

## 32. SCIENTIFIC AND RESEARCH SERVICE

### 32.1 INSTITUTIONS AND LABORATORIES ENGAGED IN RESEARCH WORK 2015-16

#### 1. NATIONAL PULSES RESEARCH CENTRE, VAMBAN COLONY, PUDUKKOTTAI

##### About NPRC

National Pulses Research Centre under the control of Tamil Nadu Agricultural University was established in 1979 at Vamban in Pudukkottai district which lies in 11° 30' N latitude and longitude of 79° 26' E at 122 m above MSL. Total area of this centre is 106.80 hectares. It is situated 12 km away from the Pudukkottai in the Pudukkottai to Pattukottai state highways. This is the lead centre for research on pulses in the state and



main centre for All India Coordinated Research Programme (AICRP) on blackgram and greengram and subcentre for Pigeonpea. Since its inception, the centre has made significant progress in all the spheres of pulses research viz., release of high yielding pest and disease resistant varieties, to develop the improved cultivation technologies and integrated pest and disease management strategies for maximizing the pulse productivity.

##### Mandates

- To evolve high yielding, pest and diseases resistant/tolerant pulses varieties.
- To produce nucleus and breeder seed of pulses and groundnut for further multiplication.
- To evolve technologies for maximizing productivity by proper agronomic management practices in pulses.
- To identify suitable microbial strains and consortia for pulses agro ecosystem.
- To develop technologies for effective management of major insect pests and diseases of pulses.

## Research Activities

The following research activities are being taken up at NPRC, Vamban.

- Evolution of high yielding blackgram and greengram varieties resistant to Mungbean Yellow Mosaic Virus (MYMV) disease with synchronized maturity.
- Evolution of high yielding redgram genotype with pest and disease resistance.
- Evolution of dual purpose cowpea varieties with determinate plant type suitable for both grain and vegetable purpose.
- Weed management in blackgram, greengram and redgram.
- Development of Integrated crop management techniques in blackgram and greengram to maximize the grain yield.
- Evaluation of the performance of blackgram genotypes under maize intercropping system.
- Evaluation of suitable technology for maximizing seed yield and quality in Redgram.
- Evolving suitable *Rhizobium* strains for pulse crops viz., blackgram, greengram and redgram.
- Isolation and screening of acid tolerant *Rhizobium* strains for the acid soils of Tamil Nadu.
- Enhancing root nodulation in blackgram grown in acid soils using *Rhizobium* mutants and helper bacterium *Exiguobacterium* sp.
- Response of blackgram to phosphorous and bioresources in acidic soil
- Arbuscular Mycorrhizal mediated nodulation and nitrogen fixation in Red gram
- Developing efficient microbial consortia suitable for pulse agro-ecosystem.
- Impact of high temperature and moisture stress on photosynthesis, flowering and yield of blackgram genotypes
- Physiological and Biochemical evaluation of Blackgram *Vigna mungo* (L.) genotypes for drought tolerance
- Development of organic seed invigouration technique for enhancing various vigour status of blackgram seeds.
- Identification and screening of bruchid resistant varieties in blackgram.
- Bioecology studies on redgram pod fly, pod wasp and spotted pod borer.
- Identification of resistant sources for major diseases of redgram, greengram, blackgram and cowpea.
- Screening and evaluation of blackgram and greengram genotypes for drought and high temperature stress tolerance through physiological and biochemical studies.
- Evaluation of storage technology to increase the seed longevity potential
- Evaluation of newer insecticide molecules and microbial insecticides against the major insect pests of pulses.
- Identification of the potential newer insecticide molecule and botanical insecticide, azadirachtin in half the doses as a bio rational approach for managing pigeonpea pod insects.
- Development of eco-friendly IPM modules for major diseases of redgram, greengram and blackgram.

- Popularisation of recently released varieties with improved production technologies through Front Line Demonstration (FLD) in blackgram, green gram and redgram.
- Real time pest surveillance in redgram under National Initiative on Climate Resilient Agriculture (NICRA)

### **Variety released**

The Blackgram variety VBN 8 was released during January 2016 in the 46<sup>th</sup> State variety Release committee. Duration of this variety is 65-70 days. Average yield is 900 kg/ha which is 11.94 and 13.49% increase over VBN (Bg) 6 (804 kg/ha) and CO (Bg) 6 (793 kg/ha) respectively. The variety possess special advantages of synchronized maturity, multiple disease resistance against Mungbean Yellow Mosaic Virus (MYMV), Powdery mildew and leaf crinkle diseases with good battering quality.

### **Seed production**

#### **Nucleus seed production**

Nucleus seeds of high yielding pulses varieties are produced and distributed to all the research stations under TNAU for breeder seed production.

#### **Breeder seed production**

A total of 4650 kg of breeder seed of important pulse crops *viz.*, blackgram VBN (Bg) 4, VBN (Bg) 5, VBN (Bg) 6, VBN (Bg) 7, greengram VBN (Gg) 2, VBN (Gg) 3, redgram VBN (Rg) 2 , and VBN (Rg) 3 are produced in the Station and distributed to various State Seed Farms, Agricultural Extension Centres and private seed producers for the production of foundation and certified seeds.

#### **Truthfully labeled seed production**

A total of 2260 kg of TNAU Labelled seeds of blackgram VBN (Bg) 4, VBN (Bg) 5, VBN (Bg) 6, VBN (Bg) 8, greengram VBN (Gg) 2, VBN (Gg) 3 and redgram VBN (Rg) 2 , VBN (Rg) 3 are being produced in the Station and distributed to farmers, private seed producers and government agencies.

#### **NADP (RKVY) - Seed project on Promotion of quality seed production in green manure crops**

Under this project, 6 tonnes of quality seeds of green manure crop *viz.*, sunhemp var. CO 1 was produced and supplied to the farmers. Training on quality seed production techniques in green manure crops is also imparted to the farmers.

### **Biocontrol agents production**

A total of 330 kg of TNAU *Pseudomonas fluorescence* Pf1 and *Trichoderma* was produced and supplied to farmers.

### **Sale of Vegetable seed through Automated seed vending machine**

Installed one Automated seed vending machine at Collectorate complex, Pudukkottai on 17.03.2015 by Honorable Health Minister of Tamil Nadu. Vegetable seed of TNAU varieties are being distributed to the farmers through Automated Seed Vending Machine and 2600 packets of vegetable seeds were sold out to the farmers of Pudukkottai District.

### **Preparation of District Agricultural Plan**

Reports from Agriculture and line Departments were collected and District Agricultural Plan (DAP) for Pudukkottai district was prepared and submitted to the Director, CARDS, TNAU, Coimbatore-3 and the District Collector, Pudukkottai.

### **Extension Activities**

#### **List of Front line Demonstration trials conducted during 2015-16**

<b>S. No.</b>	<b>Crop/enterprise</b>	<b>Title of OFT</b>	<b>No. of trials conducted</b>
01	Blackgram	Seed production and yield maximization	25
02	Redgram	Seed production and yield maximization in pulses	10

#### **Trainings organized**

<b>S.No</b>	<b>Area of training</b>	<b>No. of courses</b>	<b>No. of Participants</b>		
			<b>Male</b>	<b>Female</b>	<b>Total</b>
01	Three days training on "Pulses production technologies" under SSEPERS-ATMA Scheme State level farmers' training	4	120	40	160
02	One day training on "Characters of pulses and Pulses production technologies" under Sarva Siksha Abiyan (SSA) Scheme	6	300	500	800
<b>Total</b>		<b>10</b>	<b>420</b>	<b>540</b>	<b>760</b>

## Meetings Organized

Preliminary meeting for preparation of District Agricultural Plan for Pudukottai district was conducted on 4<sup>th</sup> and 5<sup>th</sup> January 2016 at KVK, Vamban. District and block level officials, from Agriculture and other line departments and farmers from different blocks of Pudukottai district attended this meeting.

## Lectures delivered

S.No.	Topic of the Lecture	Name of the programme/Training	Beneficiaries
1.	Recent pulse varieties and their salient features	Cluster FLD pulses workshop cum training at AC&RI, Madurai	Farmers
2.	Seed production technique in pulses	Tirupputtur Rural Uplift Project Association (TRUPA), Sivagangai District	30 farmers
3.	Pulses production technologies	Precision Farm Producer Company Ltd Erode	50 farmers
4.	Seed village concept in pulses production technology	ATMA-seed village training programme	150 farmers
5.	Cashew varieties and its salient features	GOI sponsored three days training on cashew cultivation	200 farmers
6.	Harvesting, processing and post harvest management in cashew	GOI sponsored three days training on cashew cultivation	200 farmers
7.	Nutritional disorders and its management in cashew cultivation	GOI sponsored three days training on cashew cultivation	200 farmers
8.	<i>In situ</i> moisture conservation practices in Cashew cultivation	GOI sponsored three days training on cashew cultivation	150 farmers
9.	Role of Biofertilizers in pulses	Mount Zion School	100 students
10.	Sugarcane diseases and its management	SSI training	50 farmers

S.No.	Topic of the Lecture	Name of the programme/Training	Beneficiaries
11.	A lecture and demonstration on biocontrol mass production	Under ATMA scheme	120 members from Self help groups
12.	Integrated pest and diseases Management in agricultural crops	STAMIN, Kudimiyamalai	40 Assistant Agriculture Officers
13.	Importance of biofertilizers	STAMIN, Kudimiyamalai	40 Agriculture Officers
14.	IPM for vegetables	District horticultural information and training centre, Pudukkottai	Farmers
15.	Importance of pulses in India	Jamal Mohamad College, Trichy	Students

### Extension Programmes

Nature of Extension Programme	No. of Programmes
Field Day	2
Kisan Mela	5
Exhibition	6
News paper coverage	5
Radio talks	2
TV talks	2
Popular articles	7
Scientific visit to farmers field	20
Diagnostic visits	32
<b>Total</b>	<b>81</b>

**2. ICAR- KRISHI VIGYAN KENDRA, TAMIL NADU AGRICULTURAL UNIVERSITY,  
VAMBAN- 622 303, PUDUKKOTTAI**

The Krishi Vigyan Kendra, Vamban was started during 2000 under NATP at Vamban, Pudukkottai and established as ICAR KVK during 2004. It has an area of 23.2 ha in which, 3.05 ha under buildings and 2.31 ha under demo units and remaining 17.84 ha under crop cultivation and agro- forestry. The region of the KVK is lies on Centre of Tamil Nadu with having varied soil type of sandy, clay and sandy clay loam. The farming systems in the district viz., Irrigated agricultural, horticultural systems, Rainfed agricultural, horticultural and forestry systems and livestock production.

**Mandates**

- Application of technology / products through assessment, refinement, demonstration for adoption.

The following activities viz., On farm trail, Front line demonstration and trainings were carried out at Krishi Vigyan Kendra, Vamban during 2015-16.

**DETAILS OF TECHNOLOGY DEMONSTRATED IN THE FARMERS' FIELD**

Sl. No.	Title of Technology	Source of technology	Crop/enterprise	No. of programmes conducted
<b>ON FARM TRIALS</b>				
1	Assessment of weed management technologies in direct seeded rice	TNAU, DRR	Paddy	5
2	Assessment of alternative Rice variety for BPT 5204	TNAU	Paddy	5
3	Assessment on performance of Ragi varieties	TNAU, UAS Bangaluru	Ragi	5
4	Assessment of Maize hybrids	TNAU	Maize	5
5	Assessment of suitable groundnut varieties for drought tolerance	TNAU, ICRISAT	Groundnut	5
6	Assessment of disease management technique in groundnut	TNAU, DGR	Groundnut	5

7	Assessment of chillies hybrids suitable for Pudukkottai district	TNAU, IIHR	Chillies	5
<b>FRONT LINE DEMONSTRATIONS</b>				
8	Demonstration on IDM of neck blast in paddy	TNAU	Paddy	10
9	Demonstration on management of false smut disease in paddy	TNAU	Paddy	10
10	Demonstration on IDM of post flowering stalk rot disease in maize	TNAU	Maize	20
11	Demonstration of YMV resistant Blackgram VBN (Bg) 6	TNAU	Black gram	20
12	Demonstration of Tractor operated Pulse seeder in Blackgram	TNAU	Black gram	10
13	Demonstration of Synchronized maturity Green gram CO 8	TNAU	Green gram	15
14	Demonstration of pod borer management in black gram	TNAU	Black gram	15
15	Demonstration of capsule borer management in sesame	TNAU	Sesame	20
16	Demonstration of fodder crops Cumbu Napier Fodder sorghum Desmanthus Agathi	TNAU	Fodder crop	10
17	Demonstration of Arka Banana special MN formulations	IIHR	Banana	1
18	Demonstration of new tapioca variety Yethapur 1	TNAU	Tapioca	10
19	Demonstration of PLR1 Sirukeerai	TNAU	Sirukeerai	20
20	Demonstration of power mix T in turmeric	IIHR	Turmeric	10
21	Demonstration of foliar nutrition in cashew	TNAU	Cashew	10
22	Demonstration on management of collar rot disease in brinjal	TNAU	Brinjal	20
23	Demonstration of TNAU Milky mushroom CO (TG) 3	TNAU	Mushroom	1
24	Demonstration of nutritional garden in rural schools	TNAU	Nutrition garden	5



## TRAININGS CONDUCTED

### I. On campus Training programmes conducted to farmers and farm women

Area of training	Male		Female		Total
	SC/ST	Others	SC/ST	Others	
<b>1. Crop Production</b>					
Production technology on Pulses	3	4	-	12	19
Agro technique for Blackgram cultivation	-	2	1	16	19
Integrated Farming System	-	-	2	11	13
Seed production technology in pulses	0	5	0	3	8
Seed production technology in rice	3	5	-	12	20
Seed production technologies in green manure	1	5	2	23	31
SRI cultivation techniques	-	3	2	20	25
Agro techniques for small millet cultivation techniques	0	8	1	22	31
Direct seeded rice production technology	3	8	3	25	39
Ragi cultivation technologies	3	9	4	10	26
Groundnut seed production techniques	2	5	2	11	20
Seed testing demonstration in pulses	3	7	1	4	15
Biogas Technology	5	71	12	73	161

Area of training	Male		Female		Total
	SC/ST	Others	SC/ST	Others	
<b>2. Horticulture</b>					
Terrace gardening	1	14	10	36	61
Foliar application for increasing the female flower production in Gourds	2	5	1	7	15
ICM in Cucumber	1	6	0	20	27
Pruning techniques in cashew and Mango	2	13	-	-	15
<b>3. Home Science/Women empowerment</b>					
Value added products from Cashew apple	-	6	-	9	15
Value added products from pulses	-	-	-	11	11
Preparation of value added products in	0	0	11	9	20
Utilization of maize in daily diet	0	5	0	18	23
Value addition of millets	5	12	2	21	40
Utilization of green leafy vegetables in daily diet and value addition	0	6	0	22	28
Value addition of millets	2	29	2	7	40
Value addition of Pulses	-	-	-	-	40
<b>4. Plant Protection</b>					
IPM in coconut	1	2	1	11	15
Nematode management in Banana	-	2	-	5	7
Mushroom spawn production and milky mushroom cultivation	1	5	3	2	11

Area of training	Male		Female		Total
	SC/ST	Others	SC/ST	Others	
Mushroom spawn production and mushroom cultivation	1	3	5	2	11
Mushroom Cultivation	2	12	1	5	20
Red Palm weevil management in coconut	2	4	0	5	11
IPM in Paddy	2	3	3	5	13
Integrated disease management in vegetables	0	8	0	7	15
Disease management in pulses	3	7	6	14	30
Pseudomonas seed treatment in paddy	0	10	2	5	17
IPM in Pulses	3	8	4	10	25
Mushroom cultivation Technology	3	14	1	5	23
IDM in paddy	1	4	1	9	15
Mushroom cultivation technology	1	15	-	2	18
<b>Total</b>	<b>56</b>	<b>325</b>	<b>83</b>	<b>489</b>	<b>993</b>

## II. OFF CAMPUS TRAINING PROGRAMMES CONDUCTED TO FARMERS AND FARM WOMEN

Area of training	Male		Female		Total
	SC/ST	Others	SC/ST	Others	
<b>1. Crop Production</b>					
Seed production technology on Oilseeds	-	10	4	6	20
Demo on Laser leveling	3	15	2	5	25
Post harvest losses in vegetable crops in Vettanviduthi	6	15	8	11	40
Tractor operated Pulse seeder in Blackgram	-	-	-	-	28

Area of training	Male		Female		Total
	SC/ST	Others	SC/ST	Others	
Tractor operated seed drill sowing of Blackgram at kambankadu	0	25	0	2	27
Pulse cultivation techniques	5	28	2	8	43
Nutrient management in rice	3	11	-	5	19
<b>2. Home Science/Women empowerment</b>					
Value addition in minor millets	2	18	6	22	46
Importance of minor millet and their disease management					45
Value addition of minor millets	-	-	-	-	40
Value addition	-	-	-	-	100
Value addition of pulses in Thiruvarankulam	3	12	4	21	40
Value addition of vegetables in Thiruvarankulam	2	14	2	22	40
Value addition of coconut in Aranthangi	2	12	1	25	40
Value addition of coconut in Aranthangi	4	13	3	20	40
Value addition in pulses in Thiruvarankulam	1	20	4	15	40
Value addition in pulses in Illuppur	5	15	2	18	40
Value addition in pulses in Illuppur	3	16	0	21	40

Area of training	Male		Female		Total
	SC/ST	Others	SC/ST	Others	
<b>3. Plant Protection</b>					
IPM in paddy at Mettupatti	5	10	3	12	30
IPM in paddy at Kalkudi	4	18	2	6	30
IPM in Paddy	5	13	3	16	37
Bio-control agent production	-	-	4	16	20
Use of pheromone trap for insect pest management in pulses	0	22	0	4	26
Use of pheromone trap for insect pest management in pulses	2	14	3	9	28
Integrated Pest and disease management in pulses	6	24	3	7	40
<b>Total</b>	<b>61</b>	<b>325</b>	<b>56</b>	<b>271</b>	<b>924</b>

### III. On campus Training programmes conducted for Rural Youths

Area of training	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Edible mushroom cultivation technology	2	22	16	38	11	9	20	33	25	58
Preparation of millet based products	1	02	14	16	4	15	19	06	29	35
Vermi composting	2	33	21	54	1	0	1	34	21	55
Seed production in pulses	1	19	14	33	8	5	13	27	22	49
<b>Total</b>	<b>6</b>	<b>76</b>	<b>65</b>	<b>141</b>	<b>24</b>	<b>29</b>	<b>53</b>	<b>100</b>	<b>97</b>	<b>197</b>

#### IV. Off campus Training programmes conducted for Rural Youths

Area of training	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Mushroom cultivation	1	14	5	19	2	4	6	16	9	25
Seed treatment	1	6	12	18	2	3	5	8	15	23
<b>Total</b>	<b>2</b>	<b>20</b>	<b>17</b>	<b>37</b>	<b>4</b>	<b>7</b>	<b>11</b>	<b>24</b>	<b>24</b>	<b>48</b>

#### V. On campus Training programmes conducted for Extension functionaries

Area of training	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Latest techniques in crop production	2	52	38	90	34	12	46	86	50	136

## VI. Off campus Training programmes conducted for Extension functionaries

S.No.	Area of training	No. of Courses	No. of Participants								
			General			SC/ST			Grand Total		
			Male	Female	Total	Male	Female	Total	Male	Female	Total
1	Market-led Extension activities training	2	34	16	50	0	0	0	34	16	50

## VII. Sponsored training programmes conducted

Sl. No.	Sponsor and Title	No. of participants				
		Male		Female		Total
		SC/ST	Others	SC/ST	Others	
1	NADP sponsored training on Sustainable Sugarcane initiative	1	14	2	8	25
2	NADP sponsored training on Sustainable Sugarcane initiative	4	14	3	4	25
3	NADP sponsored training on Sustainable Sugarcane initiative	6	12	2	5	25
4	NADP sponsored training on Sustainable Sugarcane initiative	3	18	1	3	25
5	NADP sponsored training on Sustainable Sugarcane initiative	7	14	0	4	25
6	NADP sponsored training on Sustainable Sugarcane initiative	2	11	3	4	20

Sl. No.	Sponsor and Title	No. of participants				
		Male		Female		Total
		SC/ST	Others	SC/ST	Others	
7	GOI- DCCD sponsored training on Cashew cultivation Techniques	1	28	7	14	50
8	GOI- DCCD sponsored training on Cashew cultivation Techniques	6	36	1	7	50

### VIII. Extension Programmes

Nature of Extension Programme	No. of Programmes	No. of Participants (General)			No. of Participants SC / ST			No. of extension personnel		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Field Day	15	302	266	568	117	128	245	17	19	36
Kisan Mela	3	728	349	1077	321	178	499	48	37	85
Exhibition	7	1630	432	2062	563	268	831	36	45	81
Film Show	6	243	189	432	187	108	295	23	12	35
Method Demonstrations	61	348	298	646	256	214	470	27	36	63
Farmers Seminar	3	234	105	339	213	115	328	7	12	19
Workshop	3	128	69	197	278	289	567	0	0	0
Group meetings	72	654	388	1042	0	0	0	0	0	0
Lectures delivered as resource persons	265	844	523	1367	678	432	1110	1765	474	2238



Newspaper coverage	94	0	0	0	0	0	0	0	0	0
Radio talks	4	0	0	0	0	0	0	0	0	0
TV talks	4	0	0	0	0	0	0	0	0	0
Popular articles	17	0	0	0	0	0	0	0	0	0
Extension Literature	19	0	0	0	0	0	0	0	0	0
Advisory Services	678	186	213	399	124	89	213	124	146	270
Scientific visit to farmers field	176	0	0	0	0	0	0	0	0	0
Farmers visit to KVK	0	568	765	1333	678	987	1665	0	0	0
Diagnostic visits	98	0	0	0	0	0	0	0	0	0
Exposure visits	5	48	32	80	45	25	70	0	0	0
Soil health Camp	12	432	256	688	234	316	550	0	0	0
Animal Health Camp	0	0	0	0	0	0	0	0	0	0
Agri mobile clinic	0	0	0	0	0	0	0	0	0	0
Soil test campaigns	2	124	48	172	185	69	254	0	0	0
Farm Science Club Conveners meet	6	134	138	272	46	39	85	0	0	0
Self Help Group Conveners meetings	3	38	26	64	12	8	20	0	0	0
Celebration of important days	6	165	64	229	137	39	176	28	32	64
<b>Total</b>	<b>1559</b>	<b>6806</b>	<b>4161</b>	<b>10967</b>	<b>4074</b>	<b>3304</b>	<b>7378</b>	<b>2075</b>	<b>813</b>	<b>2891</b>

More importantly, irrigation has four phases. In phase-I, Sowing Period Irrigation needs to be ensured. The phase-II Stress the need for irrigation for Crop Life Period, the third phase emphasizes the significance of irrigation for Flowering and the last, but not the least stage, insists irrigation for Grain Filling. Invariably, these four stages are not at all fulfilled over years, that led to adverse scenario in the attributes of certain principal crops.

