

# **TAMILNADU AGRICULTURAL UNIVERSITY**

## **47<sup>th</sup> RESEARCH COUNCIL MEETING**

### **Agenda No.1**

#### **Confirmation of the Proceedings of the 46<sup>th</sup> Research Council Meeting.**

The Proceedings of the **46<sup>th</sup> Research Council** meeting held on **April 23, 2013** were communicated to all the members. If there is no exception to the minutes from the members, it is requested that the Research Council may please confirm the proceedings of the 46<sup>th</sup> meeting.

### **Agenda No.2**

#### **Action Taken on the Recommendations of 46<sup>th</sup> Research Council Meeting**

##### **Agricultural Crops**

- 1. Large scale cultivation of CORH 4 hybrid even like adopting a village is to be planned and executed in coordination with the Department Officials (Department of Rice; Director, CPBG)**
  - Participatory Seed production of CORH 3 and CORH 4 was taken up in Sathyamangalam block in the farmers holdings. The farmers produced hybrid seeds at an average of 800 kg/ac. The produced seeds were procured back and distributed to the farmers.
  - A total of 1500 kg of CORH 4 and 4500 Kg of CORH 3 seeds were supplied to JDAs of Thiruvarur and Ramanathapuram Districts respectively for conducting compact Block Demonstrations by the Department of Agriculture under the Department sponsored NFSM project.
  - To popularize these hybrids, TNAU entered into an MOU with M/S. Rasi seeds Pvt Ltd., for commercialization of CORH 3 & CORH 4 throughout the country. The company paid a licensing fee @ Rs 5.00 lakhs per hybrid to the university through ABD. Public sector organizations such as Gujarat State Seed Corporation and State Farm Corporation, New Delhi have also taken up seed production in CORH 4 in the current year.



CORH 4 farmer receiving the award



CORH 4 Field



Field Day CORH 4 at Thanjavur Dist.



Seed production training at Sathyamangalam



Seed production CORH 4 at Sathyamangalam



Interaction with hybrid seed production farmers

2. **A clear cut strategy on crop breeding activities is to be devised. Though there are ten research centres involved in rice breeding, tangible outcome from these stations is not substantial. A strategic breeding plan should be evolved from hybridization to sharing of materials across the stations so that unwanted duplications can be avoided (Director, CPBG; Director, TRRI)**
- In Tamil Nadu, rice is cultivated in all the districts under multiple seasons and growing conditions. The requirement of Tamil Nadu in terms of rice varieties is diverse and hence there are centres catering to the location specific demands. However, during the Annual Rice Workers' Meet 2013, it was decided that each rice breeding centre will work on the identified unique mandates. The segregating materials are generated in large populations from Aduthurai and Coimbatore (also using marker assisted selection) and shared among all the breeding stations in the state.
  - The new variety Rice CO 51 released in 2013 is getting popular across the state. In the first year of its release so far approximately 500 Qtls of seeds have been distributed. This variety matures in 110 days and yields on an average 6.6 tons per ha.
  - Another rice variety TPS 5 has been released as an alternative to the popular ASD 16. This variety can yield higher than ASD16 and is resistant to rice tungro disease. Two varieties, ADT49 and ADT50 developed from Aduthurai centre are in demand as replacement varieties for BPT5204 and CR1009. Paramakudi centre released a drought tolerant variety ANNA 4 which matures in 105 and can yield 3.7 tons under rainfed condition.
  - TM 07275 (130 days; fine rice); CB 09123 (135 days; superior quality than BPT5204); AS 10024 (120 days; fine rice); ACM 01010 (120 days; slender rice) and CR1009 Sub1 (155 days; tolerant to submergence) are the important rice cultures in the advanced stages of testing (Adaptive Rsearch Trial).
  - The early segregating generations in F<sub>2</sub> and F<sub>3</sub> stage raised at Dept. of Rice are visited by breeders from all the rice experiment stations and selections are made to their needs. Moreover the donors being selected from the national and international trials are shared among the centres.
  - Considering the need to bring in climate resilience and resistance to major biotic factors, the research problems are identified wherein the students are working on integrative breeding tools to improve rice cultivars for drought, submergence, salinity, blast, bacterial blight and BPH resistance.
  - Strategically hybrid rice programme now exploits the modern tools of marker assisted selection to improve the parental lines for blast and

bacterial blight resistance. Upscaling of the test cross nurseries, embarking on quality evaluation of the hybrids are bestowed with higher attention to produce highly heterotic commercially viable hybrids for the state. In order to widen the genetic base among the source nursery and CMS lines, wide compatibility genes are targeted to utilize japonica varieties to fetch high heterosis in our hybrids.

**3. Evaluation of quality parameters in rice that make it suitable for various purposes can be identified and exploited. Besides, the genetic variation and the role of environment on quality parameters of rice may be explored (Director, CPBG)**

- Quality parameters of rice varieties and advanced cultures are assessed at the Department of Rice. Suitability to cooked rice as well as Tiffin purpose is evaluated in-house. Rice quality suitable for export was assessed using quality lab of rice exporters.
- Rice CO51 produces medium slender rice which has excellent head rice recovery of 67%. It possesses intermediate amylose, intermediate gelatinization temperature and soft gel consistency which are critical for superior cooking quality. The recent two varieties, TRY 3 and TPS 5 were specially released for idli purpose as these varieties were characterized to be of short bold type with intermediate amylose, intermediate gelatinization temperature and soft gel consistency. The data on quality estimation of pre-release cultures is appended as Tables 1a to 1i.

**4. All the millets are to be analysed for their nutritional components to exploit them for the improvement of human health (Dept. of Millets; PHTC)**

Different varieties of small millets and their nutritional characteristics were analyzed.

Sample	Products	Place	Variety	Form (Flour)
JL1	Little Millet	Jamunamarathur	CO2	Grain
JL1H	Little Millet	Jamunamarathur	CO2	Dehulled
JL2	Little Millet	Jamunamarathur	CO3	Grain
JL2H	Little Millet	Jamunamarathur	CO3	Dehulled
JL3	Little Millet	Jamunamarathur	CO4	Grain
JL3H	Little Millet	Jamunamarathur	CO4	Dehulled
JL4	Little Millet	Jamunamarathur	Chittansamai (LR)	Grain
JL4H	Little Millet	Jamunamarathur	Chittansamai (LR)	Dehulled
JL5	Little Millet	Jamunamarathur	Kozhuthanasamai (LR)	Grain
JL5H	Little Millet	Jamunamarathur	Kozhuthanasamai (LR)	Dehulled
CK1	Kodo Millet	Coimbatore	Market Variety	Grain
CK1H	Kodo Millet	Coimbatore	Market Variety	Dehulled
CL1	Little Millet	Coimbatore	Market Variety	Grain
CL1H	Little Millet	Coimbatore	Market Variety	Dehulled

CF1	Foxtail Millet	Coimbatore	Market Variety	Grain
CF1H	Foxtail Millet	Coimbatore	Market Variety	Dehulled
PB1	Barnyard Millet	Peraiyur	Sadaikuthiraivali	Grain
PB1H	Barnyard Millet	Peraiyur	Sadaikuthiraivali	Dehulled
PK1	Kodo millet	Peraiyur	CO3	Grain
PK1H	Kodo millet	Peraiyur	CO3	Dehulled

#### Nutrient contents of millet varieties (per 100g)

Sample	Moisture (g)	Ash	CHO (g)	Protein (g)	Fat (g)	Crude Fibre (g)	Calcium (mg)	Iron (mg)	$\beta$ Carotene (mg)
JL1	6.86	3.91	68.84	5.68	4.36	10.35	53.66	33.47	0.12
JL1H	7.54	0.36	85.22	5.68	0.89	0.31	32.80	17.43	N
JL2	8.81	3.70	66.57	5.68	4.40	10.84	48.01	21.01	0.15
JL2H	6.62	1.23	82.82	5.68	3.03	0.62	36.53	16.90	N
JL3	6.65	3.64	69.31	5.68	4.79	9.93	47.48	25.40	0.15
JL3H	7.26	0.59	84.72	5.68	1.21	0.54	29.10	20.35	N
JL4	5.59	3.91	69.72	5.68	4.80	10.30	46.10	22.63	0.14
JL4H	7.21	1.01	82.89	5.68	2.79	0.42	34.57	29.70	N
JL5	7.26	3.51	68.50	5.68	5.24	9.81	49.73	43.85	0.17
JL5H	6.99	0.66	84.85	5.68	1.46	0.36	34.93	44.95	N
CK1	5.46	3.41	72.25	3.98	3.02	11.88	47.74	62.31	0.17
CK1H	6.62	0.43	86.12	5.11	1.16	0.56	33.88	24.06	N
CL1	6.52	3.37	69.16	7.39	4.78	8.78	93.25	16.70	0.13
CL1H	7.29	0.67	82.39	7.39	1.56	0.70	93.13	9.63	N
CF1	6.37	3.57	68.21	6.82	5.93	9.10	134.63	14.63	0.15
CF1H	6.59	0.80	81.19	7.95	2.71	0.70	81.25	26.05	N
PB1	5.32	3.80	67.94	8.52	4.88	9.54	102.88	16.63	0.15
PB1H	5.76	1.20	80.76	8.52	3.09	0.67	20.50	10.05	N
PK1	4.58	3.38	73.67	5.68	2.59	10.10	76.75	32.70	0.34
PK1H	4.89	1.36	84.41	6.82	2.11	0.41	17.13	14.79	N

The moisture content of the grains ranged from 4.58 to 8.81g/100g of the grain. The protein content of the barnyard millet variety obtained from Peraiyur was found to be 8.52g/100g of the grains. The kodo millet grain variety from Coimbatore was found to be high in crude fibre and iron content than the other millet grains. Finger millet was found to contain the maximum calcium content of 134.63 mg/g.

#### 5. Intensification on research in small millets should be geared up with suitable strategic plan (Director, CPBG)

The research work on small millets was intensified through externally funded projects on the specific areas. More students are also allotted to do research work on small millets. The segregating materials are being exchanged between researchers. In addition, seed production of small millets is taken up through farmers' participatory mode.

<b>Crop</b>	<b>Specific area of research</b>
Ragi	Non lodging and non shattering of grains
Varagu	High Culm strength for machine harvest
Tenai	Development of waxy and non-waxy genotypes suitable for Assam and Tamil Nadu for preparation of value added food products

### **Popularization and Seed production of small millets**

In order to popularize small millets a total of 84 FLD's were organized in farmers field as indicated below.

<b>Crop</b>	<b>Scheme</b>	<b>No.of FLD's</b>	<b>Districts</b>
Finger millet	AICRP	10	Krishnagiri
	Part II plan	2	Virudhunagar
Little millet	AICRP	10	Vellore
	Part II plan	3	Nammakkal
Kodo millet	AICRP	10	Villupuram
	Part II plan	11	Salem, Villupuram Cuddalore
Barnyard millet	AICRP	10	Thoothukudi and Theni
	Part II plan	5	Virudhunagar & Tuticorin
Foxtail millet	Part II plan	13	Salem and Dindigul
Proso millet	AICRP	5	Vellore
	Part II plan	5	Vellore

Through farmers participatory seed production approach, approximately three tonnes of seeds of small millets were procured. Apart from the above trainings are also being organized for farmers and women self help groups on production and value addition of millets.



Seed production plot of varagu at Manalur village , Villupuram Dt



Seed production plot of tenai in vedasanthur block, Dindigul Dt



Kudhiraivalli crop at Chettikurichi village, Viruthunagar dist.



Rainfed varagu crop at Alaripatti, Petahnaickenpalayam block, Salem



Rainfed tenai crop at Alaripatti, Petahnaickenpalayam block, Salem



6. **Seed production of maize hybrid CO 6 can be taken up at HC&RI, Periyakulam as JDA, Theni is more interested (Dept. of Millets; Director, CPBG).**

Seed production of maize hybrid was taken up at ARS, Vaigaidam in Theni district and a total of 1400kg of hybrid seeds were produced and supplied to the farmers. In addition, parental seeds of maize hybrid CO 6 was supplied at the request of the Dean, HC&RI, Periakulam for taking up seed production in an area of one acre.

7. **Feasibility of having trials for various millets at AC&RI, Killikulam be explored and executed (Director, CPBG)**

From the ensuing season after discussion with the scientists at Killikulam during Scientists' meet, MLT trials will be allotted.

8. **The irrigation water, being the most precious commodity, the research activities are to further geared up towards water conservation methods and suitable cropping systems. To suit the low water availability, millets and minor millets may be recommended to have the food and nutritional security (Director, CPBG)**

Under plan scheme, 65 Front line Demonstrations were organized in various parts of Tamil Nadu to popularize the cultivation of millets. Trainings and field days were also organized on production and value addition in millets to create awareness among the farmers and women SHG's. Seed production of millets was also taken up through Farmer's participatory approach.

9. **As there had been a slug in the adoption of improved varieties of sugarcane released by TNAU by the farmers as well Cane Officers, concentration on the development / improvement of chewing canes can be taken up (SRS, Cuddalore, Sirugamani and Melalathur; Director, TRRI)**

**SRS, Cuddalore**

- Chewing cane (*Saccharum officinarum*) from different locations viz., Vallam padugai, Pathrakottai, Kurinchipadi, Kullanchavadi, Narasingampettai and Thiyagarajapuram (Near Aduthurai) were collected and planted for multiplication. The variability among the lines for morphological characteristics, yield attributes and quality will be studied.
- About 14000 seedlings were obtained from the bi-parental crosses, poly crosses and open pollinated crosses of sugarcane were and raised for evaluation.

**SRS, Melalathur**

- Three collections of chewing canes (pink black coloured) one from Salem area, two from Trichy area were planted during January 2014 (early season) at SRS Melalathur for further multiplication and evaluation.

10. **Availability of parental seeds of maize hybrids, Lucerne CO 2, CO FS 29 to the Dept. of Animal Husbandry is to be ensured (Director, CPBG)**

Sufficient quantity of seeds of fodder maize, Lucerne CO 2 and CO (FS) 29 is available for supply to Dept. of Animal Husbandry. Supply will be made once the indent is received.

11. **The release proposal for a variety/hybrid in any crop will be entertained only when the breeder(s) concerned are with seed material to cover a minimum of 100 to 200 acres. (Director of Research)**

The availability of seeds of new releases is ensured before the release. The proposals for variety/hybrid release is accepted only with the availability of seeds.



**12. All MLTs and ARTs planned for testing advanced cultures and technologies should be monitored by a team of scientists identified for each crop and technology for execution and deriving output (Director, CPBG; Director, CM and Dean, AEC&RI, CBE & Dean, HC&RI, CBE)**

- During the Production Oriented Survey undertaken by the Dept. of Rice, TNAU, Coimbatore, scientists visited ARTs on rice.
- Professor and Head along with MULLaRP Scientist, Department of Pulses visited NPRC, Vamban on 24.01.2014 to monitor MLT on various pulses.
- The Multi location trials of groundnut and sunflower laid out at different stations are periodically monitored by the scientists of TNAU during Kharif and Rabi seasons. The scientists' concerned are visiting the MLT plots and monitoring the performance of pre release cultures.
- The pre-release cultures in banana such as H212, H96/7, H531 and NPH-02-01 are being multiplied *in vitro*. After producing sufficient number of plantlets, the cultures will be distributed to farmers and research stations for taking up MLT/ART.

Hybrids	Parents	Plants raised in field	Suckers available
H212 (AB)	Karpooravalli x Pisang Lilin	50	100
H96/7 (ABB)	Karpooravalli x H 201	20	20
H531 (AAB)	Poovan x Pisang Lilin	25	30
NPH-02-01 (AAB)	H 201 X Anaikomban	20	25

Propagation through tissue culture has been initiated in all these hybrids for conducting MLT/ART.

**13. Suitable measures for plant variety protection and registration for all the released varieties / hybrids, extant varieties have to be completed (Director, CPBG)**

- For registration under PPV&FRA, the proposals on released rice varieties / hybrids viz., CO 43, CO 47, CO 48, CO 49 and CO 50, CORH3 have been submitted.
- Recently released pulses and millets varieties/hybrids were registered with PPV&FR authority. The recently released cotton varieties viz. MCU 12 and MCU 13 were already registered.
- Applications for the registration of groundnut varieties CO4, CO5, CO6 and CO7; sunflower varieties CO4, CO5 and hybrid CO2 have been submitted to the PPV & FR Authority.

14. **Various inputs required for organic agriculture are to be critically evaluated and documented (Director, CM)**

The Department of Sustainable Organic Agriculture was formed during June, 2013 and experiments on various inputs are initiated already and further studies are to be included. Valid results are expected after two to three season experimentation.

15. **Integrated Farming System as suggested by the Government of Tamil Nadu has to be emulated in all the Colleges/Research Stations by having the animal husbandry component (Director of Research/ Director, CM / Dean, HC&RI)**

Integrated Farming System Models have been established at wet land and garden land ecosystems at the Department of Farm Management, Directorate of Crop Management, Tamil Nadu Agricultural University and Coimbatore. The following are the models

- a. Wet land Integrated Farming System  
Rice based cropping system+ Fish+ Turkey+ Goat+ Biogas+ Kitchen garden+ Mushroom
- b. Garden land Integrated Farming System  
Maize based cropping system+ Milch cow+ Biogas+ Goat + Vermicompost

16. **Th.S.Ranganathan, President, Cauvery Delta Farmers Association, Mannargudi and Expert Member of Research Council emphasised the importance of developing crop varieties based on the stakeholders' acceptability and marketability. Further he opined that coordination of Revenue Department, Public Works Dept. and Department of Agriculture is essential for improving the productivity in Delta region. He requested to focus the research issues for delta region on developing short duration rice varieties (within 100 days), improved package of practices for direct sown rice, alternative cropping pattern by utilizing South West Monsoon during *Kuruvai* season, promoting green manures and varieties responding to such manures, effective post emergence weedicides, promotion of vegetable and fruit crops based cropping system, effective water budgeting with available Cauvery water, eradication of weeds in water canals and rice varieties tolerant to salinity (Director, TRRI, Aduthurai).**

**Improved package of practices for direct sown rice**

<b>Season</b>	Kuruvai and early Samba
<b>Varieties</b>	Short duration varieties : ADT 36, ADT 37, ADT 43 and ADT 45 Long duration varieties : ADT 50, CR 1009, ADT44

<b>Seed rate</b>	35-40 kg/ha
<b>Seed hardening</b>	Seed hardening with 1% KCL is recommended
<b>Sowing date</b>	Sowing date for Kuruvai: May 20 to June 25 Sowing date for Samba: August 10 to September 10
<b>Field preparation</b>	Cultivator ploughings : 2 times fb rotovator ploughing 1 time fb laser-assisted land levelling
<b>Sowing</b>	Tractor drawn seed drill

### **Weed Management**

- Stale seedbed technique
- Pre-emergence herbicides : Pendimethalin at 800-1000 ml/acre on 3 DAS, Pretilachlor at 600 ml/acre on 5-7 DAS
- Post emergence herbicides : Bispyribac sodium at 80-100 ml/acre; 2,4-D Na salt at 500 g/ha

### **Fertilizer management**

The blanket recommendation is 150: 50: 50 kg NPK/ha and zinc sulfate (ZnSO<sub>4</sub>) at 25 kg/ha. Split application of K fertilizer application in splits (50% at sowing, 50% at PI). N fertilizer should be applied in 3-4 equal splits evenly spaced between about 3 weeks after sowing and PI. If Zn is not applied at sowing, it can be applied as a foliar spray (0.5% zinc sulfate plus 1.0% urea) 30 DAS and at panicle initiation (PI)

**Irrigation management:** Alternate wetting and drying

### **Alternate cropping pattern by utilizing SWM rains during Kuruvai season**

Minor millets - Ragi, Thinai, Pulses, Green manure crops is being suggested

### **Promoting green manure crops**

Raising green manure crops viz., Daincha, Sunn hemp, kolingi during summer season to improve the soil fertility and this can be promoted by creating awareness to the stakeholders

### **Effective post emergence herbicides**

#### **Rice**

- Bispyribac sodium at 80-100 ml/acre for controlling broad spectrum of weeds
- 2,4-D Na salt at 500 g/acre for controlling broad leaved weeds
- Almix at 8 g/acre

### **Blackgram**

- Imazethapyr at 300 ml/acre for controlling broad spectrum of weeds
- Quizalofop ethyl at 400 ml/acre controlling grassy weeds

### **Development of Short duration Rice varieties (with in 100 days)**

Efforts are underway at TRRI to generate segregating materials to select genotypes with duration of less than 100 days. During kuruvai 2013, eight crosses were made using Tulasi, ADT (R) 48, MDU 5 and F<sub>1</sub>s are presently under evaluation. Also, 11 varieties with duration of less than 100 days were obtained from CRRRI, Cuttack and have been raised for hybridization.

### **Development of Rice varieties tolerant to salinity**

The work on developing breeding materials for salinity is undertaken at ADAC & RI, Trichy. Two medium duration cultures viz., TR 05043 and TR 05031 are being tested in Adaptive Trials this year. A medium duration variety, TNAU TRY Rice 3 highly suitable for idly making was released during 2010. Its average grain yield is 5833 kg/ha and is moderately tolerant to sodicity.

## **Horticultural Crops**

### **17. Papaya CO 8 has to be analysed for its Glycemic Index in comparison to other entries. (Dept. of Fruit crops, HC&RI)**

For conducting the clinical study of glycemic index, the cost per sample is Rs.20000. Considering the high budget for the study as well as the complications in involving volunteers, the study has been proposed to be taken up in the ensuing year.

### **18. Discussions are to be held with the officials of Sagoserve, Salem for the large scale promotion of YTP-1 Tapioca (TCRS, Yethapur; Dean, HC&RI)**

- Based on the discussions with the officials of SAGOSERVE, farmers training programme on tapioca cultivation and value addition and distribution of planting materials of tapioca variety YTP-1 (Me 833) was organized on 12-12-2013 in the presence of Director of Research, TNAU, CBE, Chairman, SAGOSERVE, President, Attur taluk Starch and Sago Producers Association, State Secretary, Tamil Nadu Starch and Sago producers Association, Salem, and Deputy Director of Horticulture, Salem.
- In addition to the above, the planting materials of the tapioca variety YTP-1 was distributed to the progressive growers in Salem, Namakkal, Erode, Dharmapuri and Pudukottai districts of Tamil Nadu. Planting materials to cover an area of 760 acres were distributed in the last two months.



19. In response to the request to design instrument to assess the starch content of tapioca at the farm gate, it is suggested to procure the instrument already available in the market by the marketing department and facilitate the needy farmers. (TCRS, Yethapur)

The equipment for assessing the starch content of tapioca (by point scale method) has been purchased and the farmers are availing the facility at TCRS, Yethapur.



20. Research focus in the Horticulture has to be retuned wherein two vegetables and two fruit crops can be taken up and the key technologies contributing for upsurge in the yield are to be popularized for follow up by the farmers. (Dean, HC&RI)

### BANANA

**High density planting: Adoption of Robusta, Grand Naine and Ney Poovan**

- Planting three suckers per pit at a spacing of 1.8 x 3.6 m
- Spacing between suckers within each pit is 30cm
- Total number of plants per hectare is 4630

### Fertigation under High Density planting

- Fertilizer dose for three suckers per pit under high density planting is 250:80:745g of NPK/clump
- Use of white potash for good solubility

### Fertigation schedule for banana

Weeks after planting	N (%)	P <sub>2</sub> O <sub>5</sub> (%)	K <sub>2</sub> O (%)
9–18 (10 Weeks)	30	100	20
19-30 (12 weeks)	50	-	40
31-42 (12 weeks)	20	-	32
43-45 (3 weeks)	-	-	8
Total	100	100	100

## MANGO

### High Density Planting

- 5 m x 5 m (400 plants / ha)
- Double hedge row system: Adopting a spacing of 5 m x 5 m within double rows and 10 m between successive double rows (266 plants / ha)

### Fertigation technology under HDP

Application of 1.0:0.5:1.0 kg of NPK / bearing tree / year under HDP through drip fertigation adopting the following schedule:

Nutrient	Stage of application*				Total
	Immediately after harvest (2 months)	Pre-flowering (2 months)	Flowering to fruit set (2 months)	Fruit development (4 months)	
N	25 %	40 %	20 %	15 %	100 %
P	50 %	30 %	20 %	-	100 %
K	25 %	20 %	25 %	30 %	100 %

The above schedule has to be split into six or more doses and applied at weekly intervals.

Avoiding irrigation and fertigation for 30 days for induction of stress before flowering season; resuming irrigation as soon as flowering commences.

- Technology has been transferred to Extension officials, State Department of Horticulture for popularization
- Actual data on area covered is not available

- 21a. **As indicated by the Deputy Directors, Agri. Marketing of Pudukottai and Madurai, utilization of cucumber available in Pudukottai area, Standardizing packaging technology for exporting commodities and promoting recently released rice varieties in Madurai area with the**

help of JDA, Madurai are to be taken up [Special Officer (Seeds), HC&RI (W), Dean, AEC&RI and Director, CPBG]

- 21b. **Potential of the local cucumber, “Namana samudram” variety is to be explored for commercial cultivation and also to the local and export marketing as requested by Deputy Director (Agrl. Marketing), Pudukottai (Action: Dr.T.Balamohan, Special Officer, HC&RI (W), Trichy)**

For promotion of the latest varieties of rice, following quantities of TFL seed is available at different centres of TNAU as follows. The information is made available in agri tech portal.

Varieties	Quantities available (kg)	Place of availability
TPS 5	1000	ARS, Thirupathisaram
Anna 4	2500	ARS, Bhavanisagar
CO 51	2000	
CO 51	2000	SWMRI, Thanjavur
CO 51	950	TRRI, Aduthurai
Anna 4	3000	ARS, Paramakudi

#### **HC&RI (W), Trichy**

The cucumber seeds of potential cultivar viz., Namama samudrasam has been collected through the Deputy Director of Horticulture, Vallathirakkotai and the trial has been initiated in the college orchard to assess its potentiality for the domestic and export market as suggested by the Deputy Director of Agrl. Marketing, Pudukkottai.

22. **Cocoa being suitable intercrop in coconut, value addition of harvested bean useful at the farmer's level is to be explored to increase the income of farmers as suggested by Th.M.D.Ramakrishnan, Expert Member of Research Council (Dean, HSC&RI, Madurai).**

Cocoa beans are the basic feedstock for the chocolate industry. At present, most of the cocoa beans are used in the production of cocoa products such as cocoa butter, cocoa powder, chocolate and chocolate-related products. However, cocoa beans constitute only 10% of the fresh weight of the cocoa fruit. About 10% by weight of the cocoa fruit is commercialized while 90% by weight (mainly cocoa pulp and cocoa pod husk) is discarded as cocoa waste. Keeping the above problem in view a study was conducted to develop value added products from cocoa pulp namely cocoa and millet toffee, wine, juice and marmalade. Organoleptic characteristic of the developed products were done using 9 point hedonic scale. The recorded sensory scores showed that the millet incorporated cocoa toffee secured highest score in terms of colour, flavor, taste and over all acceptability.

**23. A Permanent Pesticide Trial has to be taken up at HC&RI, Periyakulam with the technical guidance and necessary follow up by the Director, CPPS.**

As per the following guidelines of Director, CPPS, a permanent pesticide trial has been initiated with CO 2 Brinjal

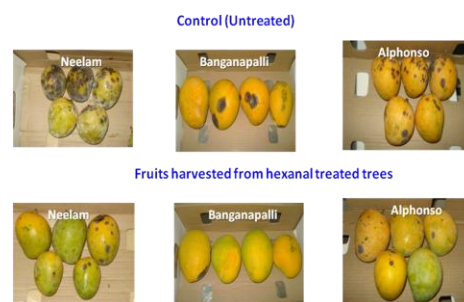
- Following a cropping sequence with brinjal, tomato and bhendi year after year in the same field
- Recording observations on the incidence of pests at periodical intervals and application of chemicals on need basis as per crop production guide
- Assessing the pesticide level in the soil before planting and at the time of harvest of each crop
- Assessing pesticide level in harvested products at each picking

**24. To meet the demand of the packing technology proposed by the Deputy Director (Marketing), packaging mango especially for choice varieties (Alphonso) for the purpose of export needs to be improved (Dean, AEC&RI, CBE) and offer training to the marketing personnel of Dept. of Agri. Marketing. (Dean, AEC&RI, CBE)**

To extend the shelf-life, mangoes (variety Alphonso, Bangalora, Banganapalli and Neelum) were treated with Hexanal (a C-6 aldehyde naturally occurring compound), in vapor and liquid form, which inhibits the PLD activity and in turn retards the ripening. Provisions are being made to incorporate the hexanal in the carton box for slow release of hexanal. Concentration of hexanal has to be optimized. Release studies of hexanal are in progress.



Hexanal Spray in Mango Orchards



Hexanal on Shelf-life of Fruits under Cold Storage



## Hexanal on Shelf-life of Fruits

Varieties	Control		Treated	
	Ambient	Cold	Ambient	Cold
Alphonso	7.5	18.2	12.5	22.2
Banganapalli	12.2	19.8	15.5	25.7
Bangalora	6.0	11.5	13.0	21.5
Neelum	6.3	11.3	12.0	19.5
Himampasand	12.3	15.2	14.5	19.3

Hexanal formulation extended the shelf-life of mango fruits to the tune of 3-5 days (ambient) and 4-12 days (cold) storage conditions.

## Agricultural Engineering

### 25. Feasibility of utilizing the turmeric harvester with minimum changes for harvesting the groundnut can be explored (Dept. of Farm Machinery / AMRC, Dean, AEC&RI)

- The tractor drawn turmeric harvester was developed with digging blades and penetrating rods which can able to perform digging operation only. Before harvesting, the turmeric crop is detopped manually and the rhizomes are being dug by the turmeric harvester. But, in groundnut, the entire plant has to be harvested.
- Further, the spacing between rows for turmeric and groundnut are 45 and 30 cm, respectively. The depth of penetration required for harvesting turmeric rhizomes is around 5-7 inches whereas it is 3-4 inches for groundnut.
- Preliminary trial conducted for harvesting groundnut with turmeric harvester indicated non-suitability of turmeric harvester for groundnut harvesting.

### 26. For Agri. Implements, instead of emphasizing on low cost, weight reduction as well stress reduction can be thought of (Dean, AEC&RI)

Prototype machinery developed under research are being evaluated for its ergonomical and safety measures under AICRP on Ergonomics and safety in Agriculture Scheme, Dept. of Farm Machinery. The four row drum seeder, ergo refined coconut tree climber, ergo refined cono weeders were developed in the scheme by the reduction of weight and material substitution.

### 27. Demonstration plots with 100 per cent mechanization (from seed to seed) may be planned involving Breeders and the Agronomists for rice and some of the garden land crops (Dean, AEC&RI, Kumulur)

## **Rice**

- New scheme entitled “Mechanization in rice based farming to enhance rice productivity in Cauvery delta zone” was obtained from NABARD with the budget of 1.71 lakh for implementing the above recommendation.
- Under NABARD scheme, State Level Demonstration cum Exhibition on “Complete Mechanization in Rice cultivation from Seed to Seed” was conducted on 18.10.2013 with 1500 farmers and Department Officials of Agriculture and Agricultural Engineering of Delta Districts at Agricultural Engineering College and Research Institute, Kumulur. A Model Mechanized Rice Farm of 40 acres was established. The following technologies were demonstrated.

## **Farm Machinery**

- Seeder-Tractor drawn seed drill
- Tractor drawn turbo seeder
- Paddy drum Seeder
- Transplanter – Walking behind - 4 row rice transplanter
- Riding type - 8 row (Single wheel drive)
- Riding type - 8 row (Four wheel drive)
- Two row paddy power weeder
- Three row paddy power weeder
- Single row cono weeder
- Tractor operated laser leveler
- Tractor drawn dry land leveler
- Tractor drawn wetland leveler
- Automatic nursery seeding machine

## **Irrigation and micro irrigation**

- Irrigation cafeteria with automatised irrigation system
- Drip and Sprinkler for rice
- Sprinkler and raingun for dryland supplemental irrigation
- Rice water management (sallow submergence with alternate wetting and drying)
- Two field days were conducted on farm mechanization on 21.12.2013 and 22.01.2014 with the assistance of NABARD.
- Data on water use efficiency, labour saving, cost incurred, weed intensity, pests incidence, nutrient required, yield and cost benefit ratio were calculated.

## **Gardenland crops**

- Crops like maize (CO 6), blackgram (CO 6), minor millets (samai CO4, varagu CO 3, ragi CO 14), redgram (CORG 7) were grown with crop management techniques (seed treatment with biofertilizer and micronutrients) using supplemental sprinkler irrigation from separately designed farm pond water through rain water harvesting.

## Rice Mechanization - Demonstration plot

The mechanization demonstration plot for rice crop was established at TNAU Wetlands in an area of 4 acre by AMRC, AEC&RI, Coimbatore in collaboration with M/s.Escorts Limited, Faridhabad. Demonstration of rice machineries viz., automatic tray seeder for raising nursery, roto puddler, wet leveller, ride on paddy transplanter, power weeder and Head feed combine harvester were carried out.



Tray nursery was raised using the automatic tray seeder for ADT 43, TKM 9 and NLR1 varieties of paddy. The main field was prepared with tractor drawn roto puddler and wet leveller.

Transplanting of paddy seedlings at different row spacings viz., 30 x 12 cm, 30 x 14 cm; 30 x 16 cm and 30 x 18 cm was carried out with Duo 60 model ride on 6 row paddy transplanter.



Weeding in the paddy crops was carried out using three row and five row power weeders.

The crop was harvested with K10TI model Head feed combine harvester. After harvest, the paddy straw comes out of the machine is uncrushed and hence best suited for feeding the cattle.

**List of machineries used in mechanization of rice demonstration plot**

Name of the Machine	Power source	Purpose	Coverage
Roto puddler	Tractor > 55 hp	Puddling	3.2 ha/day
Rotovator + Wet leveller	Tractor > 55 hp	Puddling & Levelling	3.2 ha/day
Automatic tray seeder	Electric driven	Sowing seeds in trays	400-500 trays/h
Transplanter	14.7 hp petrol engine	Transplanting in 6 rows	2.4 – 3.2 ha/day
Power weeder	2 hp petrol engine	Weeding in 3 / 5 rows	1.2 – 1.6 ha/day
Combine harvester	72 hp diesel engine	Harvesting & Threshing	3.2 ha/day

- 28. Scientists from FC&RI and AEC&RI can have discussions on sustainable use of biomass for energy generation. (Dean, FC&RI, Mettupalayam/AEC&RI, Coimbatore)**

The following proposals/projects to the various funding agencies for implementation are submitted.

- Bioenergy mission 2014 for Tamil Nadu has been submitted to State Planning Commission, Govt. of Tamil Nadu.
- A project proposal on “Demonstration of biomass based pilot power plant for production of green electricity” has been submitted to State Planning Commission, Govt. of Tamil Nadu as a part of Part II schemes with a budget of 2.95 crores.
- Project proposal on “Niche Area of Excellence in New and Renewable Sources of energy” has been submitted to ICAR with a budget of Rs.450 lakhs.
- Project proposal on “Biorefineries- New concept for economic utilization of biomass” has been submitted to NADP with a budget of 10 crores.

**Home Science**

- 29. Natural dyeing materials for the apparels are to be identified and test verified for their suitability and acceptability (Dept. of Apparels, HSC & RI, Madurai)**

Fibre from banana, a by product is used in composites and in upholstery, carpets, mats, heat proof linings and handicrafts. Much of it is also exported; hence application of natural dye was tried for value addition. The pretreatments such as scouring, bleaching and premordanting of the banana fibre was carried out using standard procedures. Different dye sources such as khair bark (black), adathoda leaves (light green), marigold flower, pomegranate peel, onion peel, tea leaves, turmeric powder, madder root (copper red), myrobalan flower (yellow) and chavalkodi (pinkish orange) were tried out. Out of these, the best sources and their mordants were selected for dye extraction. The dye extracts were made up to 18 litres and the banana fibre (600) was boiled for 40 min. The dyed fibre was dried, washed in water and sun dried again. The following colors were obtained and the dyed fibres were tested for colour fastness.



## CARDS

30. National Biodiversity Board has already formulated strategy for providing incentives to the farmers involved in providing eco-system services. CCPC staff available in the Directorate of CARDS can be employed to collect the details and to arrive values for such services (Director, CARDS)

The matter was discussed with the economist working at the National Biodiversity Authority. In addition, Dr.K.R.Ashok. Professor of Agrl. Economics attended a meeting at the National Biodiversity Authority, Chennai on December 9-10, 2013 regarding the valuation of bioresources.

The National Biodiversity Authority is mandated to regular use of India's biological resources; facilitates/enable conservation action and provides advice to Central and State Government on issues of conservation, sustainable use and access and benefit sharing. The National Biodiversity Act is only concerned with the exploitation utilization. It is mandatory for the concerned firms/individuals, who exploit the bioresources for commercial purpose, to pay a fee to the NBA which will be shared with local Biodiversity Management Committee/local communities. In such cases, the NBA itself is taking steps to estimate the value of the bioresources. However, NBA is not concerned with the issue of ecosystem services provided to the farmers and NBA is still in the process of working out an appropriate methodology for valuation for bio-resources for access and benefit sharing. In view of these facts, it is submitted that a study on valuation of ecosystem services provided by farmers using farm survey is considered not necessary at this stage.

**31. Strengthening market oriented research is to be given priority (Director, CARDS)**

The Domestic and Export Market Intelligence Cell (DEMIC) continue to undertake price forecasting for various agricultural commodities. The outreach of the forecasts has been continuously enhanced through various mass media as well as through mobile phones.

A research project entitled "Measurement of inclusiveness of the value chains through development of an index of inclusiveness in South Asia: Case study on pearl millet for poultry feed value chain and the value chain of chickpea in Tamil Nadu and Andhra Pradesh" has been taken up with financial support from the International Crops Research Institute for Semi-Arid Tropics (ICRISAT), Hyderabad.

**32. Effective marketing channel and market for Thorny brinjal (*Mullukathiri*) for Dharmapuri farmers need to be worked out (Director, CARDS)**

A study on this issue will be taken up and completed within 3-4 months.

## General

- 33. Uploading of Annual Reports of TNAU of 2011 and 2012 has to be completed at the earliest. Linking of the reports hosted in the Agritech portal to the Main page is to be made (Director, Planning and Monitoring)**

TNAU Annual Report 2011-12 placed in the Tamil Nadu Assembly has been uploaded in the TNAU Agritech portal and Annual Report 2012-13 will be uploaded after placing on the table of the Tamil Nadu Legislative Assembly.

- 34. NARP status reports are to be updated (Director of Research)**

For all the seven agro climatic zones, lead centre were addressed on 4.7.2013 to add up the details. The latest report updated till 2000-2001 was circulated for abridging the contents. A remainder was sent on 10.2.2014 to update the contents. Updated content will be soon made available in TNAU website.

- 35. All the scientists can be informed to look into the various research platforms and mega research programmes proposed by ICAR for the XII Plan period to propose suitable research projects (Director of Research)**

### Research proposals for external funding

- As much 50 projects intended for submission to external funding agencies (UGC- 35 Nos., DBT 10 Nos, Coconut Development Board -1 No and TNSCST- 4 Nos) were scrutinized by the Project Proposal Scrutinizing Committee (PPSC) and recommended valid projects with improvements for submission to the UGC and DBT (Tables 2a & 2b) concerned. All the projects proposed for external funding in the PPSC convened at weekly interval in this Directorate. In order to facilitate screening the large number projects in a short available time, the PPSC met at AC&RI Madurai as a special case on 23.10.2013 to screen the projects proposed by the scientists working in Southern Region.
- A communication in this regard was sent to all the scientists. A substantial number of research proposals under National Fund for Basic, Strategic and Frontier Application Research in Agriculture (NFBSFARA) & National Food Security Mission (NFSM) were sent (Tables 3a & 3b). Three proposals under NFSM and one under NFBSFARA are under consideration.

### **Approved proposals under NFSM**

1. Optimization of seed storage techniques for rice and blackgram in coastal areas of Tamil Nadu – Rs.115 lakhs
2. Adaption of machineries for millet mechanization – Rs.59.40 lakhs
3. Post harvest processing and value addition of selected cereals & pulses – Rs.99.57 lakhs

### **Approved concept note under NFBSFARA**

1. Lignin derived aromatic chemicals: Novel biocatalysts for bioconversion high biomass lignin / biorefinery waste into value added products – Rs.250 lakhs



**Table 1a. Quality parameters of MLT I cultures, 2012-13**

Entries / Characters	Hulling (%)	Milling (%)	Head rice recovery (%)	Kernel length (mm)	Kernel breadth (mm)	L/B ratio	Kernel length after cooking (mm)	Kernel breadth after cooking (mm)	Linear elongation ratio	Breadth wise elongation ratio	Volume expansion ratio	Gel consistency (mm)	Alkali spreading value	Amylose content %
AD (Bio) 09505	73.00	63.00	61.08	5.50	2.10	2.60	8.90	2.90	1.62	1.38	5.00	80.00	3.00	27.10
ACK 09013	76.00	60.40	53.38	5.20	1.90	2.70	8.50	2.60	1.63	1.37	5.00	70.00	4.00	20.50
CB 08 721	78.80	70.00	64.74	5.50	1.90	2.80	8.90	2.30	1.62	1.21	5.00	70.00	2.00	24.50
TM 07335	80.80	70.40	63.98	5.20	1.90	2.70	8.50	2.60	1.63	1.37	5.00	98.00	3.00	21.40
ACK 09008	86.40	60.80	52.70	5.50	1.80	3.00	9.40	2.70	1.71	1.50	5.00	61.00	2.00	20.80
AS 10008	71.20	63.60	54.48	5.30	2.00	2.60	8.90	2.70	1.68	1.35	4.50	65.00	3.00	18.90
CB 09538	76.80	72.60	66.83	5.90	1.90	3.10	9.60	3.00	1.63	1.58	4.20	62.00	2.00	20.30
CB 09570	75.20	72.00	67.68	5.50	1.80	3.00	9.40	2.70	1.71	1.50	4.40	80.00	3.00	25.60
TM 09 086	66.90	63.60	55.05	4.60	1.80	2.50	7.50	2.40	1.63	1.33	4.20	90.00	2.00	24.80
ADT (R ) 45	72.50	60.00	51.00	6.00	2.00	3.00	8.90	2.90	1.48	1.45	4.00	82.00	4.00	23.70
ASD 16	74.50	59.00	50.20	5.40	2.40	2.20	9.50	3.74	1.75	1.54	4.00	98.54	5.00	24.90

**Table 1b. Quality parameters of MLT II cultures, 2012-13**

Entries / Characters	Hulling (%)	Milling (%)	Head rice recovery (%)	Kernel length (mm)	Kernel breadth (mm)	L/B ratio	Kernel length after cooking (mm)	Kernel breadth after cooking (mm)	Linear elongation ratio	Breadth wise elongation ratio	Volume expansion ratio	Gel consistency (mm)	Alkali spreading value	Amylose content (%)
ACK 09009	76.80	62.00	51.20	4.90	1.90	2.50	8.00	2.90	1.63	1.53	5.00	75.00	4.00	24.20
AD 09391	75.80	61.00	52.00	5.20	1.80	2.89	9.30	2.90	1.79	1.61	4.90	65.00	3.00	20.80
AD (Bio) 09509	76.50	62.00	55.90	5.40	1.90	2.84	8.90	2.80	1.65	1.47	5.10	63.00	2.00	24.90
ACK 10002	75.60	60.30	50.08	4.90	2.00	2.40	7.80	2.40	1.59	1.20	5.00	82.00	4.00	25.20
AS 10015	79.20	67.20	58.36	5.10	2.10	2.40	8.50	2.60	1.67	1.24	5.20	85.00	4.00	19.00
CB 09526	74.00	66.30	54.00	5.80	1.60	3.60	8.40	2.20	1.45	1.38	5.10	75.00	2.00	23.20
CB 10528	73.20	69.20	57.20	5.90	1.80	3.20	9.50	2.80	1.61	1.56	5.10	80.00	2.00	21.10
TM 10158	80.40	69.60	54.30	5.10	1.80	2.70	8.30	2.40	1.63	1.33	5.20	100.00	2.00	18.80
ASD 16	77.50	62.50	54.80	5.50	2.20	2.50	9.20	3.50	1.67	1.59	4.80	80.00	3.00	23.20
ADT 39	72.50	62.50	54.30	5.10	1.80	2.80	8.60	2.50	1.68	1.38	5.00	84.00	3.00	22.40

**Table 1c. Quality parameters of MLT III cultures, 2012-13**

Entries / Characters	Hulling (%)	Milling (%)	Head rice recovery (%)	Kernel length (mm)	Kernel breadth (mm)	L/B ratio	Kernel length after cooking (mm)	Kernel breadth after cooking (mm)	Linear elongation ratio	Breadth wise elongation ratio	Volume expansion ratio	Gel consistency (mm)	Alkali spreading value	Amylose content (%)
AD 07 260	72.00	61.60	50.30	5.10	2.00	2.50	8.60	3.10	1.69	1.55	4.00	80.00	2.00	20.80
AD 09442	76.00	64.80	51.90	5.20	1.90	2.70	7.90	3.20	1.52	1.68	4.20	60.00	4.00	20.60
CB 09 161	72.00	64.40	58.90	5.20	2.00	2.60	9.10	3.10	1.75	1.55	4.80	90.00	4.00	24.20
ADT (R) 46	87.50	72.50	54.40	6.90	2.10	3.20	11.20	3.10	1.62	1.47	4.00	92.00	5.00	22.10
CO ( R ) 50	85.00	60.00	55.20	6.00	2.20	2.70	9.60	3.10	1.60	1.40	4.30	91.00	5.00	23.00

**Table 1d. Quality parameters of MLT IV cultures, 2012 - 13**

Entries / Characters	Hulling (%)	Milling (%)	Head rice recovery (%)	Kernel length (mm)	Kernel breadth (mm)	L/B ratio	Kernel length after cooking (mm)	Kernel breadth after cooking (mm)	Linear elongation ratio	Breadthwise elongation ratio	Volume expansion ratio	Gel consistency (mm)	Alkali spreading value	Amylose content (%)
AD 07 250	78.40	69.20	65.20	5.50	2.40	2.20	7.90	3.00	1.65	1.22	4.00	63.00	5.00	25.2
AD 09 348	74.80	64.00	56.00	5.50	2.10	2.60	8.40	2.70	1.53	1.29	4.20	85.00	5.00	21.3
CB 09 367	74.00	66.80	61.20	5.50	2.00	2.70	9.20	3.00	1.67	1.50	4.20	65.00	3.00	23.6
CB 09 154	76.40	64.80	56.80	5.40	2.30	2.30	8.30	2.60	1.54	1.13	4.00	85.00	4.00	21.2
CR 1009	73.50	63.50	49.50	5.30	2.70	1.90	8.20	3.30	1.55	1.22	4.00	114.00	5.00	20.80
CO R 50	75.00	60.00	55.20	6.00	2.20	2.70	9.60	3.10	1.60	1.40	4.30	91.00	5.00	23.00

**Table 1e. Quality parameters of MLT Quality rice - Early cultures, 2012 - 13**

Entries / Characters	Hulling (%)	Milling (%)	Head rice recovery (%)	Kernel length (mm)	Kernel breadth (mm)	L/B ratio	Kernel length after cooking (mm)	Kernel breadth after cooking (mm)	Linear elongation ratio	Breadthwise elongation ratio	Volume expansion ratio	Gel consistency (mm)	Alkali spreading value	Amylose content (%)
AD 07073	74.40	60.00	52.80	5.30	1.80	2.90	8.70	3.40	1.64	1.89	4.20	88.00	4.00	24.70
AS 10024	76.50	60.30	52.00	5.00	2.00	2.50	8.90	2.50	1.78	1.25	4.20	50.00	5.00	21.40
TM 07030	72.00	60.80	58.80	4.80	1.90	2.50	7.20	2.40	1.50	1.26	4.00	95.00	3.00	19.70
AD 09219	63.60	55.00	50.80	5.50	1.90	2.80	8.60	2.80	1.56	1.47	4.20	62.00	4.00	25.10
AD (BIO) 09518	71.20	63.20	58.00	5.30	1.90	3.00	8.40	2.20	1.58	1.16	4.00	30.00	3.00	25.60
ACM 09007	76.80	61.20	50.64	5.10	1.80	2.80	8.20	2.80	1.61	1.56	4.20	55.00	4.00	19.20
CB 10 510	76.40	62.40	55.00	5.90	1.90	3.10	8.80	2.50	1.49	1.32	4.20	65.00	3.00	20.70
CB 10 553	73.20	60.40	58.00	5.50	1.80	3.00	8.70	2.30	1.58	1.28	4.00	45.00	3.00	23.50
TM 10 110	77.20	66.40	57.56	6.50	1.90	3.40	10.90	3.10	1.55	1.32	4.60	98.00	5.00	26.30
ADT 43	79.50	70.80	64.30	5.58	1.20	2.90	9.88	1.92	1.77	1.60	5.00	93.00	4.00	20.60

**Table 1f. Quality parameters of MLT Quality rice - Medium cultures, 2012 -13**

Entries / Characters	Hulling (%)	Milling (%)	Head rice recovery (%)	Kernel length (mm)	Kernel breadth (mm)	L/B ratio	Kernel length after cooking (mm)	Kernel breadth after cooking (mm)	Linear elongation ratio	Breadthwise elongation ratio	Volume expansion ratio	Gel consistency (mm)	Alkali spreading value	Amylose content (%)
AD 08 132	72.30	62.30	58.30	5.40	1.90	2.80	8.70	2.80	1.61	1.47	4.20	62.30	3.00	23.20
CB 09 123	73.00	50.50	51.60	5.50	1.80	3.00	8.10	2.60	1.47	1.44	4.60	60.00	2.00	21.10
AD 06 207	78.80	67.60	66.40	6.00	1.90	3.10	9.60	2.90	1.60	1.53	4.30	95.65	3.00	19.50
AD 08 142	75.70	62.30	51.60	5.40	1.90	2.80	8.70	2.80	1.61	1.47	4.00	80.00	4.00	25.20
CB 07 540	77.60	66.40	61.20	5.30	2.00	2.60	8.30	2.50	1.57	1.25	4.20	98.30	3.00	21.30
CB 11 533	74.80	62.40	60.40	5.10	1.70	3.00	7.60	2.40	1.49	1.41	4.20	50.00	4.00	20.50
TM 10 149	76.80	62.00	56.00	5.40	1.80	3.00	7.90	2.40	1.46	1.33	4.10	60.00	2.00	19.80
CO (R ) 49	81.00	63.00	50.40	5.70	2.10	2.70	9.30	3.10	1.63	1.48	4.20	87.00	4.00	23.25
BPT 5204	79.50	65.00	58.50	5.50	2.00	2.70	9.80	2.80	1.78	1.40	4.10	93.00	4.00	23.50
ADT R 49	82.4	72.6	61.3	5.7	1.8	3.2	9.4	2.5	1.65	1.39	5.1	67	3	21.50

**Table 1g. Quality parameters of MLT hybrid rice - Early cultures, 2012 - 13**

Entries / Characters	Hulling (%)	Milling (%)	Head rice recovery (%)	Kernel length (mm)	Kernel breadth (mm)	L/B ratio	Kernel length after cooking (mm)	Kernel breadth after cooking (mm)	Linear elongation ratio	Breadthwise elongation ratio	Volume expansion ratio	Gel consistency (mm)	Alkali spreading value	Amylose content (%)
TNRH 243	80.80	78.20	58.60	6.90	1.90	3.60	9.20	2.80	1.33	1.47	4.40	65.00	4.00	24.20
TNRH 280	78.80	63.60	60.30	6.00	1.80	3.30	8.90	2.70	1.48	1.50	4.10	72.00	5.00	20.10
CORH 3	80.00	67.50	54.00	6.00	2.00	3.00	9.70	2.80	1.54	1.35	4.00	85.00	5.00	21.80
ADT 45	72.50	60.00	51.00	6.00	2.00	3.00	8.90	2.90	1.48	1.45	4.00	82.00	4.00	23.70

**Table 1h. Quality parameters of MLT hybrid rice - Medium cultures, 2012 - 13**

Entries / Charactera	Hulling (%)	Milling (%)	Head rice recovery (%)	Kernel length (mm)	Kernel breadth (mm)	L/B ratio	Kernel length after cooking (mm)	Kernel breadth after cooking (mm)	Linear Elongation Ratio	Breadth wise elongation ratio	Volume expansion ratio	Gel consistency (mm)	Alkali spreading value	Amylose content (%)
TNTRH 33	81.60	71.60	60.80	6.40	2.00	3.20	8.60	2.70	1.34	1.35	4.40	65.00	3.00	23.50
TNTRH 37	84.00	64.40	58.00	6.10	2.00	3.10	8.20	2.90	1.34	1.45	4.60	72.00	5.00	21.90
TNTRH 39	82.40	62.40	55.60	6.00	2.00	3.00	8.00	2.70	1.33	1.35	4.40	68.00	4.00	24.30
TNRH 241	79.20	64.40	60.40	5.90	1.90	3.10	8.90	2.60	1.51	1.37	5.00	70.00	3.00	23.10
TNRH 253	81.60	60.40	59.20	6.40	1.80	3.50	8.60	2.90	1.34	1.61	4.60	65.00	5.00	23.50
CO R 50	75.00	60.00	55.20	6.00	2.20	2.70	9.60	3.10	1.60	1.40	4.30	91.00	5.00	23.00
TNAU Rice hybrid CO4	74.30	68.60	62.50	5.67	1.78	2.96	9.50	3.20	1.68	1.80	5.20	65.2	5.00	24.01

**Table 1i. Quality parameters of MLT Saline/Alkaline cultures, 2012 - 13**

Entries / Characters	Hulling (%)	Milling (%)	Head rice recovery (%)	Kernel length (mm)	Kernel breadth (mm)	L/B ratio	Kernel length after cooking (mm)	Kernel breadth after cooking (mm)	Linear elongation ratio	Breadth wise elongation ratio	Volume expansion ratio	Gel consistency (mm)	Alkali spreading value	Amylose content (%)
ACK 09002	80.00	65.00	53.30	6.20	1.70	3.60	9.30	2.80	1.50	1.64	4.20	67.00	5.00	22.50
TR 09030	73.50	62.30	54.10	6.30	2.00	3.10	9.40	2.60	1.50	1.30	4.00	72.00	4.00	22.10
TRY 1	78.50	73.00	53.50	5.90	2.30	2.60	10.20	3.40	1.73	1.48	4.30	79.00	5.00	23.10
TRY (R ) 3	79.30	70.50	58.30	5.90	2.70	2.20	8.30	3.50	1.41	1.30	4.10	98.20	5.00	22.50

**Table 2a. Projects proposed for UGC, New Delhi**

<b>S. No</b>	<b>Title of the project</b>	<b>PI &amp; Co-PIs</b>	<b>Amount (Rs. in lakhs)</b>
1.	Developing rice lines with delayed senescence for enhancing photosynthesis during drought episodes by increasing endocytokin levels	Dr.A.Senthil Dr.P.Boominathan Dr.A.Arul, TNAU, Coimbatore	22.17
2.	Molecular tagging of MYMV resistant gene in greengram ( <i>Vigna radiata</i> (L.) Wilczek)	Dr.S.Chitra Dr.S.K.Ganesh, ADACRI, Trichy Dr.P.Nagarajan , TNAU Coimabtoe	19.85
3.	Establishing the genetics of false smut resistance in rice based on association mapping	Dr.R.Suresh Dr.R.Saraswathi Dr.K.Karunanithi, TRRI Aduthurai	19.85
4.	Exploiting rice mutants for improving photosynthetic capacity and water use efficiency	Dr.V.Ravichandran Dr.S.Robin Dept of Rice, TNAU, Coimbatore	19.30
5.	Collection characterization development of organic seed production technique and establishment of seed bank for national rice varieties of Tamil Nadu	Dr.J.Renuga Dr.R.Jerlin Dr.K.Sakthivel VRS, Palur	20.27
6.	Diversity of mites associated with honeybee species and Eco-friendly management of parasitic mites infesting Indian and Italian Honeybees in Tamil Nadu	Dr.V.Radhakrishnan, RRS Vridhachalam Dr.K.Ramaraju, TNAU Coimbatore	17.72
7.	Effect of $\alpha$ -tomatine as grain protectant under domestic storage against storage insects	Dr.R.K.Murali Baskaran Dr.R.Nalini Dr.J.Jayaraj Dr.N.Muthukrishnan ACRI, Madurai	16.69
8.	Standardization of mass-culturing techniques of predatory lycaenid butterfly for suppression of mealybugs of crops	Dr.R.K.Murali Baskaran Dr.N.Muthukrishnan Dr.J.Jayaraj Dr.K.Premalatha ACRI, Madurai	18.35
9.	Developing ecological engineering cropping methods to enhance entomophages and increasing pest suppression on medium duration rice variety of Tamil Nadu	Dr.N.Muthukrishnan Dr.R.Nalini Dr.R.K.Muralibasakaran Dr.C.Chinnusamy	19.93

10.	PGPR mediated resistance against major diseases in Indian barnyard millet ( <i>Echinochloa frumentacea</i> (Roxb.) Link	Dr.M.Paramasivam, DARS Chettinad Dr.G.Karthekeyan Dr.P.Arunachalam	16.00
11.	Carbon sequestration potential of bio-fuels and industrial wood species	Dr.K.B.Sujatha Dr.C.Buvaneswaran Dr.K.T.Parthiban	20.00
12.	Studies on the diversity of endophytic bacteria in pulses and to exploit them as bio-inoculants-2	Dr.R.Tamizh Vendan Dr.D.Balachandar	19.92
13.	Exploration of microbial diversity in Nilgiri Shola forest and development of microbial consortia of efficient regeneration of Shola tree species	Dr.M.Tilak Dr.P.Hemalatha Dr.A.Balasubramanian	19.95
14.	Mitigation of methane emission through enhanced methane oxidation and rhizosphere engineering under rice eco-systems	Dr.M.Maheswari Dr.P.Duraisamy	25.64
15.	Formulation optimization of neem oil self-emulsifying preparation for insect pest management	Dr.K.Senthil Dr.Y.S.Johnson Thangaraj Edward Dr.B.Janaki Dr.M.Saravanakumar	20.90
16.	Effect of biochar application on soil carbon sequestration and nitrogen utility in rainfed crops	Dr.P.Kannan Dr.R.Anantham Dr.J.Prabhakaran	16.05
17.	Empowering farm women to achieve environmental and livelihood security in the southern agro climatic zone of Tamil Nadu	Dr.C.Umameswari Dr.D.Jawahar Dr.M.Rajeswari	19.90
18.	Optimal deficit irrigation strategies for groundnut under water scarcity	Dr.V.Kumar Dr.R.Vijayalakhshmi	19.99
19.	GIS based assessment of biomass potential and establishment of bioenergy atlas of selected districts of Tamil Nadu	Dr.P.Subramanian Dr.P.Venkatachalam Dr.Balaji Kannan Dr.A.Kamaraj	19.88
20.	Impact of climate variability in hill vegetable farming: An economic analysis	Dr.S.Varadharaj Dr.R.Balasubramanian Dr.T.Saraswathi Dr.M.Chinnadruai Dr.K.R.Ashok	8.09
21.	A multidimensional study of gender budgeting among three tiers of Panchayat set up in Madurai District of Tamil Nadu	Dr.M.Rama subramanian Dr.S.Parvathi Dr.B.Parthipan Dr.M.Jegadeesan	12.95
22.	Enhancement of livelihood status of tribal women through capacity building by profitable utilization of nonwood forest products (NWFPs)	Dr. P. Balasubramanian Dr. D. Malathi Dr. Cinthia Fernandaz	15.15

23.	Production of natural colours from microorganisms and its feasibility for food applications	Dr.R.Saravanakumar Dr.S.Kanchana Dr.M.Sundar Dr.S.Amutha	9.36
24.	Assessment and sensitization on food safety among street vendors in Tamil Nadu	Dr.S.Arokiamary Dr.T.Padmini Dr.R.Vijayalakshmi	20.01
25.	Development of technology for resistant millet starch and exploring the potential for application in development of low glycemic functional foods	Dr.M.Illamaran Dr.G.Pushpa Dr.S.Kanchana Dr.G.Hemalatha	16.58
26.	Development of nutrient dense fortified bean paste and powder from underutilized pulses	Dr.G.Puspha Dr.G.Hemalatha Dr.S.Kanchana Dr.M.Illamaran	19.80
27.	Community survey on agricultural water riparian rights equity and consequences of water transfer on ecosystem livelihood and health in Mullaiperiyar basin	Dr.A.Malaisamy ACRI Madurai	19.45
28.	Assessing the vulnerability of marginal and small farmers to climate change in drought-prone areas of Tamil Nadu	Dr.V.Saravanakumar Dr.R.Balasubramanian TNAU Coimbatore	14.98
29.	An economic analysis on rural women participation in MGNREOS and its impact on rural households in different production environment of Tamil Nadu	Dr.M.Thilagavathi	10.92

**Table 2b. Projects proposed for DBT, New Delhi**

S.No.	Project title	Proposer	Amount (Rs.)
1.	Marker assisted breeding for developing early maturing versions of popular rice varieties of Tamil Nadu	Dr. R.Sudhagar Dr. S.Robin Dr. M.Raveendran	23.28
2	Introgression of <i>eui</i> gene from maintainer line into cytoplasmic male sterile line of commercial rice hybrid through marker assisted back cross breeding	Dr. S. Manonmani Dr. S. Robin	23.44
3	Development of acyanogenic fodder types through functional marker assisted breeding in <i>Sorghum bicolor</i> (L. Monech)	Dr.A. John Joel Dr. S. Ganesh Ram Dr. C.Babu	44.76
4	Marker assisted introgression of QTLs controlling heat tolerance related traits into elite rice genotypes of Tamil Nadu for adaptation to climate change	Dr. D. Vijayalkshmi Dr.M.Raveendran Dr. S.Robin	26.399

5	Development of shoot fly resistant sorghum varieties suitable for Tamil Nadu through marker - assisted selection	Dr.N. Kumaravadivel	35.00
6	Mapping QTLs for beta carotene in pearl millet [ <i>Pennisetum galauicum</i> (L) R. Br.) ]	Dr. P. Sumathi Dr. N.Senthil Dr. S.Vellaikumar	42.36

**Table 3a. National Fund for Basic, Strategic and Frontier Application Research in Agriculture (NFBSFARA) 2013-14**

**Concept notes submitted**

Sl.No.	Project proposed (priority area)	PI	Budget (Rs. in lakhs)
1.	Whole genome sequencing of medicinal rice genotypes and identification of QTLs for Biofortification of rice	Dr. M. Raveendran Professor, Dept. of Biotechnology, TNAU, Coimbatore	1060.00
2.	Synthesis and evaluation of chemical sterilants for induction of male sterility in rice	Dr.K.Senthi Asst. Prof., Dept. of Agrl. Entomology, TNAU, Coimbatore	426.00
3.	Evaluating the traditional rice cultivar seeragasamba ( <i>Oryza sativa</i> L.) and its cross derivatives for medicinal properties and aroma nature.	Dr.M.Madhan Mohan, Asst. Prof. (PB&G), ARS, Vaigai dam	50.00
4.	Developing and augmenting microbial consortium to alleviate the biotic and abiotic stresses imposed on high value vegetable crops cultivated under controlled conditions	Prof. & Head, Dept. of Agrl. Microbiology AC&RI, Madurai	222.20
5.	Isolation and characterization of phytochemicals from <i>Gloriosa superba</i> and evaluating its antioxidant and medicinal value	Dr.K.Chandrakumar, Asst. Prof., Dept. of Soil and Environment AC&RI, Madurai	215.00
6.	Integrating eco-friendly technologies for holistic management of rice yellow stem borer and leaf folder by fortifying stress adapted biocontrol agent deployment	Dr.R.K.Murali Baskaran, Prof., Agrl. Entomology AC&RI, Madurai	472.80
7.	Breeding for drought resilience in rice: Genetic enhancement of root system architecture	Dr.R.Chandra Babu Director, CPMB TNAU, Coimbatore	1000.00
8.	Nano-based conditioners to sustain soil moisture status and augment productivity of rainfed pulses	Dr.K.S.Subramanian, Professor NS&T, TNAU, Coimbatore	459.00



9.	Development of rapid and non destructive method for quality estimation and certification of selected spices and plantation crops using Near Infrared Reflectance Spectroscopy (NIRS)	Dr.R.Viswanathan, Prof. (Agrl. Process) PHTC, TNAU, Coimbatore	350.00
10.	Lignin derived aromatic chemicals: Novel biocatalysts for bioconversion high biomass lignin / biorefinery waste into value added products	Dr.U.Sivakumar, Professor, Dept. of Agrl. Microbiology, TNAU, Coimbatore	250.00
11.	Bio-economic modelling of dynamic interaction between climate change, environmental degradation and agricultural production	Dr.R.Balasubramanian Prof. & Head Dept. of Agrl. Econ., TNAU, Coimbatore	220.00
12.	Scientific validation of traditional and under exploited medicinal plants and their exploitation for secondary metabolites	Dr.L.Nalina Asst. Prof. (Hort.) Dept. of Med. & Aromatic Crops, HC&RI, Coimbatore	300.00
13.	Utilization of agricultural biomass for extraction of fibers for textiles	Dr.T.Padmini, Prof. & Head, Dept. of Apparel Designing and Fashion Technology HSC&RI, Madurai	107.00
14.	Development of tailored multimedia for food safety education for food processor and handlers in food industry of Tamil Nadu	Dr.S.Kanchana, Prof. & Head, FSN HSC&RI, Madurai	215.00
15.	Microencapsulation of micronutrients – iron and zinc to enhance the bioavailability in functional foods	Dr.S.Kanchana, Prof. & Head, FSN HSC&RI, Madurai	225.00

**Table 3b. National Food Security Mission (NFSM)**

Sl.No.	Theme area / strategic research	Budget Rs. in lakhs
1	Community based sustainable green energy system for achieving food security	200.00
2	Reclamation and nutrient management in salt affected soils through site specific approach	250.00
3	Alleviating mineral stress for rice and pulses	56.57
4	Development of bio inoculant technology for nutrient management and yield maximization	72.98
5	Development of bio inoculant technology for nutrient management in mechanized rice cultivation	110.41
6	Upscaling the cultivation of new climate resilient rice varieties / hybrids through improved seed chain	335.68
7	Upscaling the cultivation of high yielding millets through farmers participatory approach	450.20

8	Upscaling the cultivation of pulses through high yielding region specific varieties	374.16
9	Enhancing the seed availability to the farmers through optimizing seed storage techniques for rice and blackgram	189.07
10	Enhancing rice fallow pulse production in cauvery delta through farmers participatory approach	58.00
11	Mechanized millet cultivation	124.00
12	Post harvest processing and value addition of selected cereals and pulses	100.00
13	Establishment of referral centre for validating organic farmers technologies	169.00
14	Community based integrated pest management in rice and rice fallow pulses	139.20
<b>Total</b>		<b>2629.27</b>

### Agenda No.3

New Schemes sanctioned from January 2013 to December 2013

#### Govt. of India sponsored schemes / trainings

(Rs. in lakhs)

S. No.	Title of the Project / Scheme	Sponsor	Name of the PI & Location	Period	Budget
1.	Hybrid rice testing	ICAR	Dr.L. Subha Asst. Prof. (PBG)	2013-14	1.16
2.	ICAR- Frontline Demonstration (FLD) in Maize	ICAR	Dr.P.Jayamani MRS, Vagarai	Apr 2013– Mar 2014	1.98
3.	ICAR - Tribal Sub Plan (TSP) on Maize Production	ICAR	Dr.P.Jayamani MRS, Vagarai	Apr 2013– Mar 2014	1.00
4.	Tribal sub plan scheme for Castor	ICAR	Dr. S.Manickam, Prof. and Head, TCRS, Yethapur	2013-14	17.50
5.	ICAR Network Project on Outreach of technologies for temperate fruit crops	ICAR	Dr. J. Rajangam, Professor and Head HRS, Kodaikanal	2013-14	5.66
6.	Evaluation of AICORP developed elite breeding materials of groundnut	ICAR-GOI	Dr.M.Vaithiyalingan Asst. Prof (PBG) ORS, Tindivanam	Jan.2013- Dec. 2013	1.20
7.	UGC Scheme on Exploiting genetic variability of maize genotypes to Turcicum leaf blight	ICAR- UGC	Dr.K.Sethuraman MRS, Vagarai	Apr 2013– Mar. 2016	7.93

	disease under artificial epiphytic conditions				
8.	Haploid induction for rapid homozygosity to accelerate breeding programs in Cocoa ( <i>Theobroma cacao</i> L.)	ICAR- UGC	Dr. R. Gnanam Dept. of Plant Biotechnology, TNAU	Mar'2013-2018	48.93
9.	Development of repeatable protocols for induced androgenesis for gametoclonal variations to combat high priority problems in tomato	ICAR- UGC	Dr. R. Gnanam Dept. of Plant Biotechnology, TNAU	Apr' 2013-2016	9.99
10.	Assessment of Fluoride contamination in groundwater of Western Zone of Tamil Nadu	ICAR- UGC	Dr.P.Jothimani, Asst. Prof (ENS) WTC, Coimbatore	2013-2016	8.96
11.	Bio-prospecting of ACC-deaminase producing Plant Growth Promoting Rhizobacterial (PGPR) strains against root rot disease and terminal drought in Mung and Urdbean	GOI	Dr.A.Kamala-kannan Prof. (Plant Path.) AC&RI, Killikulam	Two years From 17.10.13	12.00
12.	Formulating value added products from minor tubers for food and industrial uses	GOI	Dr.S.Parvathi, Prof. & Head (HEX), HSC&RI, Madurai	Jan.2013– Dec. 2015	12.88
13.	Economic empowerment of SC and ST women on processing of maringaolefera leaves and its products as an income generating activity	GOI	Dr.S.Parvathi, Prof. & Head (HEX), HSC&RI, Madurai	Mar.2013– Apr. 2016	20.97
14.	Formulation of probiotic millet fruit bar	GOI	Dr.R.Vijayalakshmi, Asst. Prof. HSC&RI, Madurai	Apr.2013– Mar. 2016	10.88

15.	Study the phytochemical and antioxidant properties of wild fruits and development of value added products from the selected wild fruits	GOI	Dr.B.Nalla-kurumban, Asst. Prof. HSC&RI, Madurai	Apr. 2013- Mar.2016	10.36
16.	Evaluation study on the impact of Command Area Development and Water Management Programme in Gudaganur Command project	GOI	Dr.M.Chinnadurai, Director (CARDS)	July 2013 Dec 2013	1.00
17.	Sustained availability of Nitrogen, Phosphorus and sulphur nutrition to groundnut through soil bacterial consortia with special reference to <i>Burkholderia</i> sp., <i>Bacillus</i> sp., and <i>Thiobacillus</i> sp.	GOI- DBT	Dr. R. Sridhar Dept. of Plant Biotechnology, TNAU	Feb.2013- 2016	27.59
18.	Bioprospecting of coumarins obtained from medicinal plants and their synthetic derivatives for the anti microbial, anti feedant and anti cancer activity	GOI- DBT	Dr.V.P.Santhana krishnan Dept. of Plant Biotechnology, TNAU	Sep' 2013 -2016	16.17
19.	Marker Assisted Breeding for improving salinity tolerance in popular rice varieties of TN	GOI-DBT	Dr.S.Banumathy, Asst. Prof., (PBG) RRS, Tirur	2013- 2016	34.43
20.	Manipulation of the gut bacteria of extremely polyphagous species of mealybug - <i>Paracoccus marginatus</i> (Hemiptera: <i>Pseudococcidae</i> ) to develop a novel pest management strategy	GOI-DBT	Dr.R.Anandham Asst. Prof. (Agrl. Micro.)	Jan. 2013- Dec. 2013	16.13

21.	Identification and Mapping of QTLs associated with zinc deficiency tolerance in Rice	GOI-DBT	Dr.M.Dhandapani Asst. Prof. (PBG) RRS, Paiyur	Oct. 2013 to Sept.2016	21.96
22.	Centrally Sponsored Scheme-NHM - Aromatic crops	GOI-NHM	Dr.P.Nainar Main centre HC&RI, Periyakulam	2013-14	2.10
23.	GOI – NHM on spices	GOI-NHM	Dr.R.Sankara- narayanan HC&RI, Periyakulam	2013-14	14.75
24.	GOI-NHM-Spices	GOI-NHM	Dr.J.Rajangam, P&H HRS, Kodaikanal	2013-14	4.10
25.	Development tractor mounted hydraulically operated ladder	GOI-DST	Dr.R.Thiyagarajan Asst. Professor AC&RI, Killikulam	Feb. 2013 to Jan.2016	7.85
26.	Design and development of a sensor system for efficient water management in rice crop.	GOI-DST	Dr.K.Ramaswamy Dean, AEC&RI, Kumulur AEC&RI, Kumulur	2013- 2015	27 .00
27.	Development of power operated sugarcane sett cutter cum detopper and detrasher	GOI-DST	Dr.P.Kamaraj Asst. Professor (FMP)AEC&RI, Kumulur	2013- 2016	4.14
28.	Development of tractor mounted hydraulically operated ladder	GOI-DST	Dr.R.Thiagarajan Asst. Professor (FMP) AEC&RI, Kumulur	2013- 2016	7.85
29.	Management of insecticide resistance in storage pests of rice using molecular tools	GOI-DST	Dr.P.Yasodha, Asst. Prof. (Ento) AEC&RI, Kumulur	2013- 2016	15.50
30.	NHM-Human Resources Development – Training to farmers	GOI-HRD	Dr.P.Nainar FRS,Thovalai	2012-13	1.00
31.	Development of in vitro culture techniques through somatic embryogenesis for propagation of elite coconut cultivars	GOI-CDB	Dr. R. Renuka Dept. of Plant Biotechnology, TNAU	Nov. 2013	35.86

32.	Conduct of District level Seminar on cashew	GOI- Directorate of Cashewnut & Cocoa Development (DCCD)	Dr.S.Jeeva Professor (Hort) RRS, Vridhachalam	20.03.13	0.50
33.	Production forecast survey on cashew	GOI-DCCD	Dr.S.Jeeva Professor (Hort) RRS, Vridhachalam	2012-13	0.39
34.	District level seminar on Cocoa	GOI-DCCD	Dr.K.Chozhan KVK, Needamangalam	2013-14	0.50
35.	Entrepreneurship Development Programme	GOI-NMFP	Dr.V.P.Sanathi, Asst. Prof. HRS, Ooty	2012 - 2013	2.00
36.	Weather based agro Advisory Services India	GOI- IMD Agromet Scheme	Dr.N.Selvaraj, Prof & Head, HRS,Ooty	2009 onwards	3.00
37.	Soil and water quality appraisal in the salt affected land forms of Nagapattinam district	GOI, MoEF	Dr.D.Jayanthi, Asst. Prof (SS&AC) WTC, Coimbatore	2013-2016	17.20
38.	Development and validation of SNP marker platform for <i>Vigna</i> complex to map the MYMV and bruchids resistance	GOI- SERB	Dr.M.Pandiyam, ARS, Virinjipuram.	Nov. 2013 to Oct. 2017.	33.80
39.	Mechanisation in rice based farming to enhance rice productivity in Cauvery delta zone	NABARD	Dr.J.John Gunasekar Unit Head (FMP) AEC&RI, Kumulur	2013-2015	1.71
40.	NADP-RKVY-DSR Directorate of Sorghum Research	NADP	Dr.K.Velayutham, Director, CM, Coimbatore	1.4.2013 to 31.3.2014	23.41
41.	Empowerment of extension functionaries and commercial horticultural farmers on diagnosis and integrated management of mite pests of vegetable crops through hands-on training and farm school programmes	NADP	Dr. T. Abdul Razak, Professor Dept. of Agrl. Entomology, AC & RI, Killikulam	Jun 2013- May 2014	3.17

42.	Development of moderate shattering and early mutants in ADT (R) 47 rice through induced mutagenesis	BRNS	Dr.D.Sassikumar Asst. Professor (PBG) SWMRI, Thanjavur	2013-14	20.04
43.	NABARD CAT Programme	NABARD	Dr.K.Chozhan KVK, Needamangalam	2013-14	1.66
44.	Real Time Pest Surveillance of Rice under National initiative on Climatic Resilient Agriculture	NCIPM, New Delhi	Dr.V.G. Mathirajan, Assistant Professor (Ento.) and Dr.K. Karunanithi Professor (Patho.)	2013-14	5.00
<b>Trainings</b>					
45.	PPVFRA – GOI – one day awareness programme	GOI	Dr.V.Alex Albert KVK, Needamangalam	2013-14	0.80
46.	Training on cashew production technology	GOI-DCCD	Dr.M.S.Aneesa Rani Professor (Hort) RRS, Vridhachalam	11.03.13 to 14.03.13	1.80
47.	Training on cashew apple utilization	GOI-DCCD	Dr.S.Jeeva Professor (Hort) RRS, Vridhachalam	2012-13	0.50
48.	CAT training programme on “Popularization of improved agro techniques for castor in Salem district of Tamil Nadu”	NABARD	Dr.G.Senthilkumar Asst. Prof. (Agron.) TCRS, Yethapur	Three days programme during 2013-14	0.38
49.	CAT training programme on “Popularization of improved agro techniques of cassava in Salem district of Tamil Nadu”	NABARD	Dr.M.Velmurugan Asst. Prof. (Hort.) TCRS, Yethapur	Three days programme during 2013-14	0.38
50.	Organic farming as Business for Improving Farmers Income and popularization of SSI method in Erode District of Tamil Nadu	NABARD CAT	Professor and Head, ARS, Bhavanisagar	Mar.2013 to Sep.2013	0.85

51.	Recent developments in cocoa cultivation	Directorate of Cashewnut and Cocoa Devpt. (DCCD)	Dr.P.Jansirani Dept. of Spices & Plantation Crops, Coimbatore	2013-14	0.90
52.	PPVFRA awareness programme	GOI-PPVFRA	Dr.V.Alex Albert KVK, Needamangalam	2013-14	0.80
53.	Training on cultivation of temperate fruit crops	SHM, Kerala RKVY	Dr. J. Rajangam, Professor and Head HRS, Kodaikanal	2 days training	1.27
					<b>184.41</b>

### State Government

(Rs. in lakhs)

S. No	Title of the Project / Scheme	Sponsor	Name of the PI & Location	Period	Budget
1.	Estimation of cost of cultivation of major crops in Tamil Nadu		Dr.M.Chinnadurai Director, CARDS TNAU, Coimbatore	1.4.2013- 31.3.2014	294.20
2.	District watershed development agency on training on production of vegetables and fruits under dryland	Watershed Development	Dr.M.Selvarajan, HC&RI, Periyakulam	2013-14	2.93
3.	Composting techniques for the management of water hyacinth infestation in surface water bodies of Thanjavur district.	ATMA	Dr.A.Bharani Asst Prof (ENS)	Apr 2013- March 2014	1.00
4.	Evaluation of carrot washed water as irrigation source for vegetable cultivation in Nilgiris		Dr.N.Selvaraj, Prof & Head, HRS, Ooty	Dec.2012 Dec.2013	6.00
5.	Development of eco-village through sustainable organic farming system at Mel Kavatty village		Dr.N.Selvaraj, Prof & Head, HRS, Ooty	Feb.2012 Mar. 2013	6.30
					<b>310.43</b>



## Private Agency

(Rs. in lakhs)

Sl. No	Title of the Project / Scheme	Sponsor	Name of the PI & Location	Period	Budget
1.	Bioefficacy study to evaluate the product biofungicide Taegro on chilli <i>Fusarium</i> , <i>Rhizoctonia</i> and <i>Pythium</i>	M/s Novozymes South Asia Pvt. Ltd., Chennai	Dr.J.Sheela,Prof., Dept. of Vegetable Crops, HC&RI, Periyakulam	Oct. 2013 to Sept. 2014	2.19
2.	Bioefficacy study to evaluate the product growth regulator Revv on chilli and tomato for yield enhancement	M/s Novozymes South Asia Pvt. Ltd., Chennai	Dr.A.Balakumbahan, Asst. Prof. (Hort.) Dept. of Vegetable Crops, HC&RI, Periyakulam	Sept. 2013 to Aug. 2014	3.50
3.	Bioefficacy study to evaluate the following Fungicide – Tebuconazole 430 SC - Groundnut tikka leaf spot and rust Fungicide – Tebuconazole 430 SC - Rice sheath blight and blast	M/s Bayer Crop Science Limited	Dept. of Plant Pathology, TNAU, Coimbatore	2013 and 2014	4.83
4.	Bioefficacy study to evaluate the products Growth promoter Antracol 70 WP (Propineb) + Mn and B on tomato	M/s Bayer Crop Science Limited	Dept. of Crop Physiology, TNAU, Coimbatore	Oct. 2013 to March 2014	2.02
5.	Bioefficacy study to evaluate the product growth promoter Nativo 75 WG (Trifloxystrobin 25%+ Tebuconazole 50%) on Onion, cotton, groundnut & chillies	M/s Bayer Crop Science Limited	Dept. of Crop Physiology, TNAU, Coimbatore	Dec.2013 Nov.2014	15.09
6.	Bioefficacy study to evaluate the product fungicide ready mixture (Trifloxystrobin 25% +	M/s Bayer Crop Science Limited	Dept. of Plant Pathology, AC&RI, Madurai	Oct. 2013 to March 2015	3.50

	Tebuconazole 50% - 75 WG) of on pomegranate leaf / fruit spot				
7.	Bioefficacy study to evaluate the product fungicide Tebuconazole 25.9 EC on groundnut rust, leaf spot and chilles fruit rot and powdery mildew	M/s Tropical Agrosystem (India) Pvt. Ltd.	Dept. of Plant Pathology, TNAU, Coimbatore	2013	10.80
8.	Bioefficacy study to Potassium humate and sea weed extracts - on yield - Cauliflower Gibberellic acid and seed weed extracts - on yield - Banana Insecticide -D-Teron Tomato – White flies and thrips	M/s Tagros Chemicals India Ltd.	KVK, Sirugamani	2014-15	4.42
9.	Bioefficacy study to evaluate the product liquid manure (PSO6) of on banana through drip irrigation	M/s Subhashri Bio Energies (P) Ltd.	Dept. of Agronomy, TNAU, Coimbatore	Dec.2013 Nov.2014	4.42
10.	Effect of Heavy Weight Tandem (HWT) on the growth and yield of Sugarcane	M/s. ARAW Agro Private Ltd., Chennai	Dr.S.Panneer-selvam Prof. and Head SRS, Sirugamani	July 2013 to June 2014	2.20
11.	Performance of Structured water on growth, yield and quality of cotton and vegetables	VWF, Pvt. Agency	Dr.D.Jayanthi, Asst. Prof (SS&AC) WTC, Coimbatore	2013- 2015	6.40
12.	Evaluation of humic acid granulated (HAG) black urea for major crops of Tamil Nadu	M/s.AYYA FOODS LIFE CARE, Theni	Dr. M. Elayrajan Dept. of SS&AC, Coimbatore	1.2.2013- 31.1.2014	8.08
13.	Bioefficacy study to evaluate the green technology products on cotton and groundnut for two seasons	M/s Agrinos India Pvt. Ltd., New Delhi	Dept. of SS&AC, TNAU, Coimbatore	Sep.2013 -Aug. 2015	8.51

14.	Evaluate low cost drip laterals a product on sweet corn	M/s KSNM Marketing	Dept. of Agronomy, TNAU, Coimbatore	Sept.2013- Aug.2014	2.40
15.	Bioefficacy study to evaluate the products insecticide Spinetoram 6% + Methoxyfenozide 30% SC on insect pests in rice for one season	M/s Dow Agro Sciences India Pvt. Ltd., Mumbai	RRS, Ambasamudram	Pishanam 2013 / Kar 2014	3.55
					<b>81.91</b>

### Foreign Agency

(Rs. in lakhs)

S.No.	Title of the Project / Scheme	Sponsor	Name of the PI & Location	Period	Budget
1.	Dynamics of N under different crop establishment methods and residue management	IRRI, Phillipines	Dr. R. Rajendran, Director, TRRI	August 2013 to Sept., 2015	11.45
2.	Green Super Rice Project	IRRI, Phillipines	Dr.Maheswaran Director of Research i/c	2013-14	1.25
3.	Options for water saving / improve water use efficiency and drought avoidance in the Cauvery Delta	IRRI, Phillipines	Dr.R.Rajendran Director i/c	August 2013 to Sept. 2015	11.50
4.	Studies on dynamics of N availability under different crop establishment methods and residue management	IRRI, Phillipines	Dr.R.Rajendran, Director i/c, TRRI	August 2013 to Sept. 2015	6.80
5.	Cereal System Initiative for South Asia (CSISA) - Phase-II – Development of high yielding, Heat and water stress tolerant rice varieties for current and future cereal and mixed	IRRI, Phillipines	Dr. R. Sraswathi Professor (PBG) Dr. R. Suresh Assist. Professor (PBG), TRRI	June 2013 to June 2015	6.70

	crop live stock system				
6.	Sustainable cocoa production in Tamil Nadu, India	Kraft Foods, UK	Dr. N. Kumar (Nodal Officer) Coimbatore	2013 to 2018	248.93
7.	Nutrient Manager for Rice	IPI, Israel	Dr.R.Rajendran Director i/c TRRI	Apr.2013 to March 2014	0.80
					<b>287.43</b>

### NADP Projects

Sl.No.	Title of Scheme	Amount (Rs. in lakhs)	Implementing Department / Dean / Directorate
1	Development of agro advisory services using automatic weather station data at block level in Tamil Nadu	350.00	Dept. of ACRC / Director, CMS
2	Establishment of back office at Tamil Nadu Agricultural University to interface with e-Resource division of agro marketing intelligence and business promotion centre, Trichy	87.88	Directorate of Extension Education / Director, CARDS
3	Empowerment of farmers through special programme on market led precision farming system	659.00	Dean, HC&RI, Coimbatore
4	Special package for Cauvery delta districts	324.46	TRRI, Aduthurai / Dean, Agrl. Engineering
5	Demonstration of synchronized maturing pulses varieties with key technologies and mechanisation for higher productivity	60.00	Dept. of Pulses and Dept. of Agronomy / Director, CPBG and Director, CMS
6	Promotion of Quality Seed Production In Green Manures	40.00	Special Officer, Seeds
7	Enhancement of productivity and quality in Grapes through Hi-tech management practices	90.00	Grapes Research Station, Theni and Dean, HC&RI, Periyakulam
8	Demonstration of Direct Seeded Rice (DSR) in dry and puddled condition to enhance productivity in selected districts of Tamil Nadu	100.00	Director, CMS
9	Establishment of back office at Tamil Nadu Agricultural University to interface with e-Resource division of Agro Marketing Intelligence and Business Promotion Centre, Trichy	70.00	Directorate of Extension Education / Director, CARDS
		<b>1781.34</b>	

## Abstract

Sl.No.	Title of the Project / Scheme	Budget (Rs. in lakhs)
1	Govt. of India sponsored schemes / trainings	184.41
2	State Government	310.43
3	Private Agency	81.91
4	Foreign Agency	287.43
5	NADP Projects	1781.34
	<b>Total</b>	<b>2645.52</b>

## Agenda No.4

### NEW ACTIVITIES UNDERTAKEN

#### a. Release of varieties and agricultural implements 2014

A total of five technologies comprising varieties / hybrids (Four in agricultural crops, and one agricultural implement) proposed by the University Technology Release Screening Committee (UTRSC) for consideration and approval by the 44th State Variety Release Committee for State Release were approved. These technologies were released by Director of Agriculture in the State Level Farmers Day held at TNAU on 11.1.2014.

Sl. No.	Varieties / hybrids / agrl. implements
1.	Rice TPS 5 - ARS, Thirupathisaram
2.	Blackgram MDU 1 - AC&RI, Madurai
3.	Fodder Sorghum CO 31- Dept. of Forage crops, TNAU, Coimbatore
4.	Butter Pear Ooty 1 - HRS, Ooty
5.	Tractor drawn single row / two row cassava harvester - AMRC, TNAU, Coimbatore

#### b. Newer initiatives taken in Directorates / Colleges / Stations / Departments

##### Seed Centre, Coimbatore

- Awarding of 3 best seed production centre and 3 best seed production scientists during farmers' day has been initiated.
- Automatic Seed vending machine has been installed to promote kitchen and roof garden through easy access of seed delivery systems for the benefit of farmers and consumers.

### **WTC, Coimbatore**

- Training programme “Water Management” for the Tribal Farmers started on 31.01.2013 in Nilgiris
- A Model Watershed established in Water Technology Centre was inaugurated on 02.06.2013 by Prof.R.K.Sivanappan, Founder Director of WTC.
- Prof.R.K.Sivanappan’s Endowment Lecture was initiated and the 1st endowment lecture was delivered on 24.07.2013.
- A special lecture series entitled “Knowledge on Water Resources” was initiated for sharing knowledge on water resources of Tamil Nadu. The 1<sup>st</sup> special lecture was delivered by Er.S.Sivalingam, Asst, Executive Engineer of PWD, WRO, Coimbatore on “ Parambikulam Aliyar Project” on 06.09.2013.
- An international Conference on “Drip Fertigation in Rice” was organized at Water Technology Centre in collaboration with Netafim (I) Ltd., during 17.10.2013 to 19.10.2013.
- A New 6 month certificate course on “Water Management” for the rural youth has been initiated at the Central University of Tamil Nadu at Tiruvarur. An MoU in this regard has been signed with the Central University of Tamil Nadu on 29.11.2013.
- Under the Dept. of Sceience and Technology sponsored Sir.C.V.Raman Fellowship progrmme, Water Technology Centre was identified as the host centre for Indo-African Researchers. Mr. Isaya Vincent Sijaly, Co-ordinator of Irrigation Programme from Nigeria has come to Water Technology Centre on a 3 month fellowship programme on 27.11.2013.
- A Nation Groundwater Conference was organized at Water Technology Centre during December 09-11, 2013 which was attended by 226 scientists all over India. 81 research papers on groundwater were presented during the conference.
- A Micro Irrigation Model was established in Water Technology Centre in the eve of Farmers’ Day 2013 for the benefit of visiting farmers.

### **HRS, Thoivalai**

- Established Front Line Demonstration Plots on Aromatic crops (Thulasi) in an area of 2 ha at Thoivalai, Kozhikottupothai aand Leepuram villages during November,2013
- Produced 10,000 nos.of curry leaf seedlings availing the assistance of Rs.50,000 from Directorate of Arecanut and Spices,Calicut, during October,2013

### **HRS, Ooty**

- a) Five days mass campaign programme in five watershed areas at Gudalore (Mukkattihalli, Payampuzha, Chaliyar / Vaithri, Erumadu, Devarshola and Devala). A State Level mass campaign on Advanced Production and Post harvest technologies on Pepper was organized with the sponsorship from GOI - NHM - DASD from 25.3.13 to 29.3.13 under

five major watershed areas at Gudalur. Village level mass campaign programme was conducted at four villages Puliamparai, Devala, Devarshola and Killur and 200 farmers viz., benefited. Around 300 farmers attended the mass campaign organized at Janaki Ammal Kalyana Mandapam, Gudalur.

b) Farmers Seminar

The Garlic seminar on “Production and Post Harvest Technologies of Garlic” was conducted at Horticultural Research Station, Ooty on March 18<sup>th</sup>, 2013. Totally 240 farmers from three watershed areas of Kookalthurai in Kookalthorai block, Melkavatty and Athigaratty in Ooty block have participated in the training programme.

c) Mushroom training

One day mushroom training is being conducted first of every month since July 2010. So far, 295 members have been benefited.

Under the GOI-AGROMET-Agro Advisory Service, weekly twice weather based agro advisory service is provided to the farmers. The agro advisory service is provided to the farmers through SMS. Around 1000 numbers of leading farmers of Nilgiris were selected and the service is provided through their mobile numbers.

**HRS, Kodaikanal**

- Established a separate block for ‘Nut crops’ viz., Walnut, Almond and Pecan nut and enriched the block with the varieties of CITH, Srinagar.
- Erected different systems for training in apple under “Plant architectural engineering” for higher energy harvest vis-à-vis productivity.
- Enriched the germplasm collection with medium chilling varieties of Apple, Peach, Nectarine, Plum and Pear.

**VRS, Palur**

- Jack day – 2013 was organized at VRS, Palur on 17.07.2013. A total of 43 elite Jack growers attended the training. All the aspects Jack production such as cultivation practices and plant protection methods were discussed and farmers queries were attended. This jack day is first of its kind in the state and the programme has been flashed in popular dailies in Cuddalore district.

**SRS, Sirugamani**

- Collection and evaluation of chewing cane from different parts of Tamil Nadu.
- Establishing new betelvine garden to maintain already released varieties and germplasm.

### **TCRS, Yethapur**

- Front Line Demonstrations (15 FLDs) has been laid out during 2013-14 in Salem, Namakkal and Erode (5 FLDs; each one acre in each district) for cassava tonic foliar spray. Test verification trial on cassava tonic foliar spray was also initiated during January, 2014 in Sago Serve member farmer field (4 trials).
- Production of castor gold through VCS was initiated and 370 (100 ml pack) numbers were distributed to the castor growers which could cover 370 acres.

### **ORS, Tindivanam**

- Details of Front Line Demonstration for 2013-14
  - Introduction of newly released paddy ADT (R) 50 in SRI system
  - Popularization of ecofriendly management practice for blast and sheath blight in paddy
  - Popularization of bajra hybrid CO 9 for rainfed conditions
  - Popularization of mechanization in irrigated groundnut
  - Integrated Crop Management in sesame cv. TMV 7
  - Seed production and popularization of integrated crop management practices in Blackgram VBN 7
  - Integrated Pest and Diseases management in small onion
  - Integrated approach for successful coccinia cultivation in peri-urban horticulture production system
  - Integrated Crop Management in musk melon with emphasis on downy mildew management
  - Integrated Crop Management in Guava
  - Commodity Group Approach for water melon

### **AEC&RI, Kumulur**

- Under NABARD scheme - "State Level Demonstration cum Exhibition was conducted on 18.10.2013 "Complete Mechanization in Rice cultivation from Seed to Seed" was demonstrated to 1500 farmers and Department Officials of Agricultural and Agricultural Engineering of Delta Districts. A Model Mechanized Rice Farm of 40 acres was established.
- Two field days were conducted on farm mechanization on 21.12.2013 & 22.01.2014 with the assistance of NABARD and technologies related to farm machinery, water harvesting and conservation, artificial ground water discharge, waste water treatment and irrigation and micro irrigation were demonstrated.
- Under NAIP scheme, product promotion workshop for promoting bakery products was conducted on 29.03.2013. Totally, 50 number of women self help group from Trichy district attended and got benefitted.
- National level students symposium on "Emerging technologies in Agricultural Engineering" was conducted on 29.11.2013 at Agricultural Engineering College and Research Institute, Kumulur.



## Agenda No.5

### List of MoUs signed between TNAU and other academic institutions and private companies from January 2013 to December 2013

Sl. No.	Name of the institutions / companies / firms with which MoU signed	Name of the project / study / scheme etc.	PI incharge of the project	Duration (with date of commencement)
1.	Central University of Tamil Nadu	Offering six months certificate course on Water Management	Dr.B.J.Pandian, Director	6 months 24.1.2013
2.	M/s Instrument Automation, Coimbatore	DST Development of network and online metering of drying parameters of biomass hot air generation system integrated with solar tunnel dryer for agro products drying applications	Dr.P.Venkatachalam	2 years 1.3.2013 to 28.2.2015
3.	Rajshree Sugars & Chemicals Ltd., Coimbatore	Implementation of the research project on Maximizing sugarcane Productivity through GIS based balanced fertilization	Dr.B.Bakiyathu Saliha Asst. Prof. (SS & AC) AC&RI, Madurai	Jan to Dec 2012 Jan to Dec 2013
4.	Rashtriya Chemicals and Fertilizers Ltd., Mumbai	Implementation of the research project on Evolving and evaluating Soil and Crop Specific Fertilizer Best Management practices for maximizing agrl. productivity	Dr.B.Bakiyathu Saliha Asst. Prof.(SS & AC) AC&RI, Madurai	Jan 2013 to Mar 2016
5.	ICAR - NAIP	Strengthening of Digital Library and Information Management under NARS	Dr.R.Vijayaraghavan Special Officer (P&PR)	April 2013 to March 2014
6.	M/S. Tropical AgroSystem (India) Pvt. Ltd., Chennai	Isolation, screening and evaluation of bioactive molecules from actinomycetes against major crop mites	Dr.P.Marimuthu	March 2013- Feb. 2016

7.	Syngenta India Limited, Coimbatore	Field evaluation of Paclobutrazol 23 % SC (Cultar 25%) on flowering and yield of pomegranate	Dr.S.Vincent Assoc. Professor (Crop Physiology)	April 2013 to July 2014
8.	University of Tokyo, Japan	Academic Exchange and Research Collaboration	Dr.R.Chandrababu, Director i/c, CPMB	5 years 2013 - 2018
9.	Department of Biotechnology, GOI, New Delhi	DBT – MAS: Marker assisted selection for Phytophthora and powdery mildew resistance and effective nodulation in Soybean (Glycine max L. Merr.)	Dr. J.Ramalingam, Professor (Biotech)	Three years from May 2013
10.	Council of Scientific & Industrial Research (CSIR), New Delhi	Thresher cum winnower for glory lily pods	Dr.Kailappan Prof.,Dept. of F&APE, Coimbatore	June 2013 onwards
11.	DBT, GOI, New Delhi	Development of National Database on Mango	Dr.T.N.Balamohan, SO, HC&RI (W), Trichy	March 2013 to March 2016
12.	Centre for development of advanced computing Kolkata (C-DAC) under the ministry of Communication and Information Technology	Blossoming and quality testing of jasmine flower using electronic nose technology	Dr.K.R.Rajadurai Asst. Prof. (Hort.)	May 2013 (2.5.2013) to March 2014

For students thesis research work, MoU's have been signed with following institutions for a period of 3-5 years.

1. National Research Centre for Grapes, Pune (11.7.2013 onwards, 3 years)
2. National Research Centre for Citrus, Nagpur (19.7.2013 onwards, 5 years)
3. Jain HI-Tech Agri Institute (JHAI), Jalgaon (12.12.2013 onwards, 3 years)
4. Maharashtra Institute of Pesticide Formulation Technology, Gurgaon (19.12.2013 onwards, 5 years)

# 47<sup>th</sup> RESEARCH COUNCIL MEETING

25<sup>th</sup> February, 2014



## AGENDA NOTES

**DIRECTORATE OF RESEARCH  
TAMILNADU AGRICULTURAL UNIVERSITY  
COIMBATORE – 641 003**

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