farmers through FLD (oilseeds) programme in the next season and in this way the farmers were supplied new varieties for three years continuously. The seed from seed farmers was purchased by other fellow farmers paying Rs.100 extra over existing market rate. In the mean time the old five farmers were supplied with subsequently released new varieties like Narayani, TAG-24 and TPT-25 for multiplication of seed.

H. Supporting marketing initiative for the Seed produced: In the first year, KVK purchased the seed developed by the farmers at higher price about Rs.100 to Rs.200 over the existing market rate. KVK had done a large scale campaign about the availability of seed in these villages through News papers, radio and farmer meetings. Over the years the rate of 40 kg pods bag was sold at Rs.900-Rs.1000 by the seed farmers to organizations, Institutions etc. This motivated other farmers to develop seed as it is a better option to increase their net returns. Recently WTO cell of Commissionerate of Agriculture and APEDA, Hyderabad have come forward to facilitate export of aflatoxin free groundnut from this area. RASS, the host organization of KVK has donated its 3.5 acres of land for establishing a "Groundnut Technology Park" with provisions like processing equipment, aflatoxin testing lab, value addition centre and implements hiring centre. Thus the seed village concept gained its momentum and rapidly spread all over the district.

Impact of Seed village concept:

1. The peasants of both these villages are now cultivating groundnut for seed purpose only and they are using their own seed.





2. The farmers are well aware of and adopting the package of practices like seed treatment, seed rate, spacing, herbicidal weed management, soil test based fertilizer application, management of pest and diseases, post harvest handling of the produce etc.

3. A false belief "that seed produced in one's own field wouldn't give good yields" is left out and their mindset is changed as it is evident from own seed usage by the farmers for the past five years.

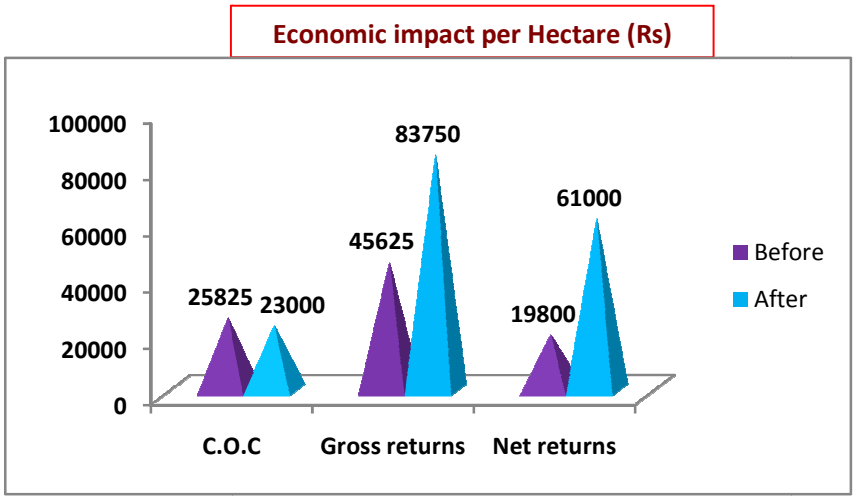
4. Farmers stopped going for subsidy seed supplied by the Department of Agriculture and also to other districts in search of seed.

5. The quantity of seed of latest varieties produced in the seed villages is as follows:

Sl.No	Year	Variety	Quantity (qtls)
1.	2007	TAG-24 TPT-25 TPT-23 Narayani TCGS-APNL-888	1876 490 476 160 256
2.	2006	Narayani TAG-24 TPT-25	485 375 240
3.	2005	Narayani TAG-24 TPT-25	450 220 95
4.	2004	Narayani TAG-24 TPT-4	240 140 107
5.	2003	Narayani TAG-24 TPT-4	30 120 180

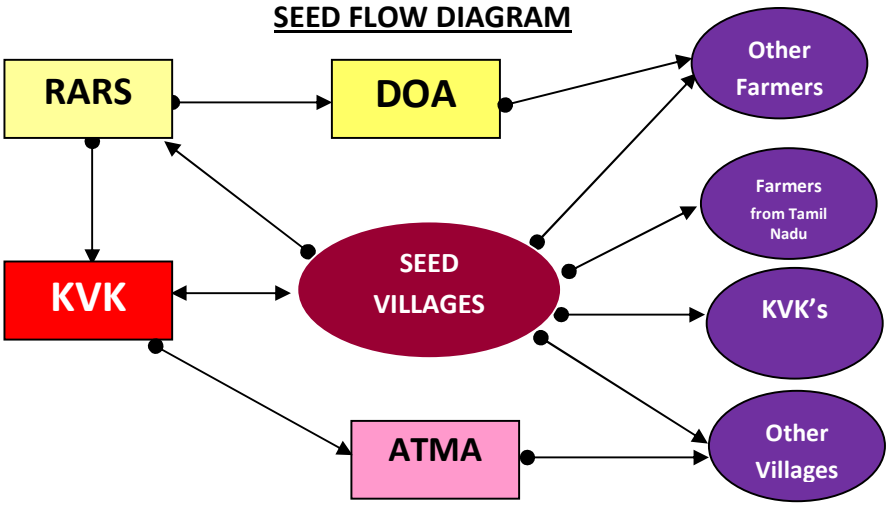
Socio economic impact:

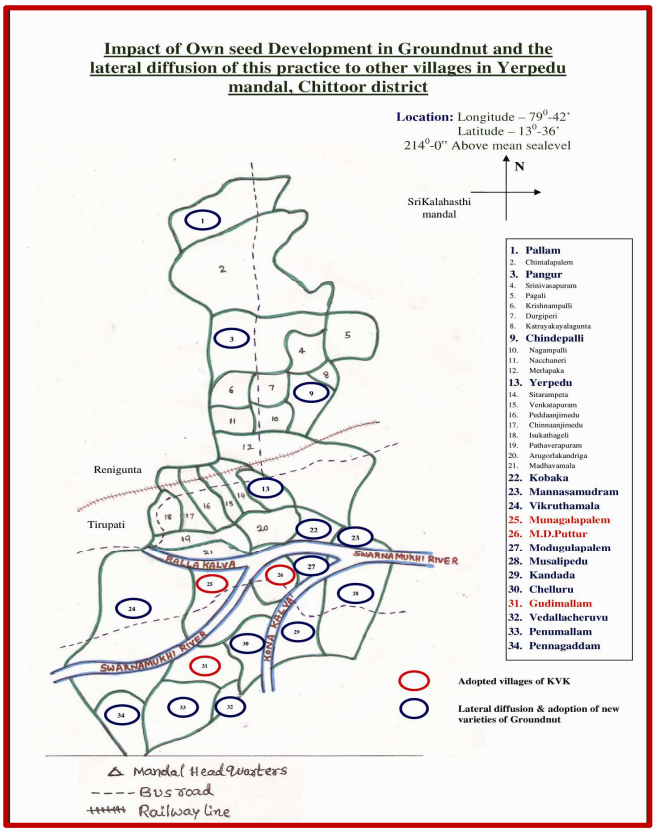
As per the latest available data, none of the farmers in these two villages as well as the farmers of surrounding 10 villages are taking up traditional varieties like JL-24 or TMV-2 but instead are cultivating one or the other new varieties introduced by KVK. It is not an exaggeration to say that none of these farmers stand in 'Q' in front of local mandal Agriculture office seeking subsidy groundnut seed. This is a successful achievement of the KVK and research team of RARS Tirupati who released suitable new varieties. Farmers who were once selling their produce @ Rs.600 –700 per bag of 40 kg pods are now selling their produce @ Rs.900-1200 per bag. The net returns were boomed up to Rs. 45000 per hectare on an average due to increased yields as well as the higher price for their produce. Farmers are very happy with the economic returns they got due to seed village concept.



The farmers have since become a source of quality seeds of the improved varieties and were able to supply seed to different stakeholders. The villages in and around these two villages were benefited by purchasing seeds locally instead of buying externally produced seeds, and transport and seed distribution costs were reduced. The high price for new varieties did not bother the buyers due to the reduction of above costs. The seed produced in these villages is being supplied not only to neighboring villagers but also to farmers of neighboring Tamil Nadu State. Seed required by KVK's Guntur, Banaganapalli, Karimnagar, Mahabubnagar for their FLD's is also supplied from these villages. RARS is also procuring seed from these villages and distributing it to farmers through Dept. of Agriculture. The Vice Chancellor of ANGRAU declared these villages as Seed villages for Groundnut in Chittoor district during his visit in these villages.

SEED FLOW DIAGRAM





The economic boom had led to social equity encouraging the thrift and credit activities of farm men as well as women.

Future prospective:

The future step is to export groundnut from this area to other states as well as other countries as the produce is clean, free from Aflatoxin with ensured quantity and quality. APEDA, Hyderabad and WTO cell of Commissionerate of Agriculture, Hyderabad have come forward to extend their support by establishing a Groundnut Technology Park in the heart of the mandal facilitating Processing, value addition and a lab to test Aflatoxin content.

Sri.S.Rajasekhar Naidu of Gudimallam village says "prior to step in of KVK into our village, we used sell the groundnut produce to middle men and for the next season, we procure the seed from other districts at higher prices or adjust with the seed supplied by the Agriculture department in subsidy. It took more than 2 years to believe the words of KVK staff about the own seed development and seed multiplication process. They convinced farmers of our village about these concepts through training programmes, demonstrations by giving inputs free of cost, exposure visits etc. Now to my knowledge, no farmer in our village goes for other areas for seed purpose and we are selling the surplus produce for seed purpose to other farmers of the district as well as other districts and even to neighbouring Tamil Nadu state. During the harvest season, nearly 5-6 truck loads of groundnut seed moves from our village to Tamil Nadu.

Dr.L.G.Giri Rao, Director of Extension, ANGRAU visited the Groundnut seed production plot of Sri S.Raja Sekhar Naidu

6.5 Resource efficient Rice production technologies

6.5.1 System Rice Intensification

System of Rice Intensification popularly called as "SRI" uses fewer inputs. It uses less seed, water, chemical fertilizers & pesticides but uses more organic manures. Rice grown with SRI technology has larger root volume, profuse and strong tillers with big panicles, more & well – filled spikelets with higher grain weight.

SRI technology is essentialy required for Chittoor district due to

- Ill and deficit rainfall
- Fast depletion of ground water

- Insufficient and interrupted power supply for irrigation
- Small holdings of majority of the farmers
- High cost of cultivation of Paddy in traditional method
- Low productivity of Paddy

Extension strategy adopted by ARKVK in disseminating the SRI technology in Chittoor District

On farm testing of SRI to assess the suitability of the technology to local conditions and refining it in coordination with scientists of State Agricultural University (ANGRAU).

↓

Training programmes / Rythu sadassus / group discussions to popularize the SRI practices to farmers as well as extension functionaries in the district and NGOs of Rayalaseema region (comprising of 4 districts)

↓

Exposure visits to areas where SRI Paddy is adopted

↓

Mass awareness through articles in Telugu news papers (25) and agricultural journal (Annadata), radio talks in FM radio, Tirupati station (5), publication of a colour booklet on SRI in Telugu language (2000 copies), pamphlets on SRI technology in Telugu language (1000 copies) live exhibits of SRI plants in kisan melas and exhibitions

↓

Promoting individual adopters (demonstration plots ranging from 0.5 acre to 5 acres)

↓

Group approach in the villages by sponsoring weeders and markers (community basis utilisation)

ARKVK believes that "**A successful farmer is the best advertisement**" and hence every care is taken in the selection of the farmer and his farming situation for conducting the demonstrations. If one demonstration fails in a village, it is very difficult to convince other farmers to take up this practice for the next season. Fortunately, ARKVK is able to maintain good relationship with the farmers as there is an increase of 4 to 56 % increment in the yields from SRI method over traditional practice in all the demonstration plots.

The demonstrations on SRI technology were conducted in about **120 acres in 8 mandals** of the district by KVK alone since 2003. Grain yields in all the **SRI plots** varied from **5250 kg/ha to 9187 kg/ha** where as

the yields in Paddy plots under **conventional cultivation** varied from **4687 kg/ha to 6470 kg/ha**. The **maximum yield (9187 kg/ha)** was obtained through the SRI cultivation with younger seedlings (8 to 12 days old), restricted irrigation, addition of organic manure, incorporation of weeds with soil aeration. Irrespective of the variety and the season, the average yield advantage of SRI cultivation over conventional system is approximately 1000 kg/ha in both Kharif and Rabi season. The percentage increase of Yields in SRI cultivation ranged from 4% to 56 %. This variation is observed due to the factors like incorporation of organic content in the soils, potentiality of the soil, timely weeding operations etc.

ARKVK is successful in promoting SRI technology. How?

- SRI is primarily popularized as water saving technology and an yield enhancing technology secondarily.
- Careful selection of the farmers. Interested adopters are encouraged. No farmer is insisted or forced to take up SRI practice.
- Small farmers who can afford family labour are motivated for SRI cultivation.
- Demonstrations are taken up in small area for the first timers which enable them to clearly understand the practices involved in the technology.
- Timely supply of conoweeders.
- Regular monitoring of the demonstration plots and timely suggestions.
- Reduction in the cost of cultivation while obtaining improved yields at the same time.

6.5.2 Direct Seeding in Rice

The transplanting of rice seedlings being a high labour-intensive and expensive operation needs to be substituted by direct seeding which could reduce labour needs by more than 20 per cent in terms of working hours. More over, SRI practice is not adequately adopted by the farmers' inspite of many advantages. National Rural Employment Guarantee Programme (NREGP) on the other side caused greater constraints in the availability of agricultural labour for regular farm operations. In this context, traditional transplanting or SRI which demand technically and energetically sound labour are found to be unviable and the farmers are in need of a suitable method which requires less human resources for paddy cultivation.

In this context KVK Chittoor endeavored direct seeding in rice with the help of a drum seeder in Madibaka village, Yerpedu mandal of Chittoor district during Rabi 2006.

Details of the direct seeding technology: **(Per acre)**

1. Seed rate required - 15 kg
2. Time required to direct seeding - 120 minutes

3. Labour required - 2 members [one for pulling drum seeder and the other to fill the seed in the drums].
4. Weedicide usage is a must and if needed (in fields where weed problem is high) 2nd application at 30 days after sowing is also done in addition to 1st application within 2 days after sowing.
5. Sprouted paddy seeds are filled to 3/4th of each of 4 drums and once pulled seed falls in 8 rows @ 20 cm width between rows.
6. Conoweeders of SRI are slightly modified to fit in the 20cm gap and they are run 3-4 times starting from 20 days after sowing.

The trial resulted in reduced usage of mandays for direct sowung, weeding etc and a significant improvement in yield attributes like number of effective tillers and grain yield. The farmers who conducted this trial and the rest of the farmers who closely observed it are very much convinced about this technology especially tiller development, yield potential and finally benefit cost aspects.

Spread of the direct seeding technology in Chittoor district of Andhra Pradesh

KVK introduced an 8-rowed paddy row seeder (also called Drum seeder) made of fibre from KSNM Marketing, Coimbatore during Rabi 2006. After success of the trial conducted in the field of Sri.Nageswara Rao, Madibaka village, Yerpedu mandal of Chittoor district KVK has further introduced five more drumseeders in the district during Kharif 2008. By Kharif 2009, 25 drumseeders were placed in different villages so that practicing farmers in that area use the machine free of cost. With financial support of ***Agricultural Technology Management Agency (ATMA)***, Chittoor KVK has purchased 15 drumseeders and placed one machine at each division of the Asst.Director of Agriculture's (ADA's) and totally 11 drumseeders in 11 ADA divisions. All the drumseeders are used by the farmers on community basis free of cost. NABARD has

KVK has modified the existing Conoweeder using for SRI method by reducing the width of wheels of 12.5 cm. Since the size of wheels of conoweeder are reduced, the drudgery involved in operating the conoweeder in the field is reduced very much. Of course this is one of the reasons for wide adoption of this technology by the farmers. During training programmes, KVK is not emphasizing the yield advantage of direct seeding method over traditional system but sensitizing them on the reduction in cost of labour and ease of cultivation.

The critical factors aided in gaining the confidence of the farmers are:

1. Direct seeding method avoids raising nursery, pulling it and transplanting it due to which labour requirement is negligible. Due to Employment Guarantee Scheme (EGS) for the rural unemployed labour offering Rs.80/day the demand for agricultural labour is at its peak forcing the farmers to pay high wages for regular field operations.

2. Farmers can take up Paddy cultivation any time instantly as there is no requirement of raising any nursery.

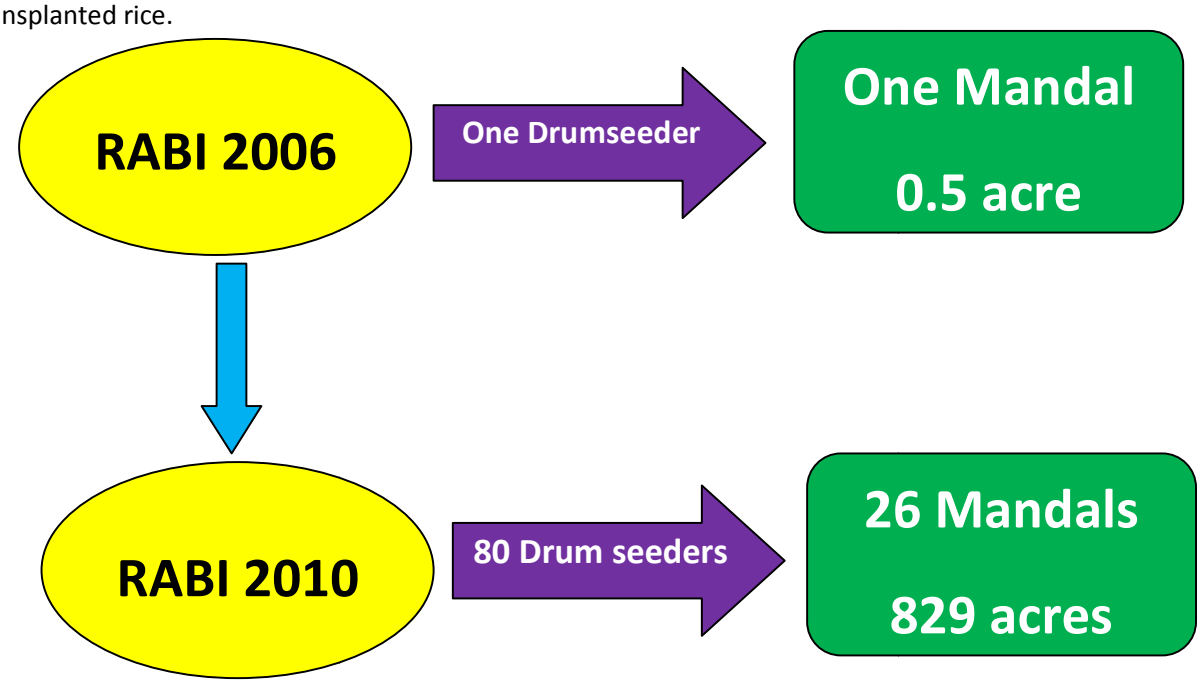
3. Paddy cultivation using direct seeding method can be taken up in fields with heavy weed infestation also because weedicide application is a must.

4. Labour requirement for running conoweeder is reduced to 50% compared to SRI methodology since it is run in one direction only. The major hurdle in adoption of SRI technology i.e., drudgery in conoweeder running is overcame in direct seeding method.

5. Farmers were of the opinion that they will be happy even if they recover normal yield with the drum seeding technology because they will save about Rs.1400 - 1500 per acre to be incurred on raising nursery and transplantation. Fortunately, in many of the demonstrations the yield is on par or more than that obtained in traditional system.

6. Operating the conoweeder (15cm width wheels) is easy compared to that used in SRI method (25 cm width).

7. Duration of the crop is also found to be reduced by 7-10 days compared to traditional practice. Wang and Sun (1990) noticed that duration was shortened by 7-15 days in direct seeded rice compared to transplanted rice.



Sri.K.Purushottam Naidu *of Mittur village of Ramachandrapuram mandal, a practitioner of direct seeding method was adjudged as the best rice farmer in the district for 2008 and awarded an amount of Rs.5000/- by the Honorable Minster of Andhra Pradesh State Smt.G.Aruna Kumari.*

6.6 Mechanization in major crops

Direct seeding in rice using an eight rowed drumseeder is a successful intervention of KVK widely adopted by small and marginal farmers of the district. This method is becoming increasingly attractive due to less requirement of labour and greater profitability compared to SRI and conventional methods. Benefit cost ratio by adopting this operation is 2.5.

Smt K.Yuvarani of Mittoor village adopted direct seeding in rice since three years

Transplanting of rice using paddy transplanter is another intervention of KVK introduced in the district in collaboration with ANGRAU and Department of Agriculture. After assessing the performance of the machine in 8 acres in Rabi 2008, three machines were purchased with the financial support of ATMA, Chittoor for the benefit of farmers. This method requires nursery preparation in a different way involving skill. Transplanting operation in one acre is completed in 2.5- 3.0 hours with just 2-3 labour while traditional manual planting is completed in 7-8 hours with 20 labour.

Sri G.Sudarshan Naidu of Kobaka village adopted paddy transplanter since 2009

Considering the inadequate and acute labour shortage for agricultural operations, KVK has introduced need based machinery in Groundnut. **Tractor drawn seed drill for sowing** groundnut and groundnut digger for harvesting the crop were purchased from Gujarat with the financial aid of APEDA, Hyderabad and demonstrated in the farmers' fields. Seed drill aided in timely sowing before the moisture in the soil is lost. Tractor drawn groundnut digger performed well if the stature of plants is small to medium height. The harvesting operation in acre is completed in about 1.5 to 2 hrs while in traditional method it takes 6-7hrs with a labour of 15 members. Thus both seed drill and digger are very efficient and effective in performing field operations and reducing labour component by about 50-60%.

Testing the efficacy of Groundnut ferti cum seed drill at Rangampet village

Demonstrating the performance of Groundnut digger for harvesting Groundnut crop

6.7 Productivity enhancement in Sericulture

Sericulture is another sustainable enterprise in the district and KVK has been in forefront in introducing low cost efficient technologies for the benefit of sericulture practitioners in the district. Technologies like V-1 Mulberry variety & spacing schedules, Chawkie rearing trays, Hydrodynamic incubators, Disinfectants and disinfection method of rearing rooms, rearing equipment etc., Wet and dry bulb thermometers, shoot rearing technologies, IPM for control of Uzi fly etc were popularized in the district.

Demonstrating the disinfection technology in Silkworm rearing rooms

With the adoption of location specific technologies administered by KVK, the productivity of Mulberry and cocoons is increased by 20-30%.

6.8 Natural Resource Management

6.8.1 WATERSHED DEVELOPMENT

RASS KVK has undertaken 12 watershed activities sanctioned by DPAP in soil and moisture conservation, water harvesting, improving percolation and recharge of ground water, improved vegetation, improved milk production, increased man days of work, creating more number of work days and finally all these interactions will improve the overall socio economic conditions of the watershed villages.

KVK has conducted training programmes and demonstrations on Integrated Pest Management, Integrated Nutrient Management, Vermicomposting etc to enhance the productivity of the crops in water shed areas. The KVK has a training centre on vermicompost and the farmers in watershed have been given intensive training in vermicompost preparation. Field demonstrations have been conducted on vermicompost preparation and usefulness to the crops. The farm women have appreciated that this value added programme has been very much beneficial in vegetable and floriculture programmes. The farmers have implemented vermicompost pits construction in their own lands for their agricultural crops.

Training programmes conducted on IPM, INM and Vermicompost, to the watershed area beneficiaries

S.No.	Name of the programme	No. of beneficiaries	No. of trg. Programmes per year
1.	Training programme on IPM and INM	396	18
2.	Training programme on vermiculture	368	16
3.	Training programme on microcredit harithalakshmi groups	138	6

HARITHALAKSHMI GROUPS

An effective system of sustainable SHGs, accessible to poor women Harithalakshmi groups are formed. Nearly 90 women groups are formed and the Revolving fund distributed to the beneficiaries for their income generating activities and the percent of work intended nearly 20 to 40 % of work spent through Harithalakshmi groups. So active involvement of women for the self sustainable activities in watershed areas.

Utilisation of technology was a function of many factors and it is the ultimate aim of any programme. The success of any programme depends on the effective utilisation of recommended technologies. The various personal, socio-economic and psychological characteristics of the beneficiaries may vary in the effective participation and utilisation of recommended technologies in WaterShed Development Programmes.

Performance Indicators

S. No	Indicator	Before	After
1	Crops	Rainfed Groundnut Rainfed Mango	Irrigated paddy and groundnut, Mango plantation, floriculture, vegetable cultivation
2	Varieties Groundnut and paddy	TMV2	JL – 24, TPT – 2; Disease and pest resistant Paddy varieties like Somasila, Pinakini, Tikkana, Swarna etc.
3	Yield / acre	G.nut - 800 kgs/acre Paddy - 1500 kgs/acre	G.nut - 1000 kgs/acre Paddy - 2000 kgs/acre
4	Alternative sources of energy	Forest wood, Acacia etc.	Bio gas, Smokeless chullah , LPG
5	Irrigation	Rain fed situation prevailing; Inadequate irrigation facilities	Irrigated crops; Supplementary irrigation for crops possible; Micro irrigation established in Fruit and floricultural crops
6	Water table	Decreased water level	Increased water levels in open and bore wells
7	Community based organisations	No CBO's	CBO's in the form of Haritha lakshmi groups, SHGs and user groups
8	Cropping area	Waste and barren lands are predominant	Waste and barren lands are put to use for Horticulture and social forestry
9	Soil erosion	Extensive crouching of soil, gully formness etc.	Gully plugging has been done, check dams arrested
10	Employment generation	High migration	Minimize migration through additional employment opportunities
11	Drinking water	Scarcity	Sufficient, protected water supply

Impact of watershed development programme

1. The impact of the natural conservation programme was clearly seen in better harvest of rain water, and then with low rainfall in to the water harvesting structures.
2. The construction of check dams has resulted recharge of the wells in ½ km of a distance.

3. The improvement of water table was monitored and it was observed that there was an increase of 1 to 3 meters in water table.
4. The availability of water has increased by 20 to 30 days duration facilitating irrigation to the crops, which otherwise might have suffered due to terminal stress causing a 10 to 15 % of yield loss.
5. The over all impact of the programme is increase and stabilization of irrigated area.
6. In many watersheds additional area of 50 to 75 acres was easily brought under irrigation.
7. This has increased the man days by 100 to 200. Similarly the milk production improved by at least 20 to 50 lts per day per village.
8. The crop production technologies are in production of improved varieties of groundnut and paddy. In groundnut high yield varieties, disease and pest control varieties have contributed 20 to 50 % increase in yield.
9. The average yield of paddy has gone up to 5000 kgs per ha. This is an increase of 400 to 500 kg per ha.
10. In groundnut there were serious pest and disease problems like spodoptera, nematodes, leaf spots etc., which were considerably reduced, due to series of awareness and training programmes conducted in the villages.
11. The consequence of the implementation of watershed and availability water and due to several training awareness programmes conducted, farmers are diversifying from rice and groundnut to vegetables cultivation and floriculture.
12. Irrigated fodder crops and permanent grasses like hybrid Napier grass are coupled with improved breeds and health programmes to animals have given substantial change in milk production especially in the drought areas.
13. Women farmers are very much benefited by this programme. The awareness creation has also resulted in diversification of land use to horticulture crops like Mango, bund planting of coconuts and considerable area of 25 to 30 ha.
14. The impact of social forestry is visible, as nearly 32000 plants of teak, eucalyptus etc were planted in the watershed areas.
15. The impact could have been much better if at least just normal rain fall was received in the last three years. There was continuous drought and there were no over flows.
16. But inspite of these area rain fall, the water table in wells could be maintained and large scale irrigation labour have been checked. The effect of watershed programmes will be more visible in years to come.

17. A future assessment of the impact will be done by the NGO and watershed communities under the auspicious of DPAP, which will throw more light on the large scale implementation of the programme.

6.8.2 SWARNAMUKHI RIVER REJUVENATION PROJECT

The river Swarnamukhi is one of the most important rivers in Chittoor district which joint Bay of Bengal after flowing through Nellore district, A.P. Though it is not perennial, it plays a great role in water table control, facilitating rain water infiltration and plays very important role in agriculture sector of Chittoor and Nellore districts. Apart from meeting irrigation needs it also helps in augmenting drinking water needs for nearly 400 habitations. Besides, the drinking water needs of temple towns like Tirupati and Srikalahasthi are met through Swarnamukhi river water.

Swarnamukhi flows for about 155 kms before joining Bay of Bengal near Kota village of Nellore district. It takes its birth near Sankampalli, Chittoor district. There are 9 main tributaries to Swarnamukhi. Its catchment area covers 9 mandals in Chittoor district, which is about 221614 ha, which includes reserve forest.

Sub-surface dam construction under Swarnamukhi River Rejuvenation

The river, over a period of time had dried up due to degradation of catchment area, over exploitation of groundwater, construction of Kalyani dam to augment drinking water needs, sand quarrying to near towns etc. Hence sub surface dam construction is the innovative, economically feasible approach to improve the ground water levels and recharge the wells and borewells in the nearby living areas.

The following interventions were taken.

- Catchment area treatment on the basis of watershed approach
- Construction of water harvesting structures at appropriate places.
- Construction of sub surface dams across the main river.
- Restoration and renovation of existing water harvesting structures.
- Capacity building to all stakeholders.

Implementation strategy

As many as 9 NGO's of Chittoor District are formed into consortium under the leadership of Rashtriya Seva Samithi (RASS) to take up Swarnamukhi river rejuvenation project with the financial support from CAPART in phased manner. The consortium has made its proposals to take up the project on integrated manner with a total outlay of Rs. 12 crores. Besides, the consortium has laid special focus for people's participation in all the developmental works.

Project Outcomes

- Intercept soil and water runoff
- Soil erosion controlled
- Increased the ground water availability
- Increased water for irrigation and drinking
- Rejuvenated dried up bore wells and open wells
- Increased products from common lands
- Increased area under cultivation
- Increased awareness on community ownership among the user groups
- Increased leadership qualities among Haritha lakshmi groups
- Increased the improved dairy, cattle and milk
- Increased yield of agricultural products
- Adoption of new varieties and new technologies
- There is a change in assets (wealth) ownership
- Increased access to employment

Major gains from the project

1. Augmentation of drinking and irrigation water in 400 habitations of Chittoor district
2. Augmentation of drinking water to important pilgrimage towns, Tirupati, Tirumala and Srikalahasti.
3. 10414 ha of degraded area is afforested.
4. Increase in bio-mass in 49411 ha of uncultivable area
5. Assured irrigation for 70799 ha of cultivable area and stabilization
6. Arresting distress and seasonal migration.

6.9 Indigenous Medicine for primary health care

RASS KVK is implementing a project titled "Involvement of rural house holds in cultivation of medicinal herbs for primary health care and training to impart value addition, processing and cultivation with income generation for self sustainability" in Chittoor district from the year 2008-09. The main objectives of the project are

Awareness camps on locally available herbal plants & their medicinal values

1. To raise nurseries of the proposed species of medicinal plants to supply required quantity of planting material.
2. To create awareness and educate the beneficiaries on propagation techniques, value addition and utilization techniques.
3. To impart training on home herbal remedies for primary health care.
4. To create awareness in raising of Nursery and cultivation of Medicinal Aromatic, dye yielding and Agro forestry plants.
5. To train people like SHGs, VSS, CMEY Groups, water shed committees, volunteers, NGOs, Farmers, Farmer clubs etc. in Nursery raising and cultivation of Medicinal, Aromatic, Dye yielding and Agro-forestry plants.
6. To train target groups in processing and marketing of value added products of medicinal and Aromatic plants
7. To facilitate for establishing the processing units and marketing arrangements.
8. To convey technical and support services to the farmers at field level for cultivation of Medicinal and Aromatic plants.
9. To explore utilization of available naturally growing plants and resources.
10. To encourage contract farming for the benefit of small and marginal farmers and farmer clubs.
11. To create employment and income generation for rural un-employed youth, small and marginal farmers for better standard of living.
12. To promote cultivation of medicinal and Aromatic plants for sustainable Agriculture and entrepreneurship and community development.

A beneficiary of Chaitanyapuram village maintaining herbal garden in her backyard

RASS KVK has established a big nursery of medicinal plants in its farm for supplying herbal plants to the identified 9000 families in 4 mandals of the district viz., Renigunta, Yerpedu, Ramachandrapuram and Chandragiri. Each family will raise 10 different herbal plants in their backyard and use them for primary health care without using any allopathic medicine. After creating awareness on the indigenous medicine system, the beneficiaries are given training on usage of medicinal plants for different ailments and value addition. The surplus plant/seed material after meeting the needs of the family is purchased by KVK at the fixed price thereby providing additional income to the families.

6.10 Horticulture

Chittoor is horticulturally important district with Mango, Tomato occupying majority area followed by a booming increase in Banana, Papaya and other crops. KVK has successfully indentified location specific technologies for issues like irregular flowering and bud drop in Mango, poor yields in Mango and Tomato, improper and insufficient fertility of soils etc. Some of the technologies that are popularized by KVK in the district are

- Soil fertility enhancement in Mango orchards by growing and trampling green manure crops
- Iimproving the flower set in mango by spraying KNo_3 and KH_2PO_4
- Enhancing the productivity of Banana by applying Banana special developed by IIHR, Bangalore
- Improving the size and quantity of fruits by adopting bunch feeding technique in Banana
- Increasing the efficiency of absorption of Phosphorous fertilizer by Banana plants and reduce root rot diseases through application of VAM
- Improving the productivity of flower crops like Jasmine and Rose by correcting micro-nutrient deficiencies etc.

Testing the efficacy of bunch feeding technology in Banana in Gundalkalva village of Renigunta mandal

Drip irrigation in Brinjal adopted by Sri Srikanth Reddy of Pedda Tippa Samudram mandal

In addition to development of location specific suitable technologies, KVK has established a Mango nursery in its farm to supply quality grafts of Baneshan and Banglora varieties. KVK is supplying plant material to farmers as well as to farmers under Watershed project.

6.11. 'WEALTH FROM WASTE' - VERMI COMPOST

Continuous use of chemical fertilizers over the years without caring for maintaining the soil balance has become counter productive. Agricultural scientists are getting concerned about the situation and suggesting to use bio-fertilizers and other organic manures in adequate quantities in order to maintain the soil balance. In the context, vermiculture and Vermicompost making is an important activity practiced in the ARKVK farm. Vermi culture unit was established which includes collection and multiplication of earthworms, installation of Vermicompost sheds, preparation of vermicompost and vermi wash. Training programmes are conducted on usage of vermicompost and vermi wash to floriculture and horticultural crops. The NPK content of vermicompost is 2.3; 1.0; 1.5 respectively. The organic carbon is ranging from 9.15 to 17.98 and also having micro nutrients like Sodium (Na), Calcium (Ca), Zinc (Zn,) Sulphur (S), Magnesium (Mg.) and Iron (Fe).

Knowing the importance of vermicompost in organic farming, ARKVK established 146 Vermicompost units in different villages of Yerpedu and Renigunta mandals with the financial support of CAPART. An amount of Rs. 5710 has been sanctioned per unit. Dynamic, enthusiastic farmers who have cattle in addition to farming were selected and one unit has been sanctioned to each farmer. Vermicompost pit construction was done under the guidance of ARKVK Scientific staff and the required earthworms were supplied by ARKVK. Farmers were trained on maintenance and usage of vermicompost by ARKVK staff. Vermicompost produced out from the pits is being used for their own crops by the majority of beneficiaries. After meeting their own needs, the surplus Vermicompost is sold to other farmers and orchard growers @ Rs 4/- per Kg. Some of the beneficiaries are also multiplying earthworms and selling them @ Rs 50/kg.

Sri Raghavulu Naidu of G.N. Kandriga village, Narayanavanam mandal maintains a Vermicompost unit and uses for his field crops

A case study - VERMICOMPOSTING-A BOON FOR MULBERRY GROWERS

Sustainable growth of Sericulture in necessitates continuous up gradation of existing technologies and developing new ones. Most crucial part is effective transfer of technology.

ARKVK while studying the villages identified that the cost of cultivation of Mulberry has tremendously increased over the years due to increased usage of inputs like inorganic fertilizers and

pesticides. Hence, ARKVK's intervention in the form of interactive lecturetts and demonstrations has enlightened the farmers about the implication of vermicomposting in Sericulture.

"The concept of using organic wastes including seriwaste for the preparation of Vermicompost and its application to Mulberry could be well adopted with ease and success" explains Sri N.Munikrishna Reddy, a progressive Sericulture beneficiary of ARKVK from Gangudupalli village of Chandragiri mandal of Chittoor district. The soil testing of selected fields revealed that the texture of the soil is sandy clay loam with P^H of 7.7, E.C 0.48, low organic Carbon, medium P_2O_5 and K_2O. ARKVK has conducted trials in five fields by replacing a part of the fertilizer recommendations of Central Silk Board with Vermicompost.

The farmers say that Sericulture has the potential of doing better and assuring some income even under distress conditions, where other crops may fail. In spite of irregular and insufficient rainfall in the district over the past 5 years and competitive market. They are cultivating V_1 variety of Mulberry for rearing C.B races and Swarnandhra. They take 5 crops in an year harvesting about 60-65 kg cocoon / 100dfls, on an average, after applying Vermicompost @ 2-2.5 ton/acre. A comparative account of production economics using vermicompost with that of normal package of practices adopted by their neighbours, highlights the increased returns of Rs. 580 per 100 dfls with vermicomposting. While narrating his experience with vermicomposting, Shri Munikrishna Reddy says he used bio-gas slurry, seri waste, weeds, poulty and goat faecal matter for preparing vermicompost and its usage not only improved the soil health but also the Mulberry yields and net returns. He said vermicomposting is a boon which also makes sericulture much sustainable.

It can be observed from the data presented in the following table that with the better quality of cocoon produced, the net returns per acre with the farmer adopting application of vermicompost were as high as Rs. 59800 per acre per year compared to commercial farming practices followed by the non demonstration farmer who could register a profit of Rs. 52900 only. As the same time, cocoon quality was superior in treatment receiving vermicompost and chemical inputs equally compared to that of total chemical input recording an increased returns of Rs. 1380 per 100 dfls with using vermicompost. However, the farmer can ensure higher profits by increasing the rearing capacity of his garden.

Comparative rearing performance and economics in farmers field (average of 5 acres)

Particulars	Vermicompost	Normal package of practices
Average acreage	1 acre	1 acre
No. of dfls reared	280	275
Actual yield per kg	160	155
Rate per kg (Rs.)	116	116

Total cost of Mulberry cultivation / acre /year	12000	16000
Total cost incurred in silkworm rearing	21000	21000
Total expenditure	33000	37000
Total returns / acre / year	92800	89900
Net returns / acre / year	59800	52900

Farmers felt that vermicompost is better alternative to conventionally prepared FYM. It is also worth while to mention that increased use of organic input in Mulberry reduced the pest and disease incidence by better build up of natural enemies. Thus the farmers are of conviction that there is an urgent need to utilise abundantly and naturally available vermicompost replacing chemical inputs like fertilizer and pesticides which may also help practicing an eco-friendly and sustainable sericulture.

7 Workshops & Seminars organized by KVK

Seventh National Workshop on KVK's / TTC's hosted by RASSKVK during 1995

RASS KVK hosted the Annual Zonal Workshop of KVK's of Zone V during 1997

A meeting of Parlimentary Standing Committee on Agriculture held at RASS KVK

Sri N.RaghuVeera Reddy, Hon'ble Minister for Agriculture addressing the gathering at Regional Conference on Sweet Orange hosted by RASS KVK

Dr.K.P.Vasuki, CEO, NMPB, Hyderabad addressing the trainees during the National workshop on herbal culinary

Shri.Vijoy Kumar Rai, RR & MC, CAPART-RC, Hyderabad addressing the NGO participants in the workshop organized by KVK on Capacity Building & Project formulation for NGO's

8 Visitors to RASS - KVK

Sri N.Raghu veera Reddy Hon'ble Minister of Agriculture visited KVK

Sri A.RamNarayan Reddy Ho'ble Minister of Information visited KVk stall

Sri Chakrapani, Chairman of Legislative Council, Govt of A.P visited KVK

Sri.N.Kiran Kumar Reddy, Chief Whip, Govt of A.P, visited KVK stall

Dr.M.S.Swaminathan & Sri M.Venkaiah Naidu visited KVK stall

Dr.P.Das, Deputy Director General, ICAR visited KVK

Sri.K.P.Srivasuki, CEO, A.P Medicinal & Aromatic Plants Board visited KVK

Dr.S.Raghuvardhan Reddy, Vice Chancellor, ANGRAU visited adopted villages of KVK

Smt.Ramalakshmi, Commissioner, Sericulture Department interacting with the staff of KVK

Veteran Indian Social activitst Shri Anna Hazare visited watershed areas of RASS-ARKVK

Dr.P.Gidda Reddy, Director of Extension, ANGRAU & Dr.Dattadri, Principal Scientist, ZPD for Zone V visited the demonstration plots of KVK

9 Recognitions

Sri S.Rajasekhar naidu, Best Groundnut farmer of the year 2006 awarded by Sri G.Surya Rao Hon'ble Minister for Animal Husbandry, Govt. of A.p

Smt G.Aruna Kumari Hon'ble Minister for Health education awarding Sri K.Purushottam Naidu as the best Paddy farmer of the year 2008 in Chittoor district

Sri Neelakanta Reddy, Best Sericulture farmer of the year 2008 awarded by Smt.G.Aruna Kumari, Hon'ble Minister for Health education & Smt G.Kutuhalamma, M.L.A Vepamjeri

Sri G.Sudarshan Naidu, Best Paddy farmer of the year 2009 in Chittoor district

10. Scientific Advisory Committee members

1. Dr.G.Muniratnam
   Chairman, RASS – Krishi Vigyan Kendra
2. Dr.P.Gidda Reddy
   Director of Extension, Acharya N.G.Ranga Agricultural University, Hyderabad
3. Dr.N.Sudhakar
   Zonal Project Director, ZPD for KVK's of Zone V
4. Dr.K.Raja Reddy
   Associate Director of Research, RARS, Tirupati
5. Joint Director of Agricultiure, Chittoor
6. Joint Director of Animal Husbandry, Chittoor
7. Asst. Director of Horticulture, Chittoor
8. Asst. Director of Soil Conservation
9. Joint Director of Sericulture, Chittoor
10. Asst. Director of Fisheries, Chittoor
11. The Chief Manager, Canara bank, Tirupati
12. Farm Radio Officer, AIR, Tirupati
13. Shri A.Radhapathi Naidu, Progressive farmer,
    Munagalapalem village, Yerpedu mandal, Chittoor dt
14. Shri R.Gopal Raju, Progressive farmer
    S.B.R Puram, Puttur
15. Smt.M.R.V.Santhamma, Women farmer
    Karvetinagaram
16. Smt K.Yuvarani, Women farmer
    Mittoor village, Ramachandrapuram mandal.
17. Coordinator, DAATTC, Chittoor
18. Programme Coordinator, RASS ARKVK

11.Staff members of RASS – Acharya Ranga Krishi Vigyan Kendra

Name of the staff	Designation
Shri C.Manohar	Programme Coordinator
Smt A.B.Srilatha	Subject Matter Specialist (Home Science)
Smt A.Padmaja	Subject Matter Specialist (Sericulture)
Shri S.Sreenivasulu	Subject Matter Specialist (Agronomy)
Shri P.Bala Hussain Reddy	Subject Matter Specialist (Agrl.Extension)
Shri V.Nagaraju	Office Superintendent
Shri S.Sreedhar	Junior Steno
Shri V Jayakumar	Watchman
Shri R Subramanyam	Peon-cum-messenger
Shri P Venugopal	Cook
Shri R Govindaswamy	Tractor driver
Shri T Vijaykumar	Driver-cum-mechanic

12Services provided by RASS KVK

- Analysis and interpretation of soil and water samples
- Diagnostic services
- Kisan mobile service – SMS on agricultural alerts, weather forecasts, pest and diseases, market prices etc
- Farm advisory services
- Supply quality seed material of latest varieties of Groundnut and Paddy, Sweet Orange grafts etc.
- Supply of farm implements and machinery