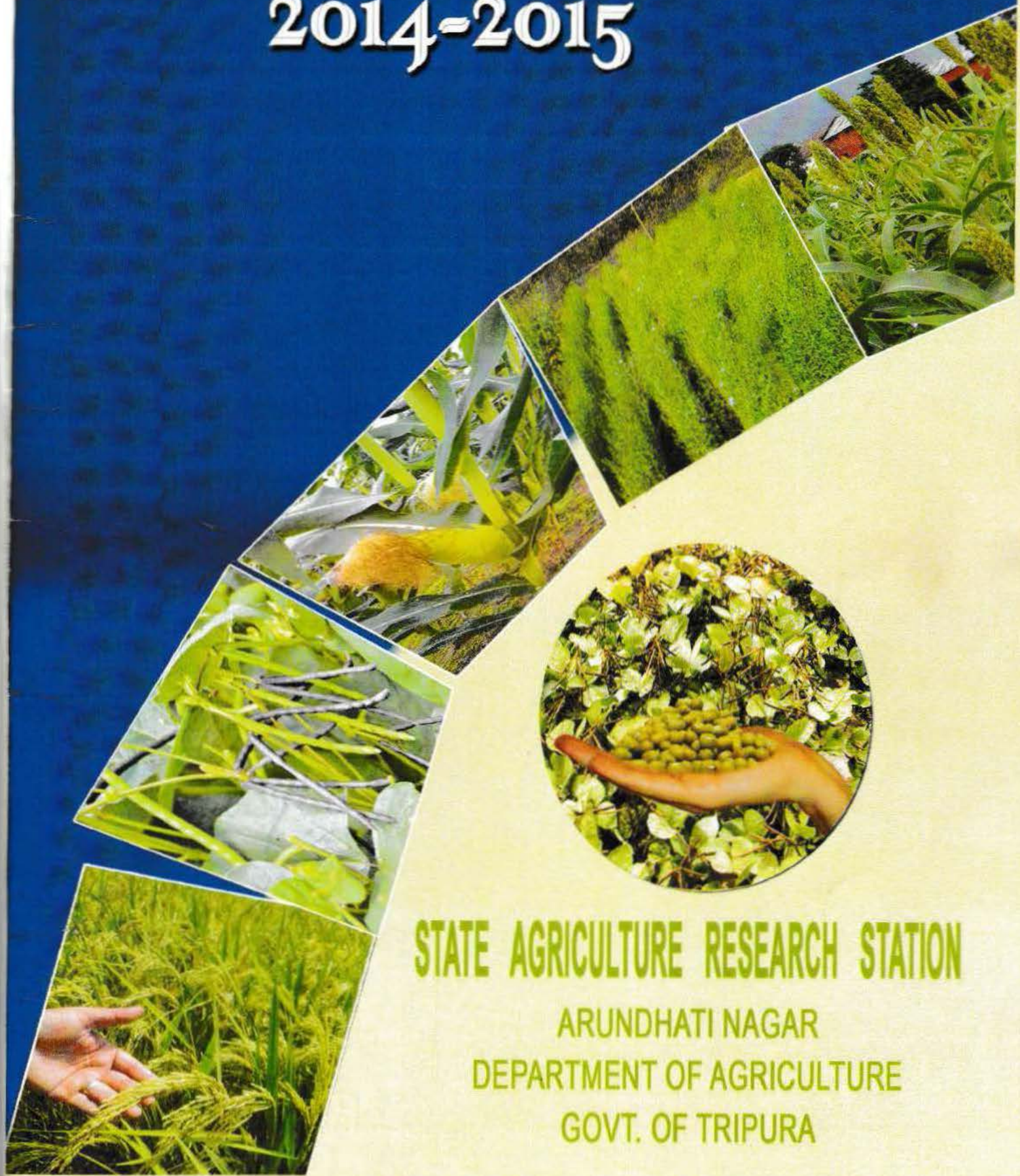


ANNUAL REPORT

2014-2015



STATE AGRICULTURE RESEARCH STATION

ARUNDHATI NAGAR

DEPARTMENT OF AGRICULTURE

GOVT. OF TRIPURA

Preface

Economy of the State is primarily agrarian. Agriculture is the state's dominant sector with a contribution of nearly 23% to the Net State Domestic Product (NSDP). According to 2001 census, about 52 % of total work force is engaged in agriculture, out of which farmers constitute about 28% and agricultural labourers constitute roughly 24%. Small and marginal farmers constitute almost 96% of the total farming community in the state. The net sown area is only about 27% of the state's geographical area as 73% of the land is of hilly terrain and the rest are plain land suitable for crop cultivation.

The state enjoys more or less an equitable climate. As the hilly areas are not very high, there is little variation in climate in various parts of the state. The average maximum temperature, minimum temperature, rainfall and humidity of Tripura from the observations of past few years was calculated to be around 34° C, 10° C, 2150 mm and 81.5% respectively. These climatic factors hold immense opportunity for the cultivation of a large variety of crops.

Prior to the accession of the Princely state with Indian Union, agriculture in the region was of subsistence nature as the adoption of modern technology in crop cultivation was very low and the population pressure on the land vis-a-vis demand for food grain was less. The partition of India was a defining event in the history of this region and totally destabilized the economic and social structure of the state. The demand for food raised to insurmountable proportion with no immediate revival in sight the situation turned from desperate to despair.

The region richly endowed with genetic diversity of plants, was subjected to indiscriminate human interference by adoption of unscientific land use system. With rapid increase in human and livestock population and the rising demand of food, feed, fuel, fodder, fibre, timber and the other developmental activities, the rural masses had been forced to exploit forestland and water resources at sub-optimal level in complete defiance of the inherent potential. This resulted in progressive decrease in forest cover, loss of biodiversity, serious soil erosion leading to depletion of plant nutrients, gradual degradation and decline in land productivity and its carrying capacity, silting of major river basin causing recurrent floods in the plains, and drying up of perennial streams as well as ecological imbalances. The impending catastrophic consequences prompted the administration to realize that to raise the production of existing crops, intensive research efforts are required so as to identify suitable varieties of existing crops, employ newer technologies and at the same time ensure the human resource development.

With this intent the State Agriculture Research Station (Erstwhile Research-Cum-Demonstration Farm) Department of Agriculture, Government of Tripura was established in the year 1961 at Arundhatinagar. The research station is located at 22° 52' E latitude and 91° 10' N longitude having elevation of 12.6 m with sandy loam soil and pH range of 5.1 to 5.5. Adaptive research is the mandate of the State Agriculture Research Station. This station endeavors to keep pace with the new frontiers of crop improvements and contemporary developments those are socially and technically relevant to the States Agriculture Policy. Since its establishment, the centre has made significant contribution towards the rice research and development & has become a voluntary centre of All India Coordinated Rice Improvement Programme. The main objective of the station is to disseminate the modern technology among the farming community of Tripura by carrying out research works. The Research Units of this establishment namely Agronomy, Plant Breeding and Pest Management conducts basic adaptive research on different aspects of Crop Management, Crop Improvement and Crop Protection.

Besides this State Soil Testing Laboratory and State Seed Testing laboratory is also providing different Agro Advisory Services to the farmers of Tripura. The Station has also to its credit State Bio-fertilizer Production Centre, State Pesticide Testing Laboratory and State Bio-Control Production Centre which are significantly contributing to the Agriculture in a sustainable approach.

Despite the fact that the average land holding of the state is about 0.97 hac, Agriculture in the state, during the last two decades has made rapid strides towards attaining self-sufficiency in food grain production due to the introduction and adoption of modern technology through extensive trials compounded with the enhancement of human resource development. It is commendable to note that agricultural research as well as extension has helped to increase the productivity level. However, now agriculture is facing new challenges. The growth in the sector has more or less shows sign of stagnation which is affecting the morale of the farming class. This has led to the large scale migration of the rural masses, specially the youths, towards other profession which makes agriculture an occupation of elderly people living in rural areas. To attract enterprising youths to take up farming as profitable occupation and to reverse the out-migration, innovative strategy such as commercialization of agriculture and adoption of improved methods are the new challenges to be addressed by both researchers & planners. Apart from this, the dwindling resources of soil, water, flora, fauna and increasing concern for environmental safety are also of prime importance & to be addressed to evolve suitable agro-techniques, develop an integrated pest and nutrient management system and at the same time develop an appropriate soil and water management techniques.

Agricultural research along with technological improvements, in the state, is and will continue to be prerequisites for increasing agricultural productivity and generating income for farmers and the rural work force. This in turn will help to alleviate poverty, which is primarily a rural phenomenon, but which also afflicts the urban poor.

Prioritization of Agricultural Research in the state along with the organizational structure and functional role has evolved over a period of time to match the emerging demands. However, it is now being increasingly felt that there is urgent need to bring about changes that will enhance our ability and capacity to deal with emerging challenges in a more efficient and effective manner. It is evident that optimal use of available human, infrastructure and financial resources will become increasingly important. Amongst other steps, better priority setting and sharper targeting of demand based research is to be worked out to make the system effective. The system is now faced with the task of not only increasing the productivity of selected new crops but also to address issues such as increasing disparity in agricultural growth, maintaining and enhancing the quality of natural resource base and reducing environmental degradation, poverty alleviation etc. Thanking you.

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AGRONOMY DIVISION



ALL INDIA CO-ORDINATED TRIALS PROGRAMME CONDUCTED DURING 2014-15.

State Agriculture Research Station is the notified co-ordinated research station of Directorate of Rice research (DRR), ICAR Hyderabad since 1986. The main objectives are multi-location evaluation of improved cultures, crop management practices, protection technologies and their popularization through FLD's across diverse eco systems to identify situation specific technologies & stabilizing rice production in the Country for past so many years. The State Agriculture Research Station, Arundhatinagar is one of the co-ordinated centers where the following experimental trials have been conducted in Kharif & Rabi season During-2014-15.

(A) KHARIF-2014-15.

1) Evaluation of intercropping system with different nutrient management practices in rainfed upland rice.



Trial was conducted to optimize system productivity of Rain fed rice by intercropping with legumes and nutrient management during Kharif 2014 in split plot design with three replications. Treatments consisting of five nutrient management practices {(N¹: 75% recommended dose of fertilizers (RDF) of rice, N²:100% RDF of rice, N³: 75% RDF of rice+ 20 kg sulphar/ha; N⁴: 100% RDF of rice +20 kg sulphar/ha and N⁵:75% RDF +5 t/ha FYM or 2 t/ha Vermi compost)} in main plot and five cropping systems (C¹: rice

alone ;C²: rice + Moong 3:2 replacement series; C³: rice + cowpea 3:2 replacement series;C⁴: rice + moong 4:2 replacement series and C⁵:rice + cowpea 4:2 replacement series) as sub plot were assessed for their productivity performance in Rainfed regions and the result revealed that, intercropping of rice + cowpea (3:2 or 4:2 replacement series) resulted in higher rice equivalent yields and gross returns.

Title of the Trial	:	Evaluation of intercropping system with different nutrient management practices in rain fed upland rice(Direct seeded rice)
Location	:	Tilla-9
No of entries/design/treatment	:	Design:- SPD, Treatment:- Main plot- Nitrogen management practices Sub plot- intercropping Replication -03
Crop/Variety	:	Paddy-TRC-2013-12, Pulses-Cowpea-Kashi kanchan.
Date of Sowing	:	07-06-2014
Date of Harvesting	:	Cowpea harvesting started on 10-08-2014 & completed by 15-08-2014,Paddy-02-09-2014
Observation	:	The production of paddy and cowpea received from the plot of pulses intercrop with paddy under C ₃ (Rice + Cowpea 3:2 replacement series with N ₄ (100% RFD + 20 kg sulphar/ ha) application is higher in comparison to other treatments. The Gross return from Rice and Pulses is 12% higher than that of rice mono crop and 8-16% higher than that of other series with different nutrient management.

2) Effect of nitrogen scheduling and dosage in aerobic rice.

The trial was conducted during kharif 2014 to assess the efficiency of N scheduling and dosage under aerobic condition and also for effective evaluation of the N application to aerobic rice. The treatments included, doses of nitrogen {80(100%) and 100 kg/ha (125% of recommended dose)} as main plots with six schedules of N {two splits($\frac{1}{2}$ Basal + $\frac{1}{2}$ PI stage; 10-12 DAE + $\frac{1}{2}$ PI Stage), three splits (1/3 Basal + 1/3 AT + 1/3 PI stage: 1/3 10-12 DAE + 1/3 AT + 1/3 PI stage;), four splits ($\frac{1}{4}$ Basal + $\frac{1}{4}$ at PI stage + $\frac{1}{4}$ at AT stage + $\frac{1}{4}$ at flowering; $\frac{1}{4}$ 10-12 DAE + $\frac{1}{4}$ AT stage + $\frac{1}{4}$ at PI stage + $\frac{1}{4}$ at flowering)) as sub-plots



it was concluded that nitrogen dose of 100% recommendation is sufficient to meet the nitrogen demand, Among the nitrogen schedules, three split applications with 1/3 as basal + 1/3 AT + 1/3 PI stage is required to achieve higher grain yields.

Title of the Trial	:	Effect of nitrogen scheduling and dosages on aerobic Rice (DSR)
Location	:	T-8 (Plot size- 12 sq.m)
No of entries/design/treatment	:	Design:- Split plot design Treatment: Main plot -2 nos. Recommended fertilizer/ dosage(100% & 125%). Sub-plot -06nos Nitrogen scheduling. Replication -03 nos. Total plots-36.

Crop/Variety	:	Paddy-Sahabhagi Dhan
Date of Sowing	:	03-05-2014
Date of Harvesting	:	25-08-2014
Observation	:	The production received from 3 splits of 'N' application through 100 % RDF (1/3 basal, 1/3 AT & 1/3 PI stage) is 10-15% higher than other split doses and 8-12% higher than 125% of RDF under different split doses of 'N'.

3) Long term effects of nutrient on SRI vis-a-vis conventional flooded rice on soil fertility and sustainability in rice based cropping systems.



A study was initiated during kharif-2012 was continued during 2014. The treatments were combination of three methods of crop establishment SRI, Direct seeding using drum seeder/ dibbling of sprouted seed at 25 × 25 cm fb principles (Saturation method of water management, weeding with cono-weeder and fertilizer management) and normal transplanting (30-35 days old 3-4 seedling/hill planted at 20 cm× 15 cm spacing with flooding [2-5 cm] water management as main plot

and seven nutrient management practices (F¹-100% of recommended dose of inorganic fertilizers i.e. RDF(80:40:40) kg N:P:K/ha), F²-50% inorganic +50% (equivalent of N dose) organic, F³ RDF through organic source (equivalent of N dose), F⁴-150% RDF, F⁵-No fertilizer (Control), F⁶-50% inorganic +50% through bio fertilizers and F⁷- Location specific fertilizers management in sub plots. The evaluation of crop establishment method along with different nutrient combinations clearly indicate superiority of SRI method (9-12 % higher grain yield) over direct seeded followed by SRI principles & normal transplanting.

Among the methods of nutrient management treatments 150% RFD recorded significantly higher grain yield (7.10 t/ha) and the performance of treatment (50% organic + 50% inorganic) found significantly superior (6.77 t/ha) to rest of the treatment (5.40 t/ha).

Title of the Trial	:	Long term effect of nutrient of SRI vis-a-vis conventional flooded rice on soil fertility and sustainability in rice based cropping system.
Location	:	L-9(B) (Plot size- 7 sq.m
No of entries/ design/ treatment	:	Design:- Split plot design Treatment: Main plot -03 methods of crop establishment (SRI,DSR & normal transplanting) Sub plot-07 Nutrient Management practices. Replication-03 nos. Total plots-63 nos.
Crop/Variety	:	MTU-7029
Date of Sowing	:	Nursery bed on -12-07-2014 for SRI & Conventional and DSR in the main field.
Date of Transplanting	:	SRI-25-07-2014, & Conventional on 06.08.2014.
Date of Harvesting	:	SRI-20-11-2014, Direct seeded-25-11-2014 Conventional-27-11-2014.

Observation : No. of tillers per sq.mtr under SRI system in (50% organic & 50% inorganic) & S⁴(150% RDF) are 20% & 18.8% respectively higher in comparison to traditional system & 12% & 10.5 % respectively higher in comparison to direct seeding system. Whereas yield received 13.6% & 16.5 % respectively higher in comparison to traditional system & 8.75% & 9.20% respectively higher in comparison to direct seeding system.

4) Yield maximization of rice through site specific nutrient management.



In the first year of study on yield maximization of rice through site specific nutrient management using computer based decision tool for nutrient recommendations, developed by International Plant Nutrient Institute(IPNI), the application of N P K based on nutrient expert(NE) tool resulted in significantly higher grain yield(by 7-13%) over the Recommended Fertilizer Dose(80:40:40). Further evaluation of Nutrient Expert is needed to fine tune

the decision support tool for nutrient recommendations in Rice.

Title of the Trial : **Yield maximization of rice through site specific nutrient management.**

Location : L-9(A)

No of entries/design/treatment : Design:- RBD
Treatment: 8 nos.
Replication-03 nos.
Total plots-24 nos.

Crop/Variety : Gomati.

Date of Sowing : Nursery bed on -19-07-2014

Date of Transplanting : 08.08.2014

Date of Harvesting : 20.12.2014.

Observation : The no. of tillers per sq.m in the vigour applied plots are 15.8% higher than the plots under recommended doses of Fertilizer, at the same time yield also received higher i.e. 10.43% more.

5) Evaluation of promising varieties and hybrids for their suitability in Direct seeded rice.

With the objective of identifying the location specific promising cultivars for direct seeding under puddled condition, the trial was initiated during Kharif 2014. The treatments included three methods



of crop establishment that i.e. sowing of dry seed, sowing of sprouted seed and normal transplanting in main field , cultivars of high yielding varieties and hybrids of locally available seeds were sown and transplanted in sub-plots replicated in split plot design. The results revealed that, hybrids recorded superior performance over high yielding varieties in all the treatments.

Title of the Trial	:	Evaluation of promising varieties and hybrids for their suitability in direct seeded rice.
Location	:	L-6(A)
No of entries/design/treatment	:	Design-SPD Treatments- Main plots-3 different methods of crop establishment Sub-plots-8 cultivars Replication-3 Nos. Total nos. of plots-72
Crop/Variety	:	HYV-IR-Sub-1, Gomati, MTU-7029,Naveen. Hybrid- VNR-2111,VNR-2355, ARIZE 6444,Loknath.
Date of Sowing	:	Sprouted -04-07-2014 Dry seed- 01.07.2014.
Date of Transplanting	:	24.07.2014
Date of Harvesting	:	VNR-2111-06-10-2014, others 22-1014 & Gomati-27-11-2014.
Observation	:	No variation in maturity observed in all the system but variety VNR-2111 matures early i.e. 115 days and Gomati matures late i.e. 143 days. Yield received from hybrids are in an average 14.2% higher than that of HYVs Rice.

B) RABI-2014-15

1) Long term effects of nutrient on SRI vis-a-vis conventional flooded rice on soil fertility and sustainability in rice based cropping systems.

Repeated the trial during the Rabi season as continued.....

Title of the Trial	:	Long term effect of nutrient of SRI Vis-a-Vis Conventional flooded rice on soil fertility and sustainability in rice based cropping system.
Location	:	L-9(B), (Plot size- 8 sqm)

No of entries/ design/ treatment	:	Design-Split plot design. Treatment- Main plot -03 methods of crop establishment (SRI,DSR & normal transplanting) Sub plot-07 Nutrient Management practices. Replication-03 nos. Total plots-63 nos.
Crop/Variety	:	Rajalaxmi.
Date of Sowing	:	Nursery bed on -01-01-15 for SRI, Conventional and DSR in the main field.
Date of Transplanting	:	SRI-15-01-15, & Conventional 30-01-15.
Date of Harvesting	:	SRI-20-05-15, Direct seedling-22-05-2015 & Conventional -25-05-2015.
Observation	:	No. of tillers & yield per sqm under SRI system in 50 % inorganic & 50% organic found more in comparison to all nutrient management practices & as well as all the methods of crop establishment.

2) Yield maximization of rice through site specific nutrient management.



Repeated the trial during the Rabi season as continued.....

Title of the Trial	:	Yield maximization of rice through site specific nutrient management.
Location	:	L-9(A).
No of entries/ design/ treatment	:	Design-RBD Treatment- 8 nos. Replication-03 nos. Total plots-24 nos.
Crop/Variety	:	Naveen
Date of Sowing	:	08-01-15
Date of Transplanting	:	07.02.2015.
Date of Harvesting	:	27.05.2015.
Observation	:	Tiller found more in Vigour applied plot & yield also found 8.92 % more comparison to RFD applied plots.

STATE COMPOSITION TRIALS

A) Kharif-2014-15

1) Title of the Trial	:	Performance study of different Aromatic & Hybrid cultivars under low land condition of Tripura.
Location	:	L-7 , (Plot Size-12 sqm.)
No of entries/ design/treatment	:	Design-RBD Treatment- 15 nos. Replication-03 nos. Total plots-45 nos.
Crop/Variety	:	Aromatic Rice:- Sugandhi samba, Kali Khasa, Birni, Joha Black, Joha white & Harinarayan. Hybrids Rice:- PAC-8744, Loknath, PHB-71, VNR-2111, DRRH-3 VNR-2355, ARIZE-6444, JKRH-401 & PAC-835.
Date of Sowing	:	01-07-14
Date of Transplanting	:	22.07.2014.
Date of Harvesting	:	Aromatic Rice:- Sugandhi samba 25-10-2014 & others 10-11-2014. Hybrids:- VNR-2111-25-10-2014 & others 07-11-2014.
Observation	:	Aromatic Rice:- Sugandhi samba gives higher yield with less maturity period in comparison to others. Hybrid Rice:- VNR-2111 matures early & PAC-8744 gives higher yield comparison to other hybrids.



2) Title of the Trial	:	Trial on varietal performance of Ground Nut under rainfed upland condition of Tripura.
Location	:	Tilla-5 (Plot size-6 sqm)

No of entries/design/treatment : Design-RBD
 Treatment- 04 nos.
 Replication-03 nos.
 Total plots-12 nos.

Crop/Variety : Abiskar, TG-37-A, K-6.
 Date of Sowing : 25-08-14
 Date of Harvesting : 28.12.2014
 Observation : Out of these 3 varieties Abiskar has given highest yield per ha. i.e. 10.2% higher than TG 37-A & 12% higher than K-6.



3) Title of the Trial : **Trial on varietal performance of Green Gram.**
 Location : Tila-5 (Plot size-6 sqm)
 No of entries/design/treatment : Design-RBD
 Treatment- 04 nos.
 Replication-03 nos.
 Total plots-12 nos.

Crop/Variety : Green Gram varieties - NM-92, VC-617, SML-668, PDM 139,
 Date of Sowing: 26-08-14
 Date of Harvesting: SML-668:-01-11-2014, NM-92:-07-11-2014, PDM-139:-10-11-2014, VC-617:-07-11-2014.
 Observation: Out of 4 varieties, SML-668 and NM-92 has given the highest yield per ha. i.e. 820 kg/ha when PDM - 139 gives only 542 kg/ha.

(B) RABI- 2014-15

1) Title of the Trial : **Trial on performance of hybrid paddy under irrigated condition of Tripura.**
 Location : L-7
 No of entries/design/treatment : Design - RBD

		Treatment- 8 cultivars of hybrid paddy with 1 check HYV paddy Replication-3 nos. Total plots-24 nos
Crop/Variety	:	Rajalaxmi,Arize-6444(G),Arize(Tej),NK-5251,KRH-4, VNR-2111,Arize-6129(G),VNR-2355,Naveen
Date of Sowing	:	20-12-2014
Date of Transplanting	:	22.01.2015
Date of Harvesting	:	VNR-2111-05/4/15 NABIN-07/4/15 All other varieties 12/5/15 to 19/5/15
Observation	:	The performance of 8 nos. Hybrids are as follows- (MT/Ha), Rajalaxmi-8, Arize 6444(G)- 9.23, Arize Tej (G)-8.6, NK-5251- 10.0, KRH 4- 8.37, VNR 2111- 6.88, Arize 6129 (G)- 8.8, VNR 2355- 8.78, Naveen- 6.80

2) Trial on performance of different Mustard cultivars in different date of sowing.

Rape and Mustard is an important oilseed crop contributing 26 -29% of total oilseed produced in India. The productivity of the available variety in Tripura i.e B-9, Jhumka has got 500 kg per Ha. which is unable to meet the demand of this State. Therefore, there is urgent need to introduce new variety to enhance per unit area production of this crop.

Some of the new varieties of Rape and Mustard has been collected from National Research Center Bharatpur, Rajasthan namely YSH-401,NRCH-B-1 & RH-749,Bhabani,PPS-1,Pitambari & Trial has been conducted during Rabi-2014.The Performance of the varieties has been studied on different date of sowing observations are as follows :-



1)Title of the Trial:	:	Trial on performance of different Rape & Mustard cultivars in different date of sowing.
Location:	:	T-1
No of entries/ design/treatment	:	Design - RBD Treatment- 9 (ongoing 2 nos. local cultivars and 7 nos. newly introduced variety of Mustard) Replication-3 nos. Total plots-27 nos.
Crop/Variety	:	PPS-1, Pitambari, YSH- 401, NRCH- B-101, RH- 749,Bhabani. Ongoing variety , B-9,& Jhumka
Date of Sowing	:	D-1- 10/11/2014 , D-2- 25/11/2014
Date of Harvesting	:	First date of sowing has been harvested on 05-02-15 for Bhabani & others are on 11/2/15. The Second date of sowing has been harvested on 21/2/15 for Bhawani & rest on 28-02-2015.
Observation	:	The performance of newly introduced Mustard varieties like YSH- 401, NRCH- B-101, RH- 749 has been compared with the ongoing varieties in different DOS and observed that late sown varieties gives less yield. Yield (Kg/Ha) - YSH- 401- D-1 863.33, D-2- 567.66, NRCH- B-101 - D-1- 810, D-2632, RH- 749, D-1- 782, D-2-675, Bhawani D-1-640, D-2-450, B-9 D-1- 518, D-2-419, Jhumka D-1- 520, D-2-486

PLANT BREEDING DIVISION

The Plant Breeding Division at S.A.R.S., Arundhatinagar, since its inception in 1969 has played an important role in crop improvement and diversification of agriculture in Tripura. There are four substation namely : Nalchar SMF, Gokulpur SMF, RBSPC SMF Teliamura and Churabari SMF where research work is carried out on behalf of Plant Breeding Division.

MANDATE

To act as a State Research Center for acquisition and management of indigenous and exotic crop plant genetic resources (PGR) through exploration, collection, selection & purification of the same for various land & Agro climatic situation and to carry out related research to fortify the socio economic condition of farming community and human resource development for sustainable growth of Agriculture in Tripura State.

OBJECTIVES

- ❖ To plan, organize, conduct and coordinate exploration and collection of desired indigenous and exotic PGR of relevance to Rice crops.
- ❖ To undertake introduction and exchange for augmenting agricultural PGR.
- ❖ To characterize, evaluate, document and conserve rice crop genetic resources and promote their use in our state.
- ❖ To conduct research, undertake teaching and training, develop policy guidelines and create public awareness on PGR of relevance to Agriculture.
- ❖ Liaison with National agencies (IIRR) working in area of rice germplasm.
- ❖ Conduction and Evaluation of different Trials allocated from IIRR, Hyderabad as per indent to find out the suitable lines in Tripura condition through multi-location trials.
- ❖ To produce of "Nucleus" and "Breeder" seeds of different rice varieties for further utilization in seed multiplication system in Tripura State.
- ❖ Exploration and collection of desired indigenous and exotic PGR of relevance to Pulse
- ❖ Exploration and collection of desired indigenous and exotic PGR of relevance to Oilseeds
- ❖ Exploration and collection of desired indigenous and exotic PGR of relevance to Small Millets with All India Coordinated Small Millets Improvement Project under IIMR Rajendranagar, Hyderabad.

KHARIF PROGRAMME-2014-15

A. National Level Trials Conducted : 6 (six) nos.

- i) IVT-VE-TP (12 entries, 1101-1112, SARS, A.D Nagar+ IIRR, Hyd).
- ii) AVT-2E-TP (19 Entries, 1201-1219, Churaibari SMF + IIRR, Hyd)
- iii) AVT-1E-TP (29 Entries, 1301-1329, SARS, A.D Nagar+ IIRR, Hyd)
- iv) IVT-E-TP (49 Entries, 1401-1449, Nalchar SMF + IIRR, Hyd)
- v) AVT-I-BT (29 Entries, 2501-2529, SARS, A.D Nagar + IIRR, Hyd)
- vi) IVT-BT (30 Entries, 2601-2630, Gokulpur SMF + IIRR, Hyd).

Detail Results:

1. IVT-VE-TP - 12 Entries.(1101-1112)-

Over all Mean Grain Yield ranged from 1494.0kg/ha (En. No.- 1107, IET - 24747) to 3326.0 kg./ha (En. No.- 1103, IET - 24743) Days to 50% flowering ranged from 75 Days (Jaldhidhan-

6 (NC - En No- 1101), to 93 Days (En. No - 1106, IET - 24746). Maximum number of panicles/sq. mt. was recorded in Aditya ,Entry No - 1111(409 panicles) , whereas it was minimum in Entry No - 1105 (IET -24745 - 273 panicles), Plant Height varied from 85 cm in (Jaldhidhan-6 (NC - En No- 1101) to 151 cm in Entry No.- 1103, IET - 24743) .

The Entry No.- 1103, IET - 24743 (RCPR - 15 - IR-84899-13-CRA-19-1) derived from a cross IR - 78877-208-B-1 - 1 X IRRI - 132 ranked 1st with 30.52 kg Day⁻¹Hectre⁻¹(3326.67 kg. ha⁻¹), 79 days to 50% flowering and possessed short bold grains. It out yielded national National, Regional and Local Checks by 51%, 65.5 % & 64.3 % on over all mean basis. This Entry showed resistance to *Pyricularia oryzae* & moderate resistance to *Xanthomonas oryzae* (BLB). IET -24743 flowered 4-5 days later in comparison with national Check, hence, this Entry will be shifted to IVT - E - TP under MGRT (Multi Locational Genotype Response Trial).

2. AVT 2 -E-TP - (Entry no - 1201-1219) -

Among these 19 Entries Entry No- 1217(HC) ranked 1st with 69.12 kg Day⁻¹Hectre⁻¹(6566.67 kg.ha⁻¹), Entry No- 1215 ranked 2nd with yield of 68.4 kg Day⁻¹Hectre⁻¹ (6566.67 kg. ha⁻¹), Entry No- 2525 ranked 3rd with 67.66 kg Day⁻¹Hectre⁻¹.(6833.33 kg.ha⁻¹).These three entries will be included Multi locational Genotype Response Trial (MGRT), Kharif 2015.

3. AVT 1-E-TP (1301-1329) -

Among these 29 Entries Entry No- 1320 ranked 1st with 27.65 kg Day⁻¹Hectre⁻¹.(3483.33 kg.ha⁻¹), Entry No- 1322 ranked 2nd with 25.80 kg Day⁻¹Hectre⁻¹ .(3173.34 kg.ha⁻¹), Entry No- 1323 ranked 3rd with 25.39 kg Day⁻¹Hectre⁻¹.(3123.30 kg.ha⁻¹). The overall mean Days to 50% flowering & plant height ranged from 75 days in Entry No -1328(Regional Control - Narendra -97) to 99 days in Entry No -1320(IET No - 23976,MTU -1160) and 98 cm in Entry No -1307 (Local Control - Satabdi) to 132 cm in Entry No -1322 (IET No - 24081,HRI -181) respectively. These three Entries will be Promoted to Multi locational Genotype Response Trial (MGRT) within the state Kharif 2015.

4. IVT-E-TP - (Entry no - 1401-1449) -

Among these 49 Entries Entry No- 1447(LC- Satabdi) ranked 1st with yield of 42.30 kg Day⁻¹Hectre⁻¹.(4780.0 kg.ha⁻¹), Entry No- 1445 ranked 2nd with 39.57 kg Day⁻¹Hectre⁻¹.(4550.0 kg.ha⁻¹), Entry No- 1412 ranked 3rd with 38.62 kg Day⁻¹Hectre⁻¹.(4750.0 kg.ha⁻¹).These three Entries will be included in Multi locational Genotype Response Trial (MGRT) Kharif 2015.

5. AVT-1- BT (2501 - 2529) -

Over all Mean Grain Yield ranged from 850.0kg/ha in the Entry No -2518(IET - 23367, HKR 08 - 425) to 4340 kg /ha in Entry No - 2504(Pusa RH -10). Among this 29 Entries, the Check Entry No - 2504(Pusa RH -10) exhibited superior performance in SARS, A.D. Nagar with 35.87 kg Day⁻¹Hectre⁻¹. (4340 kg.ha⁻¹), The overall mean Days to 50% flowering among the test Entries ranged from 86 days in Entry No -2503(IET - 24562, Improved Pusa RH 101) to 101 days in Entry No -2528(Pusa Sugand - 5) while among the checks , Entry No - 2517(QC, Taroari Basmati) was earliest to flower with 90 days to 50% flowering followed by 91 days

in case of Entry No - 2504(Pusa RH 10), 95 days in Entry No- 2509 (Pusa Basmati 1121 - Q & YC), & in Entry No 2519(Local Check- Tulaipanji) and 99 days in Entry No - 2514(Pusa Basmati -1- YC). The Mean No of Panicles per sq. mt ranged from 262 in the Entry No - 2518(IET - 23367, HKR - 08-425) to 481 in the Entry No - 2526(IET - 24576, Pusa - 1884 - 9 -12 - 14) The Mean Plant Height ranged from 118 cm in the Entry No - 2518(IET - 23367, HKR - 08-425) to 167 cm in the Entry No- 2502(IET - 23362, P- 1568 - 05 - 5-6-4-153) The Entry No- 2506 ranked 2nd with yield of 29.19 kg Day⁻¹Hectre⁻¹.(3590 kg.ha⁻¹), Entry No- 2525 ranked 3rd with 28.19 kg Day⁻¹Hectre⁻¹.(3553.50 kg.ha⁻¹). The norms of promotion / recommendation of the entries in the Trial are desirable Basmati quality traits on par or better than the Quality Checks combining 5.0 % yield superiority over best checks. These following Entries have all ready been selected for further evaluation of in SARS, A.D. Nagar during Kharif, 2015-16. The Entries 2504, 2509, 2511, 2514, 2505, 2512, 2506, 2525, 2522, 2523, 2526 and 2529 will be included in MGRT (Basmati) trial within the state.

6. IVT- BT -(Entry no -2601 - 2630)

Among these 26 Entries Entry No- 2607(HC) ranked 1st with 46.56 kg Day⁻¹Hectre⁻¹ (5354.17 kg.ha⁻¹), Entry No-2606 ranked 2nd with 41.12 kg Day⁻¹ Hectre⁻¹ (5037.50 kg.ha⁻¹), Entry No- 2605 ranked 3rd with 38.29 kg Day⁻¹Hectre⁻¹.(4862.50 kg.ha⁻¹). These three Entries will be included Multi locational Genotype Response Trial (MGRT) for Kharif 2015.

B. Station Trial:

This station trial comprising of Multi locational Genotype Response Trial (MGRT), Progeny Row Selection, Maintenance of Nucleus & breeder Seed, Collection Maintenance of Local Germplasm & others well performed entries from different Advance Varietal Trials & Initial Varietal Trials.

I) State Composition-19 Entries (IRON-9 + F-7 progenies of Diallele cross-6 + Selection from DRR trials) - Excellent performing cultures were selected for further evaluation of these cultures under multi locational Trial in the next Season (Kharif 2015).

II) Progeny Row Trials (Maintenance and production of Nucleus & Breeder seed) : Total Breeder seed Produced for different Paddy Varieties in all the 4 designated Govt. Identified Farms and in SARS during Kharif, 2014 -15 is 697.0 Kg .

a) High Yielding (HYV): (i) IR-64 (ii) TRC-2013-4 (iii) TRC-2013-5 (iv) TRC-2013-12. (v) NEDA. (vi) AR-06-09-07 (vii) AR-07-09-07, (viii) NDR-359, (ix) NDR-97, (x) Ranjit, (xi) MTU-7029, (xii) Sahbhagi Dhan, (xiii) IR-64, (xiv) MTU-1010, (xv) Gomati, (xvi) Satabdi, (xvii) Charang.

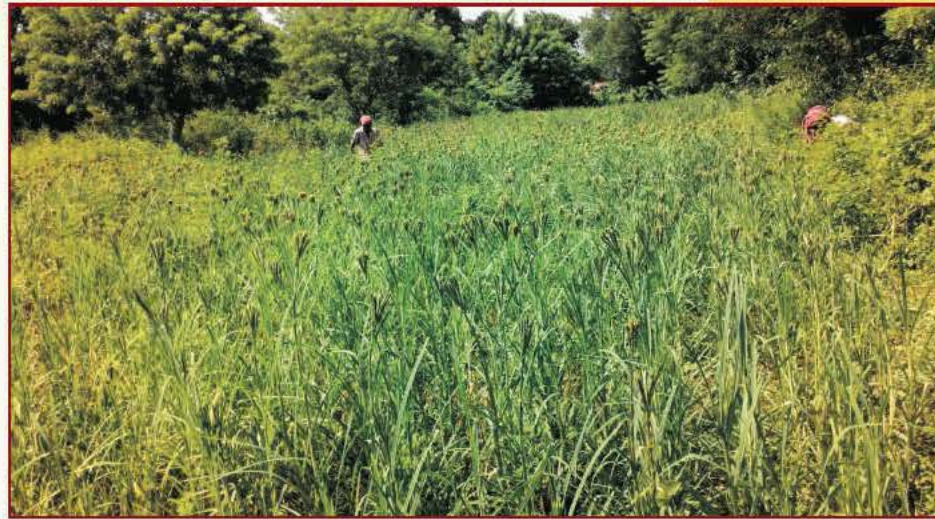
b) Aromatic Rice: (i) Kalikhasa (ii) Harinarayan, (iii) Sugandha Samba, (iv) ASG-2401 (v) Badshahog, (vi) Tulaipanji (TP-SEL-2012), (vii) Kalonania, (viii) Joraphul, (ix) Bisni.

c) Local Germplasm : Gheegaj and some other Jhum cultures

d) Black Rice Local Cultivars : i) Maimee Hanger, ii) Chakhao.

C. Screening of Finger Millets Germplasm comprising of 46 cultures -

Among these, 46 genotype of Finger Millets, 36 nos. have been selected on the basis of yield performance & other yield attributing parameters & promoted for next season screening programme.



Screening of Finger Millet Genotypes at SARS during Kharif 2014-15.

BORO PROGRAMME-2014 -15

I) AICRIP on Rice Trials :

This Initial Varietal Trial -Boro (IVT-Boro) - 13 entries including checks.

Among these 13 Entries Entry No- E-7 ranked 1st with $38.24 \text{ kg Day}^{-1} \text{ Hectre}^{-1}$ ($5700.75 \text{ kg.ha}^{-1}$), Entry No- E-8 ranked 2nd with $32.24 \text{ kg Day}^{-1} \text{ Hectre}^{-1}$ ($4996.75 \text{ kg.ha}^{-1}$), Entry No- E-3 ranked 3rd with $28.11 \text{ kg Day}^{-1} \text{ Hectre}^{-1}$ ($4554.0 \text{ kg.ha}^{-1}$). Replica of this trial has been conducted at Gokulpur SMF and found the same result which is at par with the trial results conducted in S.A.R.S., A.D Nagar. Among these 12 (twelve) entries No-E7 ranked 1st with $30.21 \text{ kg Day}^{-1} \text{ Hectare}$ ($5321.25 \text{ kg.ha}^{-1}$), Entry No-E8 ranked 2nd with $29.21 \text{ kg Day}^{-1} \text{ Hectare}^{-1}$ ($4245.75 \text{ kg.ha}^{-1}$), Entry No-E-3 ranked 3rd with $27.11 \text{ kg Day}^{-1} \text{ Hectare}^{-1}$ ($4224.40 \text{ kg. ha}^{-1}$) these three entries will be included for multilocal Genotype Response Trial (MGRT) within the State.

II) State Composition :

1) Multilocal Genotype Response Trial (MGRT) -

MGRT comprising of 18 Genotypes has been conducted following RBD Design with 2 Replication at Churaibari SMF, RBSPC, Teliamura, & Gakulpur SMF. The best three genotypes will be promoted for further evaluation and towards variety release in the State.

2) Progeny Row Trials (Maintenance of Nucleus & Breeder seed)

i) Paddy



Single Panicle sow being the part of Progeny Row Trial

Progeny Row Trial has been conducted following Double Row System (20cm x 20cm x 40cm) with 20 numbers of different germplasm, cultures, promising entries & varieties with a endeavor to maintain Nucleus & Breeder seed .

a) **High Yielding Varieties (HYV):** Nucleus Seed has been maintained through desired panicle selection from these 14 numbers of High Yielding Varieties (HYV) namely 1.) Chandan (2.) Naveen (3) Krishna Hamsa, (4.) IR-64, (5.) Sahbhagi Dhan (7). Satabdi (8.) TRC-2013-4, (9.) TRC-2013-12 (10.) TRC-2013-5, (11.) AR060907 (12.) Bridhan-14 , (13). Bridhan - 29, (14) Bridhan-28. As well as 192.5 kg of breeder seed has been produced, comprising all the varieties under progeny Row Trial (PRT)



H.Y.V var. Naveen



H.Y.V var. Chandan



H.Y.V var. Krishna Hamsa



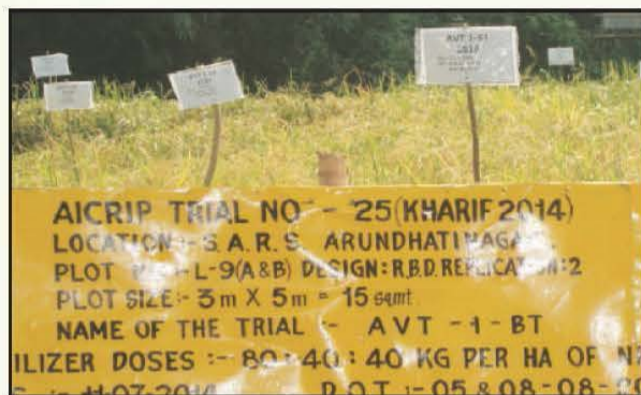
H.Y.V var. TRC-2013 -5



HYV var. IR-64

b) Aromatic Rice: Nucleus Seed has been maintained through desired panicle selection. From these 9 numbers of Aromatic Rice Varieties namely (1.) Sugandha samba, (2.) ASG-2401, Some Basmati Cultures (AVT-1-BT 2514,AVT-1-BT 2504, AVT-1-BT 2509, AVT-1-BT 2511, AVT-1-BT 2512, AVT-1-BT 2505,AVT-1-BT -2510)

Total 142.00 kg of breeder seed has been produced during Rabi 2014 - 15



Aromatic Rice var. Sugandha Samba



Trial on Aromatic Rice, Kharif ,2014-15

c) Local Germplasm: Nucleus Seed has been maintained through desired panicle selection from these 6 numbers of Local Germplasm namely 1.) Chakhao. (2.) Maimee Hanger (Black Rice) 3) Banga Bhush,(4) Bhusak, (5) America , (6) Faterasen.

During Rabi 2014 -15, 28.00 kg of breeder seed has been produced



Local Germplasm var. Maimee Hanger

ii) Oil Seed:

Breeder Seed produced

1. Mustard: Var.- RH 749 - 11.250 Kg, B-9 = 5.0 kg, NRCH-B-101 = 25.0 kg,
2. Mustard: Var.-YSH-401 (Yellow Sarson)= 1.5 Kg, Pitambari = 3.5 kg.



Mustard : Var.- NRCH-B-101 (Gukulpur SMF)

iii) Pulses :

Breeder Seed produced

1. Lentil: Var.- Maitree = 500 gm, Var. -Subrata = 1.0 kg.

III) Performance Evaluation of Hybrid Rice

1. Hybrid Rice Var. -KRH-4 :- The crop matured in 150 days during this Boro 2014-15 and harvested. It was very encouraging performance as yield of KRH-4 was found about 7.7 MT per ha. It was Non-sticky in nature.



Hybrid Rice var. KRH-4

Promising Entry from SARS: Arundhati 2014 - 1 (NEDA) (10.0 kg) - Which has been sent to IIRR, Hyderabad for nomination of this entry against the trial IVT- IME, during Kharif 2015 - 16.



Promising Entry NEDA (Arundhati - 2014 -1)



Promising Entry from SARS: NEDA (Arundhati - 2014 -1) - Which has been sent to IIRR, Hyderabad for nomination of this entry against the trial IVT-IME.

PEST MANAGEMENT DIVISION.

STATE COMPOSITION TRIALS :- Pest management Division of State Agriculture Research Station, Department of Agriculture, (An AICRIP Centre), Government of Tripura has been established with the mandate of adaptive research to conduct studies on Pest and Disease Management of Crops in Tripura. Research Programme undertaken on Agril. Entomology and Plant Pathology disciplines comprising studies on Host Plant Resistance, Pest-Disease Management, Insect Pest and Disease Observation Nursery and Trials on Integrated Pest-Disease Management.

BPH outbreak was reported from four (4) Agri. Sub-Divisions (viz. Rajnagar, Bokafa, Melaghar and Jirania) during September –October 2014. In Boro paddy there was invasion of Seedling Blight in Salema Agri. Sub Division. Insecticides like Acephate, Buprofezin and Imidacloprid were effective against plant hoppers whereas spraying with Carbendazim 25% + Mancozeb 50% gave satisfactory result.

The salient features of trials conducted during the 2014-15 are as follows-

Kharif Season:-

No. of Trials under taken-Four (4)

1. National Screening Nursery-1
2. Donor Screening Nursery
3. Monitoring of field virulence of *Xanthomonas oryzae pv oryzae*

Data of these above three experiments were sent to DRR, Hyderabad for analysis etc.

4. Evaluation of Botanical pesticides on insect pests & diseases of paddy- A state composition experiment was conducted with locally prepared botanical pesticides.

Evaluation of Botanical pesticide on major insect pest of paddy.



GENERAL OBSERVATION: Bel leaves extract was recorded better in comparison to other botanical pesticide in respect of germination percentage in seed bed. No disease pest was recorded when the crop(Paddy) was treated with botanical pesticides whereas in the control plot infestation of leaf eating insects (Leaf folder and Grass hopper) along with diseases like BLB ,Sheath Blight were recorded at level below threshold. Yield was recorded maximum

from neem extract treated plots in comparison to other treated plot.

Details:

Treatment	-	8 nos.
Replication	-	3 nos.
Variety	-	Naveen
Plot Size: - 4 x 5 mtr.	=	20 sq.mtr



Treatment details-

- T1 = Neem leaves extract- @ 50ml/ltr water
- T2= Bel leaves extract @ 50ml/ltr water
- T3 = Moringa leaves extract @ 50ml/ltr water
- T4 = Ipomea leaves extract @ 50ml/ltr water
- T5 = Lantana camera- leaves extract @ 50ml/ltr water
- T6 = Cow urine - 50ml/ltr water
- T7 = Neem leaves extract + cow urine - 50ml/ltrwater
- T8 = Control .

Result:

- 1) Nursery bed - Germination percentage was highest i.e. 85.09% recorded when seeds treated with Bel leaves extract followed by other treatment in comparison to control plot.
- 2) Foliar Spray :- Recorded lowest population of leaf folder in ipomea leave extract and Neem leaves extract + cow urine treated plot i.e 0.33 whereas lowest population of grass hopper was found in Bel leaves, lantana camera and Neem leaves extract + cow urine (0.33) followed by other treatments in comparison to control plot after 30days of first spray.
- 3) Yield was recorded in Neem leaves extract plot i.e 7.05 kg in comparison to control plot i.e. 3.25 kg.

Boro Season:-

Number of Trials under taken-Four (4)

- i. Incidence of major pest and diseases of Oil Seed (Mustard) during Rabi 2014-15.
- ii. Evaluation of Chemicals against major pest and diseases of Paddy.
- iii. Evaluation of Bio-control agents against major rice diseases of Tripura.
- iv. Monitoring of pest and diseases of Lentil.

I) Incidence of major pest and diseases of Oil Seed (Mustard) during Rabi 2014-15.

Among the eight varieties maximum population of aphid was recorded in the variety Panth Pilli Sarshya (PPS) in comparison to other varieties. Besides this minor insects flea beetle and Alternaria leaf spot was noticed at very low level.

II) Evaluation of chemicals against major insect-pests of paddy.

Eight treatments were taken including control. Stem borer larvae were recorded at 45DAT, besides this few population of grass hopper and leaf folder was also noticed. 1st spray was done after 2days of observation. Population of Stem borer leaf folder was almost nil in all the treated plot after 15 days of spray whereas in control plot population of above mention pests were found increasing in respect to the first observation. Among all the treatments, in Chlorantraniliprole 0.4GR (Fertera), Pyidalyl 10EC (Sumpleo), Flubendiamide 20WG (Monori) treated plots population



of stem borer and leaf folder recorded less after 15 days of spray.

Details:

Treatment	: -	8 nos.
Replication	: -	3 nos.
Variety	: -	Rajalaxmi
Plot Size	: -	4 x 5 mtr = 20 sq.mtr

Treatment Details :-

- T1 = Pyridalyl - 10 E.C
- T2 = Flubendiamide - 20 WG
- T3 = Chlorantraniliprole - 0.4 GR
- T4 = Deltamethrin + Triazophos - 35 E.C
- T5 = Clothianidim - 50 WPG
- T6 = Imidachloroprid - 17.8 SL
- T7 = Bifenthrin - 10 E.C
- T8 = Control.

Result:

- 1) Population for insect pest recorded are Stem borer, leaf folder, grass hopper VIZ 2.33, 2, 1.66 / Plot before treatment i.e. 48 hrs at 35 DAT.
- 2) Foliar Spray - Among the 8 nos. treatments population of stem borer and leaf folder were recorded nil in sumpleo, Fatera treated plot followed by other treated plots in comparison to control plot (3.66 and 4.33/plot) whereas incase Grass Hopper population was recorded nil only in Fatera treated plot in comparison to control i.e. 3.66 /plot after 15 days of spray.
- 3) Yield - was recorded maximum in Fatera treated plot i.e. 34.210 kg followed by other treated plot in comparison to control plot i.e. 27.270 kg.

III) Evaluation of Bio-control agents against major rice diseases of Tripura.



Four bio-agents in two different dosages were used.

Trichoderma viride, *T. harzianum*, *Pseudomonas fluorescens* and *Bacillus subtilis*

Seed was treated with all above four bio-agents before sowing. All the treatments were recorded effective in controlling diseases in seed bed condition.

Standing crop- Diseases like BLB, Blast, Sheath Blight, Sheath Rot was initially recorded in the

main field at 50 DAT (Pre treatment observation). Treatments were done with the above bio-agents after 24 hrs of pre treatment observation.

Among the treated bio-agents *Trichoderma viride* and *Pseudomonas fluorescens* @8 gms per ltr of water was recorded effective against BLB,Blast, Sheath Blight, Sheath Rot.

IV) Monitoring of pest and diseases of Lentil.

No insect-pests were recorded except sporadic incidence of wilting.



Field Programme:-

1. Conducted IPM demonstration at Baikunthapur Village under Mohanpur Agri. Sub Division, in Rice vegetable cropping system, in collaboration with ICAR National Research Centre for Integrated Pest Management, New Delhi.
2. Organized farmers' field day on 19th December 2014 at Hezamara Block.
3. Attended Plant Health Clinics.



An effective IPM tool

STATE SOIL TESTING LABORATORY



STATE SOIL TESTING LABORATORY

Introduction:

Soil Testing is a unique tool for rational fertilizer use. It acts as a watchdog to safeguard soil quality, monitoring of soil health and environment overtime. The State Soil Testing Laboratory at State Agriculture Research Station, Arundhatinagar was established in the year 1971, devoted to extend the soil testing advisory service to farming community of Tripura with the following objectives.

- 1) To assess the soil nutrient status and recommending suitable and economic fertilizer doses through chemical fertilizers and organic manures for different crops.
- 2) To identify the type and abnormalities like soil acidity etc. and to suggest effective remedial measures.
- 3) To maintain soil health and productivity through judicious application of chemical fertilizer in conjunction with organic manure and bio-fertilizers.

In a nutshell, The Soil Testing Laboratory plays a vital role for technology transfer in the field of nutrient management, soil health & fertility improvement and thus becoming an important sector of agriculture.



SOIL TESTING LABORATORY

Status Report:

The State Soil Testing Laboratory at State Agriculture Research Station, Arundhatinagar analyzed 9543 (Nine Thousand five hundred forty three) nos. soil samples of West, Sepahijala, Khowai, Dhalai, North districts through static and mobile van during the year 2014-2015 and provided crop based fertilizer recommendation through Soil Health Cards (SHCs) to the Farmers.

Table No: 1. Sub-division wise soil samples analyzed & Soil Health Card issue during the year - 2014-15.

Sl. No	Name of Sub-Division	Soil sample analyzed. (in nos.)	Soil Health Cards Issued
1.	Melagarh	1260	1260
2.	Mohanpur	664	664
3.	Dukli	219	219
4.	Tulashikar	28	28
5.	Teliamura	249	249
6.	Non-Block	19	19
7.	Mandwi	495	495
8.	Jirania	350	350
9.	Khowai	420	420
10.	Bishalgarh	666	666
11.	Chawmanu	311	311
12.	Gandacherra	64	64
13.	Salema	479	479
14.	Kadamtala	220	220
15.	Panisagar	1025	1025
16.	Kanchanpur	641	641
17.	Kumarghat	235	235
18.	Amarpur	90	90
19.	Matabari	414	414
20.	Rajnagar	01	01
	Total	7850	7850



Mobile Program at Dukli Sector

In the Year 2014-15 the following Mobile Soil Testing Program was attended:

Table No: 2. Mobile programs in different sub-divisions.

Sl. No	Name of Agri. Sub-division	Nos. of samples tested
1.	Teliamura	493 nos.
2.	Khowai	75 nos.
3.	Tulashikar	47 nos.
4.	Jirania	210 nos.
5.	Mohanpur	100 nos.
6.	Mandwi	147 nos.
7.	Dukli	100 nos.
8.	Bishalgarh	120 nos.
9.	Melagarh	201 nos.
	Total	1493 nos.

Out of 9543 nos. soil sample analyzed, 21.81 %, 49%, 68% soils are found deficient in terms of organic carbon, available phosphorus and available potash respectively. 7.6% soils are found strongly acidic (4.8 to 5.0 pH).

Table No: 3 District wise Nutrient status of soils analyzed in SSTL, SARS, A.D Nagar.

Name of Districts	Total sample analyzed	O/C (Nutrient status)			P2O5 (Nutrient status)			K2O (Nutrient status)		
		Low	Medium	High	Low	Medium	High	Low	Medium	High
West	5863 nos.	1208 nos.	2037 nos.	2618 nos.	2677 nos.	1923 nos.	1263 nos.	3998 nos.	1121 nos.	744 nos.
Dhalai	854 nos.	179 nos.	350 nos.	325 nos.	514 nos.	193 nos.	147 nos.	630 nos.	131 nos.	93 nos.
North	2321 nos.	626 nos.	664 nos.	1031 nos.	1350 nos.	663 nos.	308 nos.	1611 nos.	398 nos.	312 nos.
South	505 nos.	68 nos.	145 nos.	292 nos.	204 nos.	174 nos.	127 nos.	336 nos.	100 nos.	69 nos.
Total	9543 nos.	2081 nos.	3196 nos.	4266 nos.	4745 nos.	2953 nos.	1845 nos.	6575 nos.	1750 nos.	1218 nos.

(Organic Carbon (%): Low : <0.5, Medium : 0.5-0.75, High : > 7.5)

(Available Phosphorous (kg/ha): Low : <28, Medium : 28-56, High : > 56).

(Available Potash (kg/ha): Low : <140, Medium : 140-280, High : > 280).



Soil Testing Camp organized in Dukli Sector

Activities of Static and Mobile Laboratory.

1. Generally soil samples are tested through Quick/Field method for speedy reporting to the farmers as early as possible through Soil Health Cards.
2. A facility has been created to upload all the Soil Health Cards along with fertilizer recommendation in the web page of Department of Agriculture, Govt of Tripura. So that the farmers can view their status of soil etc. from any corner of the State.
3. One Composite Mobile Soil Testing Van (purchased under NPMSH&F, July'2012) is also devoted to farming community. The said Van moves to different Sub-divisions of West, Khowai, Sepahijala, and Dhalai districts for analysis of soil samples in-situ by organizing soil health camps. Reports through Soil Health Cards are distributed to the farmers on the same day.

Other Activities:

- 1) Implementation of different Centrally Sponsored Schemes like Soil Health Management under NMSA and issuance of Soil Health Cards online.
- 2) Participation in the Soil testing Camp, Vegetable Show etc. organized in the different parts of the state to build confidence and awareness among the farmers through training regarding collection of soil samples, the benefits of soil tests and its relation with productivity and restoration of soil health.
- 3) Skill development, capacity building etc. on soil tests among the officers and staff working in the different Soil Testing Laboratories of the State by means of training.
- 4) 548 nos. soil samples of Tea Growers were analyzed.
- 5) 43 (Forty three) nos. college students attended from Doon College of Agriculture Science and Technology and B-FIT college of Dehradun regarding preparation of the their final year project work (RAWE) on soil Testing.
- 6) Students of Womens' College, Ramthakur College, Tripura University, etc. even now and then are supported to analyze soil samples as a part of their course of study.



Humus rich soil-for sustainable production

STATE SEED TESTING LABORATORY.



Objective:

The main objective of Laboratory is to confirm the seed quality to the prescribed seed standard with a view to attain self sufficiency of the State in production of quality seed. With this point of view this laboratory was set up and has been functioning as unnotified laboratory since 1985-86. Later on this laboratory got its legal status by notification under Section-4(2) of Seeds Act 1966 on 20.03.2002. In this laboratory the representative sample drawn from the processed seed lots pertaining to seed fields are analysed to assess their quality with respect to four mandatory tests namely

- i) Physical purity test
- ii) Germination test
- iii) Moisture test
- iv) Seed Health test

Besides these, another test namely T.Z Test (Tetrazolium Test) is also being conducted to assess the viability of seed, if required.



At present Tripura is self sufficient in seed production(paddy).And the excess seed (specially paddy and mustard) are being sent to our neighboring states on the basis of MOU signed between NSC with our State Government successfully.

Target:

The capacity of testing sample at the laboratory is 6000/annum.But testing of 2000 samples/year is sufficient enough to fulfil the State requirement to replace the seeds.As of yet there was no fixed target for State Seed Testing Laboratory.However, a target for testing of 3000 number of seed samples has been fixed up by the Department for the year 2015-16.

Achievement:

Year	Total Nos. of sample tested			Recommended for certification				Total no of samples tested	Quantity in M.T
				Certified		Foundation			
	Cert.	Serv.	Total	No. of Sample	Quantity (MT)	No. of Sample	Quantity (MT)		
1	2	3	4	5	6	7	8	9	10
2003-2004	436	75	511	406	955.810	1	12.300	511	1170.96
2004-2005	598	126	724	566	1298.790	15	65.579	724	1591.382
2005-2006	1496	101	1597	1303	3471.868	157	143.434	1597	3973.3415
2006-2007	1494	216	1710	1143	3527.359	309	729.724	1710	5075.503
2007-2008	1155	213	1368	1026	2468.260	101	223.518	1368	2809.831
2008-2009	1531	188	1719	1357	4079.883	122	641.598	1719	4822.0172
2009-2010	1442	187	1629	1324	3509.700	61	100.432	1629	3776.9699
2010-2011	1475	103	1578	1328	3892.620	66	89.5615	1578	4126.0358
2011-2012	1559	137	1696	1438	3375.3125	78	113.9405	1696	3555.495
2012-2013	1864	158	2022	1692	3733.582	77	138.73385	2022	4038.60775
2013-2014	1508	187	1695	1377	2979.8533	57	107.72775	1695	3233.280972
2014-2015	1722	221	1943	1573	3398.4565	94	129.2270	1943	3604.779567

AGRICULTURE INFORMATION UNIT

To increase production and productivity, farmers need latest Agricultural technology. Transfer of Agricultural technology from laboratory (Research) to the farmers field (Land) is highly necessary to boost-up production. Agriculture information unit is playing a vital role in this context.

Agriculture information unit has many sections:- 1) Printing, 2) Photography, 3) Audio - visual, 4) Art etc.

During the year 2014-15 this unit published many multi-coloured 1) booklet, leaflet, folder, 2) Audio-visual materials, 3) Flex - hoardings 4) Technical Bulletin/Press release etc. to disseminate technical know-how to the farming communities of Tripura.

These are as follows:-

- 1) Booklet on scientific cultivation technology of Maize.
- 2) Booklet on scientific cultivation technology of Lentil.
- 3) Booklet on scientific cultivation technology of Mustard.



- 4) Folder on scientific cultivation technology of Groundnut.
- 5) Folder on Bio-fertilizer.
- 6) Folder on scientific cultivation technology of Green gram.
- 7) Folder on scientific cultivation technology of Sesame.
- 8) Folder on scientific cultivation technology of Foxtail millet.
- 9) Folder on Rodent control.
- 10) Folder on scientific cultivation technology of Hybrid Rice.
- 11) Folder on scientific cultivation technology of HYV Rice.

(B) Leaflet published on

- i) Popularization of Hybrid Rice.
- ii) Six principles of SRI method.

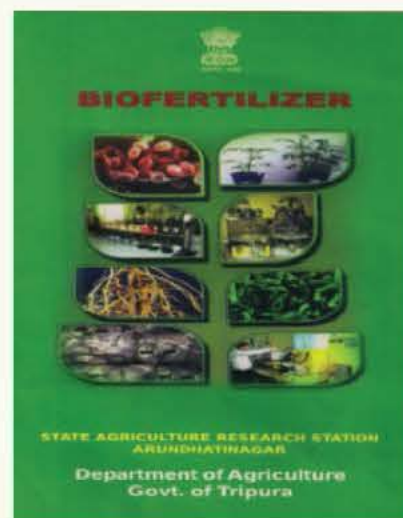
C) Farmers advisory published through ICA Deptt. for the month of :-

- (1) January, 2015.
- (2) February, 2015.
- (3) March, 2015.

Plan exhibition for the year 2015 on the eve of 26th January was held at Umakanta Academy School premises for 5 days. The Agriculture pavilion was made by the Artists of A.I Unit. The display boards and other display materials regarding the progress of Agriculture in Tripura after Independence were installed by the supervision of A.I Unit. Whole structures were brought to the Districts and displayed in the District plan Exhibitions.

D) 2 (two) nos. Jingles are under preparation -

- i) Bio-fertilizer.
- ii) Six principles of SRI.





STATE BIOFERTILIZER PRODUCTION CENTRE



Bio-fertilizer is a liquid or carrier based inoculants containing useful microorganism, in sufficient numbers to help in plant growth, protection and nutrition. They are widely accepted as low cost supplements to chemical fertilizers and environment friendly to maintain soil health for sustainable agriculture. Biofertilizers viz., Rhizobium, Azotobacter, Phosphate Solubilizing organisms, Potash Mobilizing Microorganisms have been found as effective tool in fertility management and biological nutrient mobilization. Recently

customized consortia of such bio fertilizer organisms better adapted to local climate condition have also been developed are available commercially. Efficiency of such microbial formulations is much higher in presence of organic situation, therefore application of such input need to ensure under all cropping situations.

The State Bio-fertilizer Production Centre at Dutta Tilla had been established in the year 1993. The production quantity has been increased chronologically with the increase of farmers demand. In the year 2014-15 the total production was around 38 MT which was distributed to the farmers of Tripura.

The microbial strains being maintained in the centre are Azotobacter, Biophos (PSB), Rhizobium (Groundnut, moong, lentil, cowpea, soyabean, Arhar etc.) and KMB (Potash Mobilizing Bacteria). This centre is always supplying the Biofertilizers as per demand of the research workers of ICAR, Lembucherra, HRC, Nagicherra, College of Agriculture, SARS and Tripura KVK's and also collecting the feedback result on efficacy of supplied materials as and when required.

The centre also acclimatizes the outside collected strains at the local conditions so that they can function properly under local condition beside collection of some local strains. The quality checks of produced lots are being made regularly to supply the quality biofertilizer to the farmers of the State.



Sl No.	Name of the Biofertilizer	Production during 2014-15	Distribution during 2014-15	Revenue collection (in Rs)	Remarks
1.	Azotobacter	3533 kg	3594 kg	1,07,820.00	The centre is proceeding towards production target of 50 MT per year
2.	PSB (Biophos)	4111 kg	3556 kg	1,06,680.00	
3.	Rhizobium	17124 kg	14153 kg	4,24,590.00	
4.	KMB (Biopotash)	13240 kg	12046 kg	3,661,380.00	
	Total	38008 kg	33349 kg	10,00,470.00	



STATE BIO-CONTROL LABORATORY.



Sole reliance on the use of chemical pesticide has the potent threat to serious ecological consequences such as resurgence of pest resistance to pesticide and outbreak of secondary pest and problems of environments pollution. In order to overcome this problem, the strategy, & integrated pest Managements (IPM) is advocated.

Bio-control agents, pesticides of plant origin, pheromones etc. are important components of IPM because of their economic viability and eco friendly nature.



In view of above reason State Bio-control Laboratory established in the year 2011 -12 with the assistance from the Central Govt. at SARS, Datta Tilla, A.D Nagar for mass production of Bio-control agents. Since then this laboratory is producing different Bio-control agents and distributing to the farmers of the state for use on different crops.



STATUS OF DIFFERENT BIO-AGENTS

Sl. no	Name of the Bio-agent	Description	Doses	Recommended for different diseases	Name of the Crop
1.	<i>Trichoderma viride</i> (Trip TV)	It is an antifungal bio pesticides green in colour.	It comes in wettable powder and is applied as 10% paste and slurry or seeds @ 4-5 gm per kg seed/seedlings as quoting or as soil application @ 2.5 kg per ha. after mixing with FYM. It can also be used as foliar spray @ 1 kg per ha.	Root and stem rots, wilt, downy mildew, powdery mildew, white rust, smut, red rot.	Tomato, brinjal, cauliflower, potato, moong, Arhar, coconut, seshamun, banana etc.
2.	<i>Trichoderma harzianum</i> (Trip TH)	Do	Do	Wilt, fruit rot, dieback, root rot.	Onion, cauliflower, tomato, brinjal, mustard, potato etc.
3.	<i>Pseudomonas fluorescens</i> (PF)	It is an antifungal and anti bacterial bio-pesticides.	It comes in wettable powder and is applied as 10% paste or slurry on seeds @ 5 gm per kg seed/seedlings as quoting or as soil application @ 2.5 kg per ha. after mixing with FYM. It can be used as foliar spray @ 1 kg per ha.	Root and stem rots, wilts, downy mildew, powdery mildew, white rust, smut, leaf spot, blast, blight.	Paddy, wheat, ground nut, maize, cucumber, tomato, banana.

Sl. no	Name of the Bio-agent	Description	Doses	Recommended for different diseases	Name of the Crop
4.	<i>Bacillus subtilis</i>	It is antibacterial	It comes in wettable powder and is applied as 10% paste and slurry on seeds @ 4-5 gm per kg seed/seedlings as quoring or as soil application @ 2.5 kg per ha. After mixing with FYM. It can also be used as foliar spray @ 1 kg per ha.	Sheath blight, bacterial wilt, damping off, root-rot, dieback.	Paddy, Tomato, Brinjal, Arhar, Groundnut & Orange
5.	<i>Trichogramma card.</i>	Trichogramma are egg parasitoids. They have been found parasitizing the egg of insect belonging to 7 insect orders. Different spp of <i>Trichogramma</i> 1. <i>T. chilonis</i> 2. <i>T. japonicum</i>	50,000 to 1,50,000 wasps / Ha. (one Trichocard contains about 20,000 wasps)	Stem Borer of Rice, bollworm of cotton, borers of sugarcane, fruit borer of vegetables etc.	Paddy, cotton, sugar cane, brinjal, tomato etc.



Fungal & Bacterial Bio-agents



Trichogramma Card

Production Target and distribution of different Bio-agent are as follows:

Sl. No	Name of the Bio-agent	Year			
		2013-14		2014-15	
		Target (kg)	Achiv. (kg)	Target (kg)	Achiv. (kg)
1.	<i>Trichoderma viride</i> (Trip TV)	-	1547.2	1500	1497
2.	<i>Trichoderma harzianum</i> (Trip TH)	-	119.8	500	500
3.	<i>Pseudomonas fluorescens</i> (PF)	-	12521.5	12000	11643.5
4.	<i>Bacillus subtilis</i>	-	748.4	500	317.
5.	<i>Trichogramma card.</i>	-	55	50	50

STATE PESTICIDE TESTING LABORATORY

The Department of Agriculture, Government of Tripura with the assistance of GOI, established a State Pesticide Testing Laboratory at Dutta tilla, SARS, Agartala and functioning from the year 2006. Pesticide samples are being analyzed in SPTL as and when receives from the Insecticides Inspectors and analysis reports are given to them. The Insecticide Inspectors have to inspect not less than three times in a year all establishments selling insecticides within the areas of their jurisdiction.



ACHIEVEMENT ON PESTICIDE ANALYSIS.

Sl. No	Year	Pesticide samples received	Samples analyzed	Samples sent to CIL	Total
1.	2014-15	24 nos.	5 nos.	19 nos.	24 nos.

The samples which cannot be analyzed in SPTL are being referred to the Central Insecticides Laboratory (CIL), GOI, Faridabad for analysis and obtaining test reports.