

Directorate of Research

Tamil Nadu Agricultural University
Coimbatore 641 003

84th Scientific Workers' Conference

INTERIM ACTION TAKEN REPORT

Venue : Conference Hall, Secretariat, Chennai

Date : 26.11.2019

LR.NO.18483/AU/2018-5, DT.17.09.2019 & D.O.LETTER NO.238/APC&PS/2019, Dt.15.10.2019

| No | Recommendations | Action Taken |
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| Follow up Action on 84th SWC | | |
| 1 | Some of the recently released TNAU varieties such as CO-50, CO-52 ADT-50, MDU-1,TRY-3,TPS-5 in Paddy ; ADT-3 and ADT-5 CO-6,VBN-6 and VBN-8 in Black gram ;CO-8 in Red gram ; VRI-8 and TMV-4 in groundnut are not performing well <i>vis a vis</i> their claim. The reasons for why these varieties are <u>not popular are to be analysed in the field?</u> | <ul style="list-style-type: none">• All the crop varieties are released only after the conduct of minimum number of 125 yield evaluation trials. The trials includes Station Trials, Multi Location Trials of Tamil Nadu Agricultural University and Adaptive Research Trials of Department of Agriculture in farmer holdings. Only after critical evaluation and the superior performance of the test entries, the best one is released as variety. |

(Action : Director, CPBG)


TNAU Seed Distribution (Qtls)

| Types | 2017-18 | 2018-19 |
|---------------|---------------|---------------|
| Breeder Seeds | 1801 | 1478 |
| Foundation | 2828 | 3174 |
| Certified | 1495 | 2687 |
| TFL | 4610 | 5809 |
| Total | 10,734 | 13,148 |

**TNAU produced and supplied to the
Department of Agriculture as per
the intend received**

- Generally, in the generation system of seed multiplication system, it takes a minimum of four years from the time of release for the adoption of any crop varieties as it has to undergo different processes like notification and to enter to seed supply chain and for the final stage of certified stage which is the stage of seed that the farmers are using for cultivation
- The spread of new crop varieties depends on the timely availability of sufficient quantities of certified seed to the farmers which in turn depends on uninterrupted seed chain supply system.
- The uninterrupted seed chain supply system is being ensured by Tamil Nadu Agricultural University in the way of Breeder Seed Production and by Department of Agriculture in way of Foundation seed and Certified seed production. As per the indent received by the Department of Agriculture, the Breeder seed production is taken up by TNAU.
- As the spread of new crop varieties can be enhanced by strengthening seed supply chain system, it is suggested that required measures should be taken up by TNAU and Department of Agriculture in a combined manner to ensure the timely availability of quality seeds in sufficient quantities.

It is further requested that the earlier implementation of the proposed Centre of Excellence on groundnut could be helpful for production of adequate quantity of quality seeds of groundnut which has lower seed multiplication ratio.

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| <p>2</p> | <p>TNAU to get Breeder seeds of BARC released pulses varieties to produce Foundation seeds and give to department for further multiplication and distribution.</p>  <p>(Action : Director, CPBG; Director, Seeds)</p> | <ul style="list-style-type: none"> • The breeder seeds of TT401 were obtained from BARC and foundation seed production of the same has been taken up at CRS, Veppanthattai during the current season in an area of two acres. • Further, the performance of TT401 is being evaluated at Coimbatore, Vamban, Paiyur, Yethapur and Virinjipuram in comparison with the check varieties, CO8 and CORg7. • Director of Agriculture has been requested to provide the list of preferred BARC varieties in blackgram, greengram and redgram in Tamil Nadu so as to get the breeder seeds of the concerned varieties from BARC, Mumbai. |
| <p>3</p> | <p>TNAU will keep ready the seeds of Castor (YTP-1) and Sunflower (C0-5) to supply to the department to expand the area under oilseeds.</p> | <p>CASTOR</p> <ul style="list-style-type: none"> • As on 7.11.2019, YTP 1 and YRCH 1 (400 & 1500 kg) seeds are available for distribution • Efforts have been undertaken to produce castor seeds (YRCH 1 & 2) in 100 acres and the sowing is in progress. • Further, action initiated to take up foundation seed production in castor YTP 1 / YRCH 1 in 2 acre at TCRS, Yethapur |



TANSEDA


- Advance indent has been given to TNAU for 2020-21 for 50 kgs of breeder seeds of Castor YTP 1 variety. It will be promoted in the districts of Namakkal and Salem from Kharif 2020 onwards.

SUNFLOWER

- Similarly, foundation seed production in sunflower CO 5 in 1 acre has been programmed at ARS, Bhavanisagar

TANSEDA

- Normal area coverage under sunflower in the State is 8600 ha and the potential districts are Thoothukudi, Karur, Trichy, VirudhuNagar.
- JDAs of the concerned districts have informed that the performance of Sunflower Hybrid CO H 3 can be taken up in progressive farmers field in co- ordination with TNAU, as the SSF located in the above districts are not suitable for growing sunflower crop.
- Accordingly, indent has been placed for supply of **100 Kgs of Sunflower Co H3 hybrid F1 seeds** to TNAU for Thoothukudi, Karur, Trichy and Virudhunagar districts to take up sowing in Rabi season .

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| <p>4</p> | <p>TNAU should evolve a suitable sugarcane variety to replace CO 86032. The Sugarcane Research Stations of TNAU should evaluate the performance of a newly released Co. 11015 (Atulya) in June 2019 from Sugarcane Breeding Institute, Coimbatore.</p>  | <p><u>New Sugarcane variety Co. 11015 (Atulya)</u></p> <ul style="list-style-type: none"> • At Sugarcane Research Station, Cuddalore, sugarcane variety Atulya along with check varieties are being combatively evaluated in 1.5 acres. • The crop is in grand growth phase. The performance will be reported after the harvest. |
| <p>5</p> | <p>Efforts need to be strengthened for the early release of the synchronized maturing cotton variety which is under trail now</p> <p>(Action : CPBG)</p> | <ul style="list-style-type: none"> • A variety release proposal on "synchronized maturing cotton variety with zero monopodia" culture TCH 1819 is submitted for approval by the State Variety Release Committee in December 2019. • The features of the culture are Compact erect type (95-100 cm), Zero monopodia and short sympodial branch, Bolls (15-20 Plant⁻¹) Wt. 3.5 – 4.0 g, Synchronized boll maturity, Duration : 125 – 135 days |



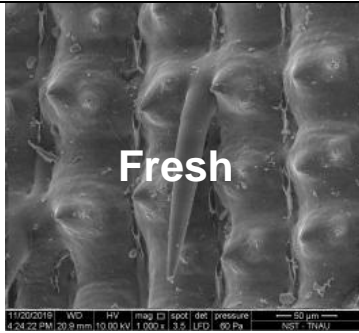
- **Yield** : 1835 kg ha⁻¹, Ginning (%) : 35.1, Long staple (27.0 mm), Bundle strength : 26.1 g tex⁻¹. Suitable for mechanized harvest.

6 Maximum number of **Multi Location Trials (MLTs)** and demonstrations in various places need to be carried out before releasing a variety to evaluate its performance under a varied conditions. Maximum number of trials should be carried out in Government Farms (SSFs and SHFs) that too under the supervision of the scientists or breeder concerned so that the actual performance is noted by the department officials and farmers together and there is scope to improve it further. (**Action** : CPBG; DOA)

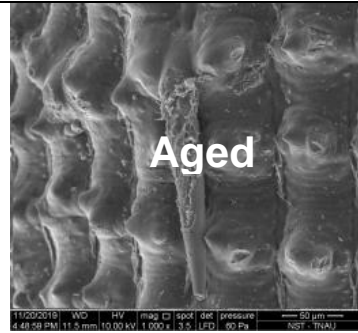
- Presently, on an average 10 numbers of **Multi Location Trials (MLTs)** each in two seasons are conducted for all the crops. The MLTs are the first level of testing for the adaptability of test entries and hence it is suggested that MLTs could be restricted to TNAU centres only and not to the SSFs and SHFs.
- The **ARTs** conducted in farmers holdings by the Department of Agriculture could be monitored by TNAU scientists for which the details of ARTs may be shared with TNAU for making joint visit to ART plots.

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| | | <p>TANSEDA</p> <ul style="list-style-type: none"> • TNAU was addressed to lay MLTs in SSFs vide Lr.NO.TANSEDA1/107616/2019 Dt.03.09.2019. In this regard, TNAU replied that 'Since the trial is at preliminary stage of testing the adaptivity of entries for their resistance to pest and diseases, the trials need not be exposed to the farmers'. Since, the MLTs are suggested in SSF, TNAU may be insisted to lay out MLTs in SSF. • The ART laid by the Agricultural Officers (Extension) at block level are being inspected by DD(SS) and block ADAs during their regular visits and reviewed by JDAs in the Zonal workshops conducted every month and also reviewed by the Director of Agriculture in the DD(SS) & JDAs review meetings. |
| 7 | <p>Information on the Front Line Demonstrations (FLDs) or MLTs carried out in KVKs or TNAU farms should be passed on to the district level officer concerned so that the officials can see the performance and take the farmers also there to see the performance. Minikits of new varieties may be given through JDAs/DDHs for proper recording of the performance. (Action : CPBG; DEE; DOA)</p> | <ul style="list-style-type: none"> • As the MLTs are first level of testing for the adaptability of test entries and they are coded for unbiased evaluation it is informed that MLTs are not the appropriate stage to be shown to the farmers instead, the ARTs conducted by the DOA and the FLDs conducted by KVKs can be visited by the farmers • The Dean, HC&RI, Coimbatore informed that after the ARTs, minikits of varieties will be given to JOHs/DDHs. |

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| | | <p>ATMA</p> <ul style="list-style-type: none"> TNAU has been addressed to furnish the crop wise FLDs and MLTs laid, so as to organize an exposure visit. TNAU suggested that the ATMA farmers can be taken to ART fields (instead of MLT fields) which are conducted by the State Dept. of Agriculture. |
| 8 | <p>Gujarat varieties of ground nut are said to be performing well in the State. TNAU to include the varieties in the selection process and develop varieties on par with the performance of these varieties.</p> | <p>The alternate to Gujarat groundnut varieties, the TNAU has identified following genotypes</p> <p>TMV 7 – TMV 14, BSR 2 VRI 2 – VRI 8 JL24 – VG 13163 (proposed for release during 2020) ICGV91114 – BSR 2 GG7 – TMV 14, VG 17008</p> <p>The varieties, K6, K9 and GG7 have been included as check varieties in MLT (Rabi'19-20)</p> |
| 9 | <p>The paddy variety CO 51 has viability issues which needs to be immediately addressed.</p> <p>Seed Coat Morphology</p> | <ul style="list-style-type: none"> Seed deterioration of CO 51 paddy seeds is due to the anatomical damage of the seed coat as indicated by SEM Biochemical changes did not show variations Causes for poor storability of CO 51 paddy seeds in various centres are being studied (AC & RI, Madurai, TRRI, Aduthurai, ADAC & RI, Trichy and DSST, Coimbatore). In order to improve the viability of CO 51 rice, seeds |



Fresh



Aged

(Action : Seed Center; Dept. of Nano Sci. & Tech)

should be dried to 10% moisture content, treated with halo polymer (Hiltron) @ 3 g / kg + carbendazim @ 2 g / kg and stored in super grain bag.

10

Agri-nano products in agriculture (nano-fertilizers, pesticides, seed invigoration), horticulture for extending shelf-life of fruits & vegetables (nano-emulsion, nano-packaging) and sensors for moisture and nutrient detection for precision farming may be demonstrated to field officers

Nano-Stickers



Nano-Stickers :

- Supplied **100 Nos** of Nano-stickers loaded with hexanal were tested in two packhouses one in Krishnagiri and another in Theni for its effects on shelf-life extension of mangoes (Alphonso & Neelam) and bananas (Grand naine & Nendran).
- As suggested, nano-stickers will be supplied for large scale testing involving Ag. marketing and Department of Horticulture.

Nano-Stickers in Fruit Boxes



Nano-emulsion for dipping

- Large scale demonstration of dipping of four bananas (Grand naine, Nendran, Red banana and Ney Poovan) was performed in Theni Regulated Market involving 50 farmers and 10 officials in July 2018. The technology proposal is submitted for release during 2019.

Stakeholders' Meet

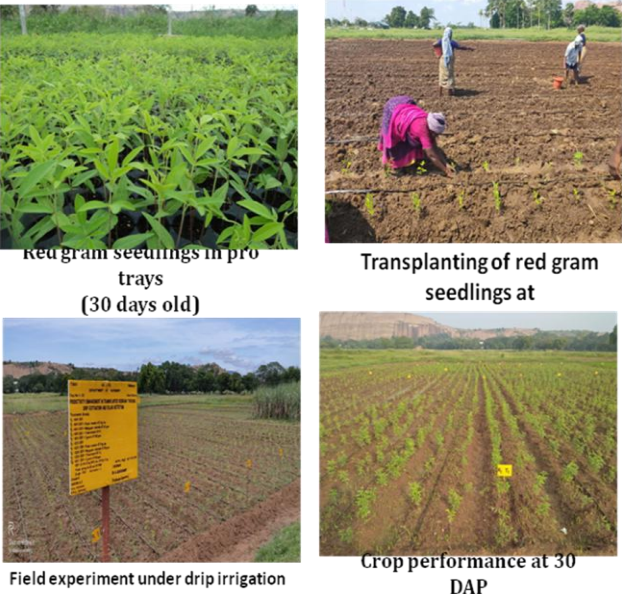
One day Sensitization program on **"Nano products in Agriculture"** was arranged to the field officers" of Coimbatore district on 16.10.19 at Tamil Nadu Agricultural University, Coimbatore.

Dr. K.S. Subramanian, Director of Research and **Dr. A. Lakshmanan**, Professor & Head (DNST) of Tamil Nadu Agricultural University, Coimbatore acted as Resource Person for this training program organized by the JDA, Coimbatore. Around 45 participants including Deputy Directors', Assistant Directors of Agriculture, Agricultural and horticultural Officers attended the training program. The following nano-products were explained to the participants.

- (1) Enhanced Freshness Formulation for fruit preservation
- (2) Nano-fiber based seed encapsulation in pulses
- (3) Hydrogel for enhancing Water use efficiency
- (4) Biopolymer from agricultural wastes.

Similar trainings will be conducted in the coming months to other district officials in co-ordination with Department of Agriculture.

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| 11 | <p>Scientific validation of Zero Budget Natural Farming (ZBNF) needs to be done immediately as Government of India is going to bring out a scheme for the same shortly. Detailed report enclosed in Annexure 1.</p> <p>(Action : DCM ; DOA)</p> | <ul style="list-style-type: none"> • The ZBNF is being tested in 20 locations across the country by ICAR as part of Organic Farming Network Project and TNAU has one such location in Coimbatore. • The ZBNF encompasses 4 components namely Jeevamirth, Ghana Jeevamirth, Mulching (Achabhau) and vapana (soil aeration) • The ICAR is organizing a National Workshop on ZBNF during November 11-14, 2019 at CARI, Port Blair and finalize the follow up action and conclude after three years for large scale adoption. • Unsubstantiated claims 1. cost of ingredients unaccounted, 2. no independent studies, 3. soils with multi-nutrient deficiencies, 4. imbalance between addition and removal by crops 5. spiritual nature (Ramkumar, 2019; The Hindu 9.10.2019) |
| 12 | <p>The technology for redgram transplantation has to be refined and given to the Director of Agriculture so that the cost benefit ratio is at desired level. A note on redgram transplanting technique is enclosed in Annexure 2.</p> | <p>Redgram transplanting technology is being redefined to reduce the cost and improve the adoptability by the farmers.</p> <ul style="list-style-type: none"> • The Redgram seeds can be sown in the Protray filled with coir pith instead of sowing in polybags and transplanted to the main field from 14 to 15 days. • All beneficial bioinoculants such as Pseudomonas, Trichoderma and Mycorrhiza can be integrated with the pot mixture |

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| |  <p>Red gram seedlings in pro trays (30 days old)</p> <p>Transplanting of red gram seedlings at</p> <p>Field experiment under drip irrigation</p> <p>Crop performance at 30 DAP</p> <p>(Action : DCM, DCPBG, TNAU; DOA)</p> | <ul style="list-style-type: none"> • Instead of taking pits, direct dibbling at optimum soil moisture can be preferred. • Normal irrigation instead of drip fertigation is suggested. • BRG 4 variety can be recommended as it gives more number of branches. • The improved technology package is tested in various locations RRS, Paiyur, RRS, Arupukottai, TNAU, Coimbatore |
| 13 | <p>Out of 385 Automatic Weather Stations established, only 100 are working. The data generated from the same should be sent by email on a daily basis to the Director of Agriculture who in turn will have to send it to the Commissioner of Revenue Administration and districts concerned. A detailed updated report is enclosed in Annexure 3.</p> | <p><u>TNAU</u></p> <p>As suggested in the 84th SWC on 19.8.2019, data generated from the 50 Automatic Weather Stations (AWS) are being provided by the ACRC to DOA with copy communicated to APC.</p> <p>The other AWS being physically verified, software checked and validated by the suppliers GeoEdge (161) and MAVIS Electronics (224). Until 24.11.2019, they have completed the work 161 and 224 units respectively. The work is in progress.</p> |



(Action: DCM; DOA)

On completion of the verification of all the 385 AWS, the repairs will be undertaken and further maintenance will be done by AED. The ACRC, TNAU will maintain the server and continue to provide agro-advisories based on weather parameters. The details will be presented on 8.11.2019.

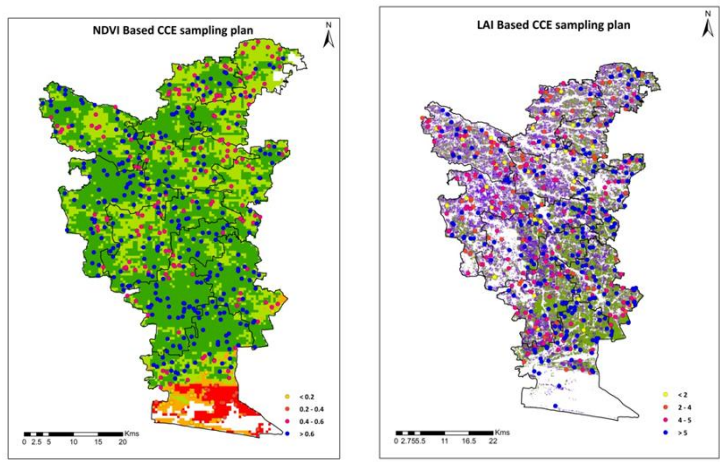
Director of Agriculture

The AWS data has been received since 02.11.2019 intermittently. In order to get the data on daily basis, it has been discussed over phone on 13.11.2019 with DCM & Head ACRC and learnt that the data could not be retrieved due to server error. Further it was also informed that the data will be sent to this office once the server issue resolved.

As the weather data obtained from presently working AWS are being integrated into TAWN portal maintained by TNAU. The principal secretary/ Chief Revenue Administration has been addressed vide this office Lr.No.G2/34644/14 date 18.11.2019 to peruse the block wise weather data uploaded in the TAWN portal (www.tawn.tnau.ac.in) on daily basis.

14 **Satellite based Smart sampling** to assess the crop out turn is done by TNAU. The approval of Government of India may be obtained for using the data. A proposal submitted to the DOA is enclosed in **Annexure 4.**

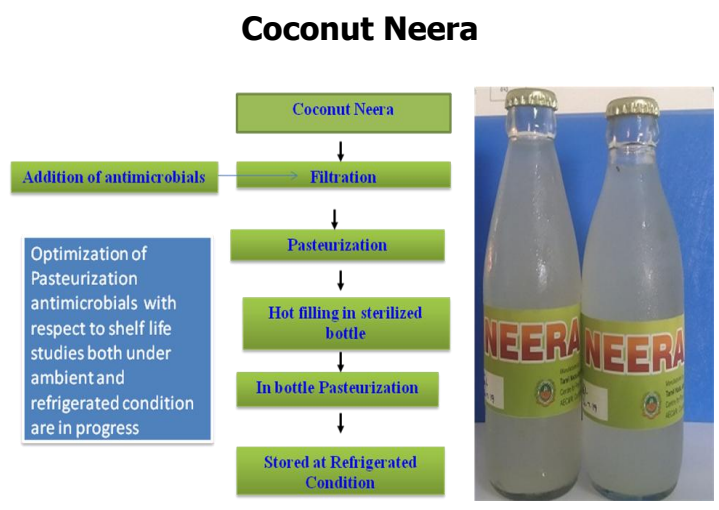
- A proposal has been prepared by TNAU to be sent to the National Crop Insurance Agency, Government of India through Director of Agriculture to enable us to use the satellite based smart sampling to assess the crop insurance.



- The Department of Remote Sensing and GIS has developed a **remote sensing based smart sampling methodology** for organizing and optimizing crop cutting experiments in Rice using homogeneity created by Start of the Season (SoS), Leaf Area Index (LAI) and Normalized Difference Vegetation Index (NDVI).
- The technology was approved by the Scientific Workers Conference (SWC) 2019 for adoption. As per the remarks of the SWC, a proposal has been submitted to the Government of India (MNCFC) through Director of Agriculture for approval and utilization in the PMFBY crop insurance scheme.


15 **Anti fermenting solution for preservation of Neera** needs to be standardized at the earliest.

In order address this, the TNAU has sanctioned **three mini-projects under ERDF** and the work is in progress (PHTC, AEC & RI, Coimbatore; Nanotechnology, DNRM; AC & RI, Killikulam)



PHTC, TNAU, Coimbatore

- Development of a technology for processing of Neera to enhance the shelf life using thermal methods along with chemical additives is in progress.
- The Neera tapped with Calcium carbonate and neera collected through ice box were taken for the study to enhance the shelf life. Optimization of pasteurization temperature and time with three levels of antifermenting agents (admissible limit) was done and storage study is in progress.

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| | <p style="text-align: center;">Membrane Filtration System</p>  | <p><u>AC & RI, Killikulam</u></p> <p>A device and technique has been standardized to preserve neera from palmyrah. The details are given below:</p> <ul style="list-style-type: none"> • Mini sequential membrane filtration model has been developed and the shelf life on Palmyrah Neera is being evaluated. • Pilot scale Palmyrah Neera production unit is being set up • Handy aseptic Palmyrah Neera collection device has been fabricated • Microbial preservative concentration for Palmyrah Neera preservation has been optimized. • For effective Neera collection from the farmers, development of mobile based software (Mobile App) is under progress. |
| 16 | <p>A wilt like disease is spreading in Gaja cyclone affected Coconut gardens in Thanjavur district. A team of scientist from TNAU have to be sent immediately to the district to assess it and recommend control measures. The JDA, Thanjavur will facilitate the visit. Detailed report is enclosed in Annexure 5.</p> | <ul style="list-style-type: none"> • The joint field visit of TNAU Scientists and Department officials was undertaken during August 29-30, 2019 in four blocks of Tanjore District namely Pattukottai, Madukkur, Peravurani and Sethubhavachatram. • The team inspected 5275 palms in 70 acres (before Gaja cyclone) and found 152 palms affected by wilt disease (2.88%). After the Gaja cyclone, 2170 palms survived in which none of the palms were infected. |



(Action : DCPPS, Dean (Hort), DOA)

- The joint field visit resolved that **there is no new 'wilt like disease' in coconut gardens** of Thanjavur District at present. General recommendations prescribed for wilt disease may be adopted scrupulously to improve the health status of the existing coconut plantations, while ensuring non-recurrence of such incidence in the near future.

17 Some of the **pesticides notified by the Central Insecticides Board** are not recommended by TNAU and some of them recommended by TNAU are devoid of notification by the CIB. Measures need to be taken to test and recommend new generation pesticides. A detailed list of chemicals recommended by CIB is enclosed in **Annexure 6**.

- **Central Insecticides Board:** The apex body to approve insecticide use in the country. Most of the newer molecules notified by CIB has been incorporated in the recently updated Crop Production Guides of both Agriculture and Horticulture. The TNAU has taken exception to synthetic pyrethroids and combinations of newer molecules to circumvent resurgence.
- **TNAU** is helping major insecticide providers by testing the newer molecules (> 30) singly or in combinations under "**bioefficay testing**" and the outcome of the data given to the sponsors which serve as a base paper to get the approval or notification by the CIB

18

Scientists of TNAU, KVKs and officials of agriculture department should **closely watch Fall Army Worm incidence in Maize in the Rabi season** and ensure that the damage is under control. Any incidence should be immediately reported.



The incidence of **Fall Army Worm** is closely monitored by a team of task force members in TNAU who closely work with the Department and KVKs.

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| Number of Districts under surveillance | : 31 |
| Number of diagnostic visits made | : 340 |
| Demonstration of technology capsule | : 120 in 6 Dts |
| Awareness programs | : 390 |
| Kisan melas organized | : 26 |
| Number of farmers sensitized | : 23,450 |
| Number of input dealers sensitized | : 2620 |
| Number of Extension officials sensitized | : 2170 |

Plant Protection

- Scientists of TNAU, KVKs and officials from Agriculture department are jointly monitoring the Fall Armyworm incidences every week.
- District level awareness programmes has been organized in all districts in co-ordination with TNAU scientists. Now Fall Armyworm incidence is under control.

19

Good **hybrid seeds of TNAU** such as Tomato Hybrid CO 3, Bhendi Hybrid CO 4, Chilli Hybrid CO 1, Bottle gourd Hybrid CO 1, Ribbed gourd COH 1, Snake gourd COH 1 are to be **multiplied in farmers field** with the help of TNAU scientists and Dept. of Horticulture officials and the hybrid seeds are to be made available to the State Department.




- A sum total of **2.498 tonnes of vegetable seeds** (TFL class) were supplied to the Department of Horticulture (from 1.4.2019 to 30.9.2019)
- Includes Tomato PKM 1, chilli Hybrid CO 1, Bhendi Hybrid CO 4, Pumpkin CO 2, Bitter Hybrid CO 4, Pumpkin CO 2, Bitter gourd CO 1, Ridge gourd COH 1, Snake gourd CO 2, Bottle gourd Hybrid CO 1, Small onion CO (On) 5, Annual Moringa PKM 1, Lablab CO(GB)14 and Amaranthus CO 1, CO 2 and CO 3.

20

Dean (Hort.) has to arrange to produce and supply required quantities of **Vegetable Grafts** particularly brinjal to DHPC. Research on Hydroponics to be intensified so as to develop the technology to suit Tamil Nadu.

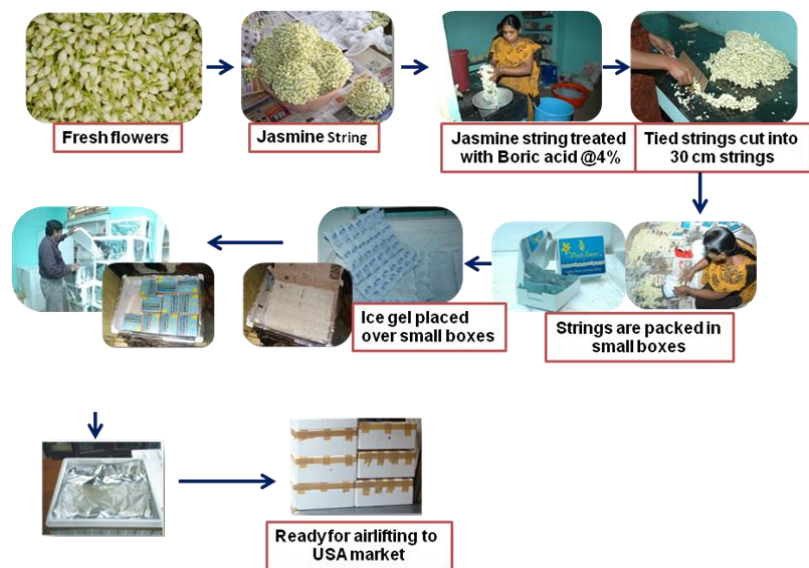


- The DHPC intended **5000 brinjal grafts** that were supplied as per the intent.
- About **40000 grafted brinjal** seedlings have been supplied to farmers as per the indent received from the farmers
- Research on hydroponics is in progress. A hydroponics model system has been established in TNAU orchard

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| 21 | <p>Onion variety CO 5 is well received by farmers except for its low shelf life. TNAU to work on this issue.</p>  | <ul style="list-style-type: none"> • Studies are being undertaken to extend the shelf-life of onion Co-5 using hexanal or 1-MCP vapours. • In the mean time, a new onion variety with an extended shelf life is proposed for release during this year (2019-20). It is a seed propagated variety |
| 22 | <p>In avocado, newer varieties and also rootstocks tolerant to wilt need to be introduced.</p> | <ul style="list-style-type: none"> • 2500 avocado grafts were produced with elite avocado clones of lower Pulneys including TKD-1, Hallen, Hass, Fuerte, Yellow and Thille for distribution to the Farmers. • Further 10500 rootstocks were raised for grafting of new avocado varieties including exotic types |
| 23 | <p>The protocol for packaging of Jasmine for Export purpose needs to be given to the Director of Horticulture & Plantation Crops. A detailed note of Jasmine packaging technology for export is enclosed in Annexure 7.</p> <p>(Action : Dean, Hort.)</p> | <p><u>Description of the technology</u></p> <ul style="list-style-type: none"> • Jasmine buds are harvested early in the morning before 7.00 am at fully developed tight bud stage and the buds are tied into strings and cut into pieces of 30 cm length each. • The strings are dipped in 4% boric acid and surface dried. • For long distance markets, five pieces of strings are packed in a small aluminium lined cardboard box of dimension 11 x 13.5 x 4 cm and further lined with butter paper. |

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| | | <ul style="list-style-type: none"> • Twenty four such boxes are in turn packed in a larger thermocol box of dimension 60 x 45 x 30 cm lined with aluminium foil (in 3 layers with 8 boxes per layer) and ice gel sheets are placed in between each layer and the top layer is covered with aluminium foil. • The boxes are closed and covered with brown sealing tape after which the packages can be airlifted. • For short distance markets, 1 kg of strings are packed in corrugated fibre board boxes (24 cm X 24 cm X 24 cm) with 4 % ventilation and lined with butter papers, sealed and airlifted. <p>Impact of the technology M/S. Vanguard Exports, Coimbatore, is exporting fresh jasmine flowers to US market. The cost benefit ratio of 1:2.44. The adoption of export packaging technology has helped to reduce post harvest losses in jasmine from 40 to 10%. Further, 6 more exporters will adopt the technology.</p> |
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Long Distance Transport



Local Market



24

Analyzing the reasons for decrease in Area / Production / Productivity of crops like 1.Paddy 2.Pulses 3.Groundnut 4. Sunflower and 5.Vegetables in the major district of Tamil nadu and providing concrete suggestions to bridge the gap. A detailed analysis is reported in **Annexure 8**.

(Action : Director, CARDS)

Scenarios in TN during 2007-2017

| Crop | Area | Production | Yield |
|-----------|-------|------------|-------|
| Rice | -0.43 | +0.62 | +2.08 |
| Blackgram | +4.85 | +16.0 | +10.6 |
| Greengram | +4.22 | +13.2 | +8.69 |
| Groundnut | -8.77 | -9.50 | -0.81 |
| Sunflower | -15 | -21.9 | -8.30 |
| Brinjal | +8.5 | +7.93 | -0.81 |
| Bhendi | +10.6 | +10.5 | -0.16 |
| Tomato | +0.05 | +1.49 | +1.46 |

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| 25 | <p>Impact Evaluation of Micro Irrigation and Solar powered pumping systems, Water Harvesting Systems created under Mission on Sustainable Dryland Agriculture and Solar driers schemes need to be taken up by CARDS, TNAU. A proposal in this regarding is requested.</p> <p>(Action : Director CARDS; DAE, Dean Ag. Engg)</p> | <p>Micro-irrigation & Solar powered pumping systems</p> <p>The District wise solar pump installed and beneficiaries details were collected from AED, Chennai. The study covers 10 % of the total beneficiaries 220 numbers (60 fixed type solar pumps, 160 track type solar pumps) in nine districts. Survey of 60 beneficiaries completed.</p> <p>Water Harvesting System Created under MSDA</p> <p>The details about water harvesting system created, clusters and completed works were collected from AED. The study was initiated.</p> |
| 26 | <p>Wide publicity should be given about the activities of Agri Business Incubation Centre. Plan of action with a vision for the next one year needs to be prepared by getting inputs from various directorates. The Agri Business scientists should be made to pay a visit to the Primary Processing Centres established under the Supply Chain Management scheme. Details in Annexure 9.</p> | <p>The Agri-Business Incubation Centers in operation in 5 locations namely Coimbatore, Madurai, Trichy, Killikulam and Mettupalayam.</p> <p>Publicity</p> <ul style="list-style-type: none"> • Before the commencement of all programs, publicity is given in print media, TNAU website, Incubation Forum Website, and social media • TNAU Incubatees Product Expo is proposed to be held during Feb- Mar, 2020 • Technology expo planned during Jan- Feb, 2020 • Plan of action for DABD based on its Vision is being prepared |



(Action : Director ABD; CAM & AB)

Visit to PPC

- Visited PPC at Manachanallur for Onion and Banana and interacted with Mr Sugumar, Secretary, Market Committee

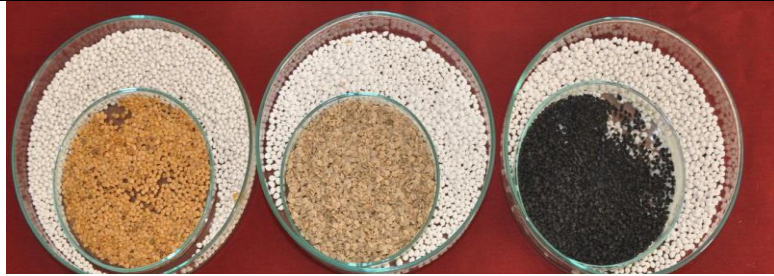
TNAU Technologies passed on to ABD / CAM-AB

- DPR is prepared 9 technologies

New initiatives

- "AGPREUN IDEATHON CHALLENGE 2019" to promote student entrepreneurship.
- Capacity building programme on " International Business Procedure"
- Organized five days residential training on "Coconut Farmers on Entrepreneurship Development" sponsored by Coconut Development Board, Chennai for 20 farmers.
- Two trainings on Agricultural Export and Import were given to 36 participants.
- Conducted RKVY-R-ABI- Agriprenurship Orientation Programme and 19 trainees were supported with a stipend of Rs. 10,000 per month for 2 months and their proposals were sent for screening to the MoAFW, New Delhi. If selected, the applicants will get grant up to Rs. 5 Lakhs for product development.
- R-ABI startup Agri- Business Incubation Programme was inaugurated and 25 startups were attending this training for 2 months.

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| | | <ul style="list-style-type: none"> • MoU signed between TNAU and M/s. Farmgate India, Chennai for supply chain management of vegetables. • Proposal for establishing BioNEST at TNAU was presented to BioNEST National Committee, Birac at Ahmedabad during August, 2019 <p>There are three major upcoming activities scheduled by the ABD that include Technology Expo, Business Incubation Innovation Expo and Commercialization of technologies developed by various directorates.</p> <p>A circular has been sent to all directorates to scout the potential technologies for commercialization. Further, marketing potentials of value added products developed by the Community Science College & Research Institute, Madurai, being evaluated prior to commercialization.</p> |
| 27 | <p>Training on Seed pelleting needs to be given to the officials/staff of Department of Agricultural Marketing and Agri Business. Details in Annexure 10.</p> | <ul style="list-style-type: none"> • Trainings on seed quality enhancement techniques including seed pelleting and coating were given to seed producers and farmers during October 3-4, 2019 and to the Officials of Department of Agriculture on during October 30-31, 2019 under NABARD funding. • A training proposal on "Value addition of seeds through seed pelleting technique" has been submitted to the Commissioner of Agricultural Marketing & Agri Business, Chennai for funding to offer training to the officials |



(Action : Director, Seeds; CAM & AB)

Training to Farmers and Seed producers



Training to Officials of Department of Agriculture



28 **Small models for Sugarcane harvesting** should be envisaged to help sugarcane growers having small holdings. For de-trashing of cane also suitable machinery may be developed.

(Action : Dean Ag.Engg; DAE)

Mini-sugarcane harvester suitable for small land holdings were attempted across the country but in vain. The TNAU has tied up with a private industry Gomathy Engineering Industries, Erode, to develop small sugarcane harvester. The tractor power (75 HP) is not enough to operate the harvester and failed to progress further.

The factors identified by TNAU is being incorporated and redesigned by CIAE involving private industry and TNAU.

Manually operated de-trasher has been developed and being used by farmers

29

Ground nut seed drill developed by TNAU and modified as a paired row former cum seed drill by a farmer in Tindivanam needs to be studied by TNAU scientists for its effectiveness and reported.

(Action : Dean Ag.Engg; DAE)



The tractor operated seed drill consists of raised bed former, seed sowing attachment and fertilizer applicator. Raised bed former can form the raised bed of 55 x 25 cm. The fluted roller metering mechanism is used for metering the groundnut seeds and also fertilizer thereby rate of application can be easily adjusted. Three ridgers mounted at the front of the unit gives soil flow required to form two raised beds on which groundnut seed are sown in four rows.

Seed tubes from the bottom of the seed hopper placed in between the ridger and raised bed roller. The compaction roller assembly provided at the rear end, compact the soil and forms the bed after the sowing of seeds.

The demonstration of the tractor operated raised bed seed drill for sowing groundnut was conducted at Oil Seed Research Station, Tindivanam on **08.08.2019**. Dr. Valliammai, Assistant Professor (SWC), ARS, Bhavanisagar and Dr. B.Suthakar, Asst. Prof. (Farm Machinery), AEC&RI, TNAU were witnessed the demonstration plot and assessed the performance of the tractor operated raised bed seed drill for groundnut.

The groundnut crop already shown on **19.07.2019** using the tractor operated raised bed seed drill for sowing groundnut was examined. The row to row spacing between narrower row and wider row were measured. The plant to plant spacing was also measured. Plant population per square meter was measured and recorded.


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| <p>30</p> | <p>Design aspects gravity flow MI system need to be furnished to the Chief Engineer, Agricultural Engineering Department.</p> <p>(Action : Dean Ag.Engg; DAE)</p> | <p><u>Gravity flow Micro Irrigation System</u></p> <ul style="list-style-type: none"> • To operate the drip Irrigation System, the optimal pressure requirement at the end of lateral is 1 kg per sq.cm which is equivalent to 10 m of water column • To operate the drip system in kitchen garden of small area without filter arrangement, water tanks available in the house can be utilized for low discharge. • To install gravity flow drip irrigation in field condition with primary and secondary filters along with fertigation system, the pressure of water prior to filter arrangement must be around 2.5 kg per sq.cm which is equivalent of 25 metre above the head control unit. The cost of construction of overhead tank of sufficient capacity to a height of 25 m, is very high. If the level difference between water source and field to be irrigated is about 25 m, which would be prevalent in the hilly area, the operation of drip system in gravity flow is possible. The growth of algae in surface level tank or overhead tank are usually high and the installation of media filter along with secondary filter is very essential under these conditions. • If the pressure of Irrigation water prior to filter system of 2.5 kg per sq.cm is ensured, the present existing design procedure of main pipe, sub-main and lateral can be adopted for gravity flow drip irrigation system also. |
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| Other Recommendations | | |
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| 31 | <p>The protocol for Palmyra cultivation has to be given to DoA and DHPC. Detailed protocol is enclosed in Annexure 11.</p> <p>(Action : Dean, AC & RI, KKM; Dean, ADAC & RI, Trichy; DHPC)</p> | <p style="text-align: center;"><u>Protocol for Palmyra cultivation</u></p> <p>Pit size: 60 x 60 x 60cm</p> <p>Spacing: 3 x 3m</p> <p>Filling the pits : FYM or compost @ 2 to 3 kg/pit</p> <p>Seeds: Extract from fully ripened fruits</p> <p>Sowing: Seeds @ 2 to 4 seeds/pit</p> <p>Season: Monsoon seasons (or) pot watering</p> <p>Germination: 105-110 days, goes up to 24 months (85%)</p> <p>Thinning: After 2 years, one seedling/pit</p> <p>Manure and Fertilizers: 10 Kg of Farm Yard Manure /pit before planting the nuts. The dosage may be increased biannually till reaching 60 Kg FYM/pit/year</p> <p>Yield : Padneer – 200 – 400 litres (February-May)</p> <p>MSDA</p> <ul style="list-style-type: none"> • Protocol for Palmyra Cultivation received from TNAU and the same is communicated to district Joint Director of Agriculture for necessary follow-up. |

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| 32 | <p>Release of traditional varieties like Seeraga samba and Mapillai samba as pure varieties within a minimum possible time frame (Action : CPBG & CPMB)</p> | <p>Seerga Samba : Improved version of seeraga samba was released last year as VGD 1 which is being popularized through Seed supply chain and Traders</p> <p>Mapillai Samba: Genotypes have been collected and purification is in progress. It may take 1-2 years before it can be recognized as a variety</p> <p>Kauvni : It is a therapeutic rice which as been improved over the years and it being tested in MLT. Next year, it will be given for testing in farmers fields</p> |
| 33 | <p>A discussion with HoDs and the VC and Directors of Directorates of TNAU under the Chairmanship of the APC & PS on the action taken on SWC deliberations need to be arranged once in 3 months. The meeting may be arranged either in Chennai or in Coimbatore as per the convenience of the APC & PS & Vice Chancellor, TNAU</p> | <p>As suggested in SWC 2019, a follow up interim review meeting for the 84th Scientific Workers' Conference is scheduled to be held in Chennai on 26.11.2019</p> |
| 34 | <p>TNAU to have model fields at KVKs and TNAU Research stations (minimum one acre) in the respective district for a particular variety. The Extension functionaries and farmers should visit the fields and assess its performance.</p> <p>Demonstration Plot of Maize Hybrid COH(M)8 and COH(M)6 at CRS VPT on 12.11.2019.</p> | <p>The Director of Research and Director Extension Education instructed all Research Station Heads and KVK Co-ordinators to exhibit model farms to portrait TNAU varieties and technologies. The model farms available across the State is furnished below:</p> |



1. **DARS, Chettinad, Sivagangai District**
Dryland technologies, sivi-pasture - horticulture systems, solar pump, machineries for Value added products
 2. **ARS, Bhavanisagar, Erode District**
Groundnut BSR 2, Complete Farm mechanization in Rice
 3. **RRS, Tirur, Thiruvallur District**
Rice variety (TKM 13)
 4. **TCRS, Yethapur, Salem District**
Castor varieties (YRCH 1 & 2, YTP 1) Tapioca (Me 681)
 5. **ARS, Vaigai Dam, Theni District**
Seera samba (VGD 1)
 6. **RRS, Arupukottai, Virudhunagar District**
Assemblage of Arid Fruits, Composting of organic wastes
 7. **ARS, Kovilpatti, Thoothukudi**
Dryland technologies, sorghum varieties (K 12), IFS
 8. **RRS, Paiyur, Krishnagiri District**
Rice SRI technique with Paiyur 1 variety, High density planting in mango
 9. **SRS, Cuddalore**
SBI sugarcane variety Co. 11015 (Atulya) and identified clone for CVRC release CoC 13339 (C 29442)
 10. **SRS, Sirugamani**
Sustainable sugarcane initiative (SSI)
 11. **HC & RI, Periyakulam**
High density planting in Guava
 12. **FC & RI, Mettupalayam**
Multi-functional agro-forestry
- All **14 KVKs** have demo plots with respect the region

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| | | <p>ATMA</p> <ul style="list-style-type: none"> • TNAU has informed that during 2019-20, KVKs have established model fields (<1ac) for the latest /newly released varieties and instructed the KVKs to invite extension functionaries in their district periodically to visit the model field /demo units at KVKs. • Necessary instructions have been given to all district JDAs to take the farmers on Exposure visit to one acre model fields laid in the nearby KVKs in their district vide ref ATMA2/108070 /2019, dt:4.9.19 and 11.11.19. |
| 35 | <p>Centres of Excellence of TNAU should have close association with the Departments of Agriculture & Horticulture.</p>  | <ul style="list-style-type: none"> • The Dryland Agricultural Research Station (DARS), Chettinad, is well equipped with various silvipastoral models, dryland technologies besides excellent infrastructure. This was developed under Center of Excellence funded by NADP. • The JDA of Sivagangai is conducting Zonal Workshop in DARS, Chettinad |
| 36 | <p>Evolving short duration (90 - 95 days) high yielding and drought tolerant rice varieties for different agro-ecological situations of Tamil Nadu.</p> | <ul style="list-style-type: none"> • The rice varieties ADT 48 and MDU 5 mature in 95 days under direct seeds & 100 days un transplanted condition. Research efforts are underway to evolve early maturing rice varieties. |

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| 37 | <p>Suitable saline tolerant paddy varieties for coastal Districts of Tamil Nadu. The three salt tolerant varieties (TRY 1, TRY 2 and TRY 3) released by TNAU need to be popularized and adopted. Among these three varieties, TRY 1 & TRY 3 medium (135 days) whereas TRY 2 matures in 105-110 d. Large scale demonstration can be taken up in Nagapattinam District during April - May 2020 in collaboration with KVK, Needamangalam</p> | <ul style="list-style-type: none"> • The Dean (ADAC&RI), Trichy would organize for FLDs on request from JDA, Nagapattinam. Sufficient quantity of seed material is available at ADAC&RI, Trichy for the conduct of trials. • The Paddy variety TRY1 and TRY2 are more than 10year old and also not preferred by the farmer. • In the identified salt affected area of 3400 ha it is programmed to organize demonstration with salt tolerant variety TRY3 notified during 2012 (less than 10 years) to an extent of 200 ha in the blocks of Thirumurgal, Sirkali, Kollidam, Sembanarkoil, Kilvelur, Nagai, Keeliyur, Vedaranyam and Thalainayur of Nagapattinam district. The cultivation of the variety will be taken up during demonstration 2020 through direct seeding. • Action plan has been communicated to the Director of Research, Director(CPBG) and Professor and head, Needamangalam vide this office Lr.No P&M 4/85875/2018 dated.22.10.19. |
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| Action plan for organization demonstration with saline tolerant varieties in Nagapattinam District during 2020 | | | | | |
|---|--|--------------------------------------|--|----------------|----------------------------------|
| S. No. | Block | Salt affected Total Area (ha) | Area identified for Demonstration (ha) | Variety | Qty of Seed Required (kg) |
| 1 | Thirumurgal | 300 | 20 | TRY 3 | 800 |
| 2 | Sirkali | 450 | 25 | TRY 3 | 1000 |
| 3 | Kollidam | 400 | 25 | TRY 3 | 1000 |
| 4 | Sembanarkiol | 400 | 20 | TRY 3 | 800 |
| 5 | Kilvelur | 250 | 20 | TRY 3 | 800 |
| 6 | Keeliyur | 300 | 20 | TRY 3 | 800 |
| 7 | Vedaranyam | 500 | 25 | TRY 3 | 1000 |
| 8 | Thalainayur | 500 | 25 | TRY 3 | 1000 |
| 9 | Nagapattinam | 300 | 20 | TRY 3 | 800 |
| TOTAL | | 3400 | 200 | | 8000 |
| 38 | Fall Army Worm (FAW) resistant genotypes need to be identified from indigenous or exotic sources. | | <p>A trial was conducted during <i>kharif</i>19 season with 19 entries comprising of nine TNAU hybrids, two private hybrids and eight inbreds under uncontrolled condition. Natural incidence of FAW was observed on 28 Days After Germination. None of the entries was found to be resistant. The ear damage score will be taken up at the time of harvest.</p> <p>In addition, few seeds of three lines which were said to be tolerant to FAW were received from CIMMYT and the seed multiplication is taken up during <i>kharif</i>19. Two wild species viz., <i>Zea mays ssp parviglumis</i> and <i>Zea luxurians</i> were also collected through Indian Institute of Maize Research, Ludhiana for testing against FAW</p> | | |

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| 39 | <p>TNAU variety suitable for red gram transplanting is Co. 8. However, there is an urgent need to screen high yielding varieties suitable to Tamil Nadu conditions. The BARC variety can be tested to provide relative performance. The FLDs may be conducted in Dharmapuri and Krishnagiri Districts</p> | <p>BARC redgram variety BRG 4 has been included. Experiment is in progress</p> |
| 40 | <p>The performance of TNAU YMV resistant varieties (VBN 6 & VBN 8) can be compared with a BARC variety (TU 94-2) and their performance may be tested in summer. The TNAU variety VBN 8 has been proved to perform better in summer of Cauvery Delta Zone.</p> | <p>The seeds of TU 94-2 have been multiplied at NPRC, Vamban & the same would be compared with VBN 6 & VBN 8 during summer (April-May 2020) for its YMV resistance. The variety VBN 8 is being multiplied in regular Seed Chain Supply system as well as in TNAU Pulses Seed Hub.</p> |
| 41 | <p>Research is required to improve the Shelf life of Groundnut seeds.</p> | <p>To maintain the storability of groundnut seeds, the pods should be dried to a moisture content of 8% and stored in gunny bags along with Calcium Chloride @ 250 g per 30 kg of pods (or) the pods should be dried to a moisture content of 6% and stored in super grain bag.</p> <div data-bbox="1290 935 1912 1190" data-label="Image"> </div> <ul style="list-style-type: none"> • Further, it is programmed to study the suitability of nano zinc oxide @ 1g kg⁻¹ kernel treatment for maintaining the storability of groundnut kernels. |


42 TNAU should produce and supply adequate quantities of Pink Pigmented Facultative *Methylobacterium* (PPFM) in drought prone areas. The possibility of commercializing this technology needs to be explored.






Pink Pigmented Facultative Methylobacterium (PPFM)
 Department of Agricultural Microbiology, TNAU, Coimbatore has produced **152.4 kg** of lignite based formulations and **31375.5 litres** of PPFM for the last six years.

Rapid mass production of PPFM low cost medium i.e. glycerol peptone medium supplemented with 0.5 methanol has been standardized. This department is willing to mass produce PPFM as per the demand received from stake holders

| Formulation | 2013-14 | | 2014-15 | | 2015-16 | | 2016-17 | | 2017-18 | | 2018-19 | |
|-------------|--------------------|------------|--------------------|------------|--------------------|------------|--------------------|------------|--------------------|------------|--------------------|------------|
| | Carrier based (kg) | Liquid (L) | Carrier based (kg) | Liquid (L) | Carrier based (kg) | Liquid (L) | Carrier based (kg) | Liquid (L) | Carrier based (kg) | Liquid (L) | Carrier based (kg) | Liquid (L) |
| Quantity | 35 | 21,212 | 70 | 572 | 4.4 | 379 | 20 | 6370.5 | 5 | 1849 | 18 | 993 |
| Grand Total | | | | | | | | | | | 152.4 | 31375.5 |

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| <p>43</p> | <p>Zinc solubilizing liquid biofertilizer may be developed and demonstrated</p>  <p>The diagram illustrates the zinc uptake and soil availability for rice plants. It shows three bottles of zinc solubilizing liquid biofertilizers: ZSB14, MDU1, and TNAU 1. The diagram also shows a rice plant with arrows indicating the following values:</p> <ul style="list-style-type: none"> Grain Zinc: 23 mg/kg (ZSB14) and 11 mg/kg (MDU1) Zinc uptake: 210 g/ha (ZSB14) and 138.2 g/ha (MDU1) Soil available zinc: 15-5 mg/kg (ZSB14) and 1-0.8 mg/kg (MDU1) | <p>Development of zinc solubilising liquid biofertilizer</p> <p>The TNAU has developed a bacterial zinc solubilisation bioinoculant technology to improve zinc use efficiency and biofortification of rice.</p> <p>Potential Zn solubilisation strains ZSB14 (<i>Enterobactor cloacae</i>) and ZSB15 (<i>Pseudomonas chlororaphis</i>)</p> <p>Method of application</p> <ul style="list-style-type: none"> • Seed treatment : 125 ml/ha of paddy seeds • Seedling dip : 500 ml/ha of seedlings • Soil application : 500 ml/ha |
| <p>44</p> | <p>Multi-micronutrient liquid formulation for drip fertigation may be studied</p> | <p>Formulation of multi micronutrient liquid formulation for drio fertigation</p> <ul style="list-style-type: none"> • Multi micronutrient liquid formulation comprising of Zn, Fe, Cu, B, Mn and Mo has been developed. • Nutrient contents of this liquid formulation were analyzed. • Evaluation of liquid formulation of multi micronutrient as foliar nutrition for paddy, green gram and cotton are in progress. • Standardization of fertigation levels of liquid multi micronutrient will be taken up during the ensuing cropping season. |

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| 45 | <p>Drip irrigation in different ecosystems of rice may be explored (Action: AED; Director WTC)</p> | <p>Based on the experimental results "Drip biofertifigaion" in aerobic rice" as technology for adoption was proposed from Water Technology Centre.</p> <p>Under the Project "Demonstration of Drip biofertifigation in aerobic rice" funding under NADP demo plots for both surface and drip-biofertifigation was proposed in 28 state seed farms and it was proposed in 28 state seed farms and it was proposed to demonstrate in the farmers field in 244 blocks of Tamil Nadu it was also proposed to conduct pilot base demonstration on drip irrigation in rice through KVKs@100 acres per KVK in the deltaic region</p> <p>Under TNIAMWARM, Drip fertigation for rice crop was done during 2010-2012. The outcome of the experiments proved positive results. The concept of drip fertigation in rice is being adopted by nearly 50 farmers in and around Govindapuram village, Dharapuram block.</p> |
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| 46 | Necessity of De-topping for bud chip seedling planting | The practice of detopping of chip budded sugarcane seedlings is being recommended between 20 – 25 days after planting in the main field <i>i.e.</i> after the emergence of one to two tillers from the mother shoot . This helps to enhance the seedling vigour and tillering ability through production of starch <i>i.e.</i> increase in invertase enzyme productivity, and it also enhances the chlorophyll efficiency through the activity of ADP glucose in the chloroplast which might have ultimately resulted with sustainable cane yield |
| 47 | <p>The popular Mundu type chillies need to be purified and made available to Ramnad area.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Chatti Mundu</p> </div> <div style="text-align: center;">  <p>Oosi Mundu</p> </div> <div style="text-align: center;">  <p>Sathura Mundu</p> </div> </div> | <ul style="list-style-type: none"> • 41 single plant selection of mundu type chilli obtained from Ramanathapuram is under purification at HC&RI, TNAU, Coimbatore and HC&RI, Periyakulam and VRS Palur. At Coimbatore planting of above accessions was done on 05.09.2019. The plants are in vegetative stage. • Forty Seven Mundu chillie genotypes from different regions of Tamil Nadu were collected from Ramanathapuram, Kadaladi, Thoothukudi, Paramakudi and Vilathikulam. Among the genotypes PKMCA-08, PKMCA-21, PKMCA-25, PKMCA-32 and PKMCA-38 were found to be the promising genotypes with dry fruit yield of more than 180g/plant. Purification of mundu type chillie geno types are in progress. |

48

A **red pulp guava variety (Cv. Arka Kiran)** released by IIHR, Bangalore needs to be popularized.



- Action has been taken to get the details on characteristics and cultivation packages specific to Guava var. Arka Kiran from Division of Fruit Crops, IIHR, Bangalore for publication in local language.
- Action was taken for multiplication of planting materials of Guava var. Arka Kiran at College Orchard, TNAU, Coimbatore.
- Action has been taken for making popularization of Guava var. Arka Kiran through Popular Articles / Pamphlets / Air / Doordarshan / Exhibition.
- Arrangements were made to conduct a field day to popularize Guava var. Arka Kiran in Tamil Nadu.

Additional Points from Dept.of Horticulture, Chennai

From the mother plants layers propagated from the following SHFs.

Poonjuthi, Madurai – 600 Nos.

Poovani – 300 Nos.

- Layering yet to be commenced in SHF Vallathirakottai, Neyveli, Baguthampalayam and Thally since planting of mother plants was taken during August – September.
- It is programmed to plant Arka Kiran and flesh Guava in all SHF within the period of 6 months based on the availability of planting materials.
- Parameters for selection of nematode free planting material received and communicated to District officers. It is being followed while procuring plants.

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| 49 | Dean, AC & RI, Killikulam may supply available fruits for needy institutes Technologies may be developed for off-season flowering in jasmine under low cost polyhouse conditions | Status of availability of seed Nuts Seedlings: Seeds of Palmyrah 40,000 were collected and sown for mass multiplication and thousand seedling are ready for distribution to needy people. |
| 50 | The suggested effective Technology Capsule for controlling wilt disease in avacado may be included under any scheme so as to reach to the farmers of Lower Palani hills. | Newer varieties and root stocks tolerant to wilt needs to be introduced. Evaluation is in progress. |
| 51 | Documentation of Market preference of TNAU released varieties is to be taken up for large scale adoption and popularization of TNAU varieties among the farmers. | Documentation is in progress |
| 52 | Mechanical harvester for small holdings, seedlings and setts planter, mechanized detrashing machine need to be developed for sugarcane cultivation. | |
| | <p>a. Tractor drawn Deep furrow sugarcane cutter planter with herbicide sprayer</p> <p>The IISR planter plants two rows of sugarcane at a time in deep furrows. The planter consisted of two deep furrow openers, sharp edged blades to cut the cane into 350 mm long pieces as seed material. The length of sett cut is governed by the PTO speed.</p> <p>The machine performs the following operations simultaneously</p> <ul style="list-style-type: none"> • Opening up a deep trench of 15 to 25 cm • Cutting of the sugarcane setts by means of PTO powered cutter • Spraying the setts with fungicide • Collecting soil from either side to cover the setts and form shallow furrows on either side. • Compact the furrow by means of a roller compacter • Spray weedicide behind the planter • Effective field capacity is 0.20 ha/h • Field efficiency of the planter is about 85 % | |

- Cost of operation is Rs. 4000 per ha
- Cost of the machine is Rs. 125000



b. IISR Tractor operated Disc type ratoon management device for sugarcane

Sugarcane Ratoon management device was developed by IISR, Lucknow which executes all the operations involved in management of ratoon crop such as stubble shaving, deep tilling, off-barring, placing manure, fertilizer/bio-agents, chemicals in liquid form and earthing up operations in a single pass of operation. It has capacity of 0.35-0.40 ha/hr and saves 60% of the cost of operation. The cost of the machine is Rs. 1,15,000/-



c. Two row tractor drawn mechanical planter for sugarcane bud chip settlings raised in protrays

Sugarcane bud settling planting is a new method of sugarcane planting and is gaining popularity. In this technique, the bud along with a portion of the nodal region is chipped off and planted in raised bed nurseries / protray / polybags filled with FYM or press mud, soil and sand at 1:1:1 proportion. Seed material required under this technique is only 1 to 1.5 t/ha and the remaining cane after taking bud chips can be sent formilling / jaggery. It also facilitates easier handling and transportation. A two row tractor drawn mechanical planter for sugarcane bud chip settlings raised in protrays has been developed by ICAR Central Institute of Agricultural Engineering, Regional Centre, Coimbatore in collaboration with ICAR - Sugarcane Breeding Institute, Coimbatore, Tamil Nadu.

The equipment consists of

- Mainframe to be attached to standard three point hitch arrangement of a 40 hp tractor with adjustable arrangement for altering row to row spacing 90, 120 and 150 cm.
- Bud chip settlings to be dropped through the metering mechanism by two operators who are seated behind the equipment with adjustable arrangements for altering plant to plant spacing of 30, 45 and 60 cm.
- Furrow openers open the furrow, in which the settlings with soil are to be planted with adjustable arrangement for altering depth of planting 2 to 6 cm. The same furrow is used for irrigation after the settlings have been planted for better establishment.
- The furrow closer which follows the soil opener closes the soil thereby giving stability to the settling plants.



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| <p>d. Efforts need to be taken to introduce the Groundnut harvester developed by TNAU to the farmers.</p> | <p>POS</p> <ul style="list-style-type: none"> • A detailed letter has been sent to TNAU requesting to furnish various information on the groundnut harvester and also the feasibility to provide demonstration in farmer's field of groundnut growing districts. • Based on this, the Department of Farm Machinery and Power Engineering, AEC&RI, Coimbatore was conducted a demonstration of Tractor operated PAU model groundnut digger, Commercial model groundnut diggers(NIPHA) and Groundnut Stripper at Perundurai Block, Erode district on 01.11.2019. We participated in this demonstration along with officials of KVK and officials of Agricultural Engineering Department, and Department of Agriculture Participated in the demonstration. • PAU model Groundnut digger is found to be suitable to our condition. But a machine for harvesting and another machine to separate the pods are not feasible to farmers. <p>The Director of Agriculture has suggested a Combined Harvester to harvest the Groundnut plants and separate the pods in the same machine for promotion amongst farmers</p> |
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| 53 | <p>Standard Operational Protocol (SOP) for organic production of agricultural and horticultural crops besides mulberry cultivation may be provided</p> | <ul style="list-style-type: none"> • SOPs for organically grown agricultural crops such as rice, maize, cotton and sunflower have been standardized and incorporated in CPG 2019. • Organically grown horticulture crops (Beet root and chillies) have been finalized to be included in CPG 2019 • Organic mulberry cultivation is under evaluation. • SOPs for 14 hilly organic vegetables have been compiled for field evaluation • One day free Workshop on "Organic input Production" was given to farmers (100) in Chennai |
| 54 | <p>Seed Procurement Problems faced by TNAU need to be addressed. (Proceedings in Annexure 12)</p> | <p><u>Resolutions at the TNAU Meeting</u></p> <p>A joint discussion meeting between TNAU and TANSEDA Officials was held at the Directorate of Research, TNAU, Coimbatore on 11.10.2019 to finalize the modalities of seed programmes of TNAU and TANSEDA. The following resolutions were taken in the meeting:</p> <p>1. Providing production and distribution subsidy (to farmers) for the seeds produced by TNAU in farmers field</p> <ul style="list-style-type: none"> • The committee suggested TNAU to send a proposal to the government through Director of Agriculture to allot a portion of subsidy amount to the farmers who enrolled for seed production in TNAU. |

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| | | <ul style="list-style-type: none"> • Further, the same may also be addressed to the Agriculture Secretary and Joint Secretary (Seeds), GOI to issue guidelines and to allot funds for providing subsidy to seed growers registered under TNAU. • Similar proposals may also be considered under NADP / NFSM schemes of the Government of Tamil Nadu for providing financial assistance for seed production subsidy on project mode as practiced in Gujarat state <p>2. Inclusion of TNAU seed production programmes (Seed hubs) as a part of Seed Rolling Plan of TANSEDA</p> <ul style="list-style-type: none"> • The committee suggested that there can be indent finalization meeting with TANSEDA Officials for foundation and certified seeds also during the month of April every year as followed for breeder seeds. The pulses and oilseed production programme of TNAU shall be considered as advance indent and included as a part of TANSEDA Seed rolling plan <p>3. Inclusion of TNAU released varieties (less than 5 years) in Minikit Programmes of Government</p> <ul style="list-style-type: none"> • The list of TNAU varieties (less than 5 years of release) of pulses, oilseeds and nutri-cereals may be prepared by the Director (CPBG) and informed to the Director of Agriculture for further transmission to Government of India to include in Minikit programme |
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| | | <p>4. Adoption of uniform procurement and sale price of seeds with subsidy both by TNAU and TANSEDA</p> <ul style="list-style-type: none"> • A suggestion was made to adopt uniform procurement and sale price both by TNAU and TANSEDA in future based on MSP / LMR. The procurement price has already been revised by TNAU on a par with TANSEDA procurement price. • The sale price of pulses and oilseeds may be revised as 25% higher than procurement price (Procurement price + 25% of procurement price) by TANSEDA instead of 15% higher than procurement price. |
| 55 | Annual / perennial varieties of mulberry and castor with high nutritious value and leaf yield need to be recommended for silk worm rearing alternate to mulberry. | <p>G4 variety is recommended in the place of V1 for mulberry tracks</p> <p>GCH 4 and DCH 519 castor varieties are recommended for Eri culture in Tamil Nadu</p> |
| 56 | Comparative Studies on bush type and tree type mulberry for silkworm rearing may be attempted | <p>Tree type mulberry planting is to be taken up at ARS, Bhavanisagar, for comparison with bush type mulberry (One year old tree type mulberry in 2 acres only available at Tiruchengode, Tamil Nadu).</p> |

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| 57 | The improved varieties of Agro-forestry tree species such as Kadam - MTP 1 and <i>Melia dubia</i> MTP 1 need to be introduced in all state farms so as to popularize their cultivation | <p>TANSEDA</p> <p>It has been programmed to grow both the tree species @ 20 each in all the State seed farms and accordingly Indent has been placed to Agricultural College and Research Institute (AC & RI), Mettupalayam, Coimbatore to supply 800 Nos. of Kadam MTP 1 saplings and 800 Nos. of <i>Melia Dubia</i> MTP 1 saplings at the earliest.</p> |
| 58 | Supply of TNAU Groundnut Rich [Director of Agriculture, Chepauk, Chennai] | <p>Recommendation /acre Foliar spray @ 2 kg / acre at peak flowering and pod development stages, Total : 4 kg / acre</p> <p>Method of application 2 kg of TNAU Groundnut Rich should be dissolved in 200 litres of water and applied as foliar spray. Foliar application can be done either in the early morning or at the late evening, mixing with sufficient wetting agent using knapsack sprayer, to attain better result</p> <p>Benefits of spraying Groundnut Rich Boosters It decreases the flower shedding, improves pod filling and increases yield up to 20% apart from improving drought tolerance</p> <p>Rate /kg; Rs. 200/ kg+5% GST ; Total: Rs. 210/kg</p> |

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| | | <p>Terms of supply and payment (Bank details) Supply can be effected after the receipt of total cost. The DD / Cheque should be drawn in the name of <u>The Professor and Head, Dept. of Crop Physiology, TNAU, Coimbatore</u> and the same has to be sent to the above address. Otherwise, the total amount may be transferred to the A/C No. 10663187933 (Account Name: Professor and Head, Dept. of Crop Physiology, TNAU, Coimbatore 3; IFSC Code: SBIN002274) and the payment details through online has to be intimated to this office for further action</p> <p>Approximate date of supply: It can be supplied within a week after the receipt of supply order and product cost. Minimum order quantity : 4.0 kg</p> <p>TANSEDA</p> <p>It is programmed to test the performance of Groundnut Rich Booster at SSF- Musaravakkam (Kanchipuram), Bhavanisagar (Erode), Vellalarviduthi (Pudukottai), Neyveli (Cuddalore) and Vinayagapuram (Madurai) on pilot basis in an area one ha each during Rabi 2019-20. Indent has been placed with TNAU for 50 kgs.</p> |
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| 59 | Eco-friendly method of driving away wild boar menace is to be evolved at farm level | The information provided from the Directorate of Agri Business, TNAU, Coimbatore on "Herboliv-Wild Animal Repellent" for eco-friendly method of driving away wild boar menace at farm level. |
| 60 | It is requested to send the planting material availability and to provide the planting materials required for 0.25 acres to DDH, Kodaikanal and seed materials required for 1.00 acre to JDH Ooty for propagation. [TANHODA, Chepauk, Chennai] | The available seed material of Garlic variety Ooty – 2 has been spared to State Horticultural Farm, Nanjanad, Ooty (20 kgs) and to State Horticultural Farm, Kodaikanal (10 kgs). [HRS, Ooty] |
| 61 | The portray filling pneumatic seed picking and sowing machine developed by TNAU may be engaged in SHFs for achieving efficiency [Dept. of Horticulture and Plantation Crops, Chepauk, Chennai] | Price details received from TNAU on 01.11.2019. Intend placed to purchase pneumatic seed picking and sowing machine developed by TNAU for the State Horticulture Farm (SHF), Thimmapuram. |
| 62 | TNAU has been required to carry out MLTs and FLDs of the newly developed varieties / hybrids in Government farms to facilitate the department officials to assess the performance. Proper assessment and recording of observations need to be done by the officials concerned in this regard to provide scope for maximum improvement before they are released as varieties to make them amendable for ready adoption by farmers | <ul style="list-style-type: none"> • As per request 10 cents of land have been allocated to TNAU at Centre of Excellence for cut flowers, Thally, Krishnagiri District to carryout MLT for Capsicum. Performance will be recorded and given to TNAU for release of varieties. • Place to carry out MLT for various crop varieties will be allocated to TNAU as per requirement. |

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| 63 | <p>Progressive farmers should be taken on Exposure visits under ATMA to MLTs and FLDs laid out in nearby TNAU farms/Research stations or KVK's and allowed to assess the performance of the varieties in questions. Their feedback will be of much importance which needs to be recorded and furnished to the breeder concerned through the DHPC.</p> | <p>MLTs and FLDs trails details communicated to district officers. It will be explored to progressive farmers during their training under ATMA, NADP, IHDS and NHM. Performance of varieties will be documented.</p> |
| 64 | <p>Since Adaptive Research Trails (ARTs) decide the performance of the variety in the farmers environment, utmost importance should be attached for the same to assess and record the actual performance of the variety. This will help in avoiding complaints about the released variety at a later date. The ARTs laid should be subject to surprise visits by the ADH (PM) at the district level and recording of observations should be done in a professional way. This should be reviewed in the monthly meeting held by the JDHs/DDH and the DHPC.</p> | <p>Adaptive Research Trails (ARTs) communicated to district officers. ADH (PM) of concerned districts were instructed to make surprise visit and documentation.</p> |

| APC's Suggestions during the visit to Exhibition in TNAU on 24.10.2019 | | |
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| No | Recommendations | Action Taken |
| 65 | The rice variety VGD1 which is fine grain and medium duration needs to be included in seed chain of State Seed Farm by getting the breeder seed from TNAU and multiplication to be started. (Action : DOA / CPBG) | <ul style="list-style-type: none"> The nucleus seeds of VGD 1 are maintained at Agricultural Research Station, Vaigai Dam for further seed chain programme. Indent has been received for the supply of 200 kg of Breeder Seeds |
| 66 | The rice variety CO43 Sub 1 to be explored in rice growing area and the JDAs should initiate for popularization. (Action : DOA / CPBG) | Based on the indent received from the indentors the Breeder Seed will be produced and supplied. |
| 67 | Maize hybrid COH M6 and COH M8 to be multiplied through SSF and seed farmers by getting A line and R line from TNAU. The JDAs of Maize growing districts have to popularise these hybrids. (Action : DOA / CPBG) | <ul style="list-style-type: none"> The parental lines of COHM 6 and COHM 8 are maintained at department of Millets, TNAU, Coimbatore for further seed chain programme. |
| 68 | Sunflower hybrid COH3 of TNAU has to be popularised in alternate cropping pattern area. The seed production of this hybrid to be taken up in 10 SSF where ever possible. (Action : DOA / CPBG) | <ul style="list-style-type: none"> The parental lines of COH 3 are maintained at department of Oilseeds, TNAU, Coimbatore for further seed chain programme. Communication was made to the Director of Agriculture, Chepauk, Chennai by the Director, CPBG, TNAU, Coimbatore regarding the availability of hybrid seed (Ref. No.DCPBG/Oilseeds/High Yielding Sunflower hybrid/2019 dt.27.08.2019) Hybrid seeds of 100 kg sunflower COH 3 was supplied to the AEC, Department of Agriculture (Trichy (25kg), Karur(25kg), Thoothukudi (25kg) and Virudhunagar (25kg)) in November 2019 |

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| 69 | All JDAs to popularise YRCH2 castor variety released from Yethapur in dry area and waste land as an alternate crop. (Action : DOA / CPBG) | <ul style="list-style-type: none"> The Parental lines are maintained at TCRS, Yethapur for further seed chain programme. |
| 70 | Green gram CO8 with uniform maturing variety to be popularised in Delta region and pulse growing regions of Tamil Nadu. (Action : DOA / Dir. School of Genetics) | <ul style="list-style-type: none"> Green gram CO8 is more suitable for Kharif and Rabi seasons of Northern, North Western, Western and Southern Zones of Tamil Nadu. |
| 71 | The STCR – IPNS (Soil test crop response based balanced fertilization through Integrated Plant Nutrition System) is to be followed in all districts (Action: JDAs, DDH.) | STCR -IPNS based fertilizer prescription has been developed for agricultural crops (13), horticultural crops (13) and cropping systems (9) and the details have already been communicated to JDAs and DDHs (Details enclosed in Annexure 13). |
| 72 | The physiologically active formulations of TNAU maize maxim, groundnut rich and sugarcane booster to be adopted by all JDs in irrigated cropping area. TNAU – KVKs, Maize Stations, Sugarcane Stations and Oil Seed Stations has to do demonstrations and make the farmers to see by hands on experience. (Action : DCM) | All crop boosters are being supplied on-intend basis and the efforts can be further strengthened by conducting large scale demonstrations in KVKs and Research Stations. |
| 73 | The Banana H.212 a Ney poovan (Bangalore Rasthali) of TNAU in pipe line needs to be introduced in SHF for multiplication. (Action : DHPC / Dean Hort) | Variety release proposal has been submitted through SVRC on 05.11.2019. It is a pre release culture with nematode resistance and similar to Ney Poovan |

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| 74 | The Papaya CO8 a Dioecious variety red colour pulp to be incorporated in the area expansion schemes. (Action : DHPC / Dean Hort) | The variety is popularized among farmers. Seed production is carried out and supplied to the needy farmers |
| 75 | Brinjal grafted plants available in TNAU, Coimbatore are to be popularised in the places where ever soil borne diseases are predominant. All the DDH are to allocate some area of brinjal crop with grafted plants. (Action : DHPC / Dean Hort) | 25,000 number of grafted brinjal plants are supplied to the farmers through the Horticulture Department officials to popularize the technology |
| 76 | Jasmine export technology developed are to be made available to the farmers of Jasmine growing districts viz., Coimbatore, Erode, Madurai, Dindigul, Thiruvallur, Kanyakumari and wherever there is predominance of Commercial flower growing. (Action : CAM & AB / DHPC / Dean Hort) | In collaboration with private jasmine export entrepreneurs, the technology is being effectively utilized to increase export to other countries |
| 77 | Jasmine nitidum CO1 of TNAU to be planted in flower growing districts at least in minimum area. This will shall buffer the demand during the lean season. (Action : DHPC / Dean Hort) | The variety is suitable for year round production To popularize the variety, large scale demonstration trials conducted in farmer's field at Panamarathupatty, Salem Dist. Based on the demand, the planting materials will be supplied to the farmers |
| 78 | Microtuber technology in glorililly – gloriosa to be popularised in Salem, Dharapuram area where the gloriosa is popularly grown. (Action : DHPC / Dean Hort) | This is a viable technology and the technology will reduce the planting material cost. Technology release proposal has been submitted for release during 2020 |
| 79 | Management practices of Guava nematode to be popularised by field officials of Horticulture for timely control. (Action : DHPC / Dean Hort) | A field guide for the diagnosis of nematode management of horticultural crops has been published and 50 copies will be given to DHPC for dissemination and effective management. |