

QUERIES AND ANSWERS

PADDY

Suitable measures for black bug management may be recommended (Thanjavur)

Insect pest dynamics in Tamil Nadu is being monitored through pest surveillance programme in operation at the Centre for Plant Protection Studies. As far as rice is concerned, the black bug did not attain the status of pest though the sporadic occurrence was reported. The insect could be monitored through light traps which also serve as mass trapping device. The systemic insecticides dimethoate/methyl demeton-500 ml/ha which are used to manage the other serious pests will take care of the black bugs also.

Research needs to be initiated for the biological control of weeds such as Cyprus, Hurriali etc. in paddy field (Ramanathapuram)

Weed control using insects as biological agents under rice ecosystem is not explored even at global level as viable technology due to the taxonomical relationship of the crop and weed and the insects feeding on them.

High yielding short duration paddy varieties with resistance to blast, brown planthopper and stemborer suitable for Samba and Thaladi seasons may be suggested (Dindigul)

Recently released CO51 paddy variety having the resistance to blast can be tried.

New variety alternate for ASD 16 may be evolved (Erode)

Rice TPS 5 has been recently released as an alternative to ASD 16. The new rice culture CB 14508 (ADT 37/CB 05501) with similar attributes of ASD 16 is being evaluated under multi-location trials.

ADT 49 variety cultivated in Navarai Season facing panicle initiation problem. Suitability of ADT 49 paddy for Navarai season may be suggested (Pudukottai)

The rice variety ADT (R) 49 is recommended only for Thaladi season not for navarai season.

Reason for red rice in CR 1009 paddy variety may be given (Pudukottai)

If the genetic purity is maintained from breeder seed to certified seed is maintained the

problem of red rice will not arise.

Paddy variety (like BPT 5204) with medium duration and good cooking quality samba variety may be suggested to satisfy the preference of the farmers (Karur)

The recently released TKM 13 is gaining popularity to replace BPT 5204.

A short duration samba variety in paddy for Aravakuruchi and Paramathy (Nearly 1000 hectares) blocks (since only 3 months water is available from Amaravathy river) in Karur District is needed (Karur)

CO 51 is performing well as a short duration variety in the districts viz. Dharapuram and Tiruppur and the same can be tried.

Alternative medium duration (120-130 days) variety resistant to stem borer with high tillering and short bold grain type to replace the existing variety TPS 3 may be evolved (Kanyakumari)

The new rice culture TP 09156 with 138 days duration from Agricultural Research Station, Thurpathisaram with 138 days duration is under the evaluation in MLT.

Nearly 4500 hectares of areas are being covered under IR 20 variety. Even though several medium duration varieties have been evolved so far, IR 20 variety is still the ruling variety in Mettur canal system area (East Bank canal in Pallipalayam block) of this district. Since it is high yielding and suitable for samba season of this particular paddy area and its performance in productivity research may be taken up for improvement of IR 20 and released as "Improved IR 20" just like the release of "Improved white Ponni" – (Namakkal and Thiruppur)

The alternative rice varieties for IR 20 are ADT (R) 46 and CO (R) 50. The question of improving IR 20 for its productivity will be taken positively.

In Kolli hills block, (hilly tract 1200 MSL) of Namakkal District, during early Samba season farmers are growing paddy variety "Wyanad 2" with longer duration (> five months) is having lower yield potential. Wyanad 2 is non-lodging, less tillering with bold red grains and consumed by the tribal people of this tract. A suitable replacement may be made for Wyanad II (Namakkal)

Research attempts will be made for the improvement of Wyanad 2 for its yield potential.

Alternate paddy variety for ADT 45 to suit the Navarai season of Perambalur District may be identified (Perambalur)

The short duration variety CO 51 is recommended as an alternative to ADT (R) 45

Blast resistant varieties with similar characters of ASD 16 and BPT 5204 need to be evolved (Thoothukudi)

The rice cultures CB 14508 with short duration is identified as a replacement for ASD 16 which is under MLT. Rice variety TKM 13 with 130 days and CB 09123 with 135 days duration is recommended in place of BPT 5204.

Varieties equivalent to private hybrid (Goraknath 509) with marketable preference may be evolved (Theni)

TKM 13 variety is recommended which has high market preference

Rice varieties with resistance to leaffolder, BPH, blast and BLB are needed for Kuruvai (Theni)

The short duration variety CO 51 and medium duration culture CB 09123 with resistance to various biotic stresses are recommended.

Varieties with multiple resistance to biotic stresses and wide range of adaptability *i.e.* to replace the long standing ADT 43, BPT 5204 and CR 1009 are needed (Thanjavur Sivaganga)

The variety CO 51 to replace ADT 43 and varieties TKM 13 and CB 90123 to replace BPT 5204 and CR 1009 *Sub1* to replace CR 1009 are recommended.

Developing the hybrids with acceptable grain quality, duration, and disease/pest tolerance (Thanjavur)

Rice hybrid CORH 3 and CORH 4 with good grain quality and disease/pest tolerance are recommended. A new donor LF 293 is identified as first time in the country.

Strategies should be developed for evolving varieties with resistance to leaf folder and BPH should be made (Thanjavur)

The variety CO 51 and pre release culture CB 09123 are found to possess resistance to BPH.

Paddy variety TKM 13 suits well to Ramanathapuram block in Ramanathapuram District and performed well during 2015-16 in Samba season by using the truthfully labeled seeds. This variety may kindly be notified and 200 kg of TKM-13 Breeder seeds may kindly be supplied to Ramanathapuram District (Ramanathapuram)

The notification of this variety is pending with Government of India. However sufficient seeds are available at Rice Research Station, Tirur for distribution.

Alternative rice varieties to ASD 16, ADT 43 and ADT 45 may be recommended (Madurai and Thiruvapur)

CO 51 was released as an alternative to ADT 43 and ADT 45 rice varieties. TPS 5 has been released for the replacement to ASD 16.

In Tirunelveli District for the past two years superfine paddy variety like JGL 1798 is getting 25 percent increased market price than other varieties but susceptible to blast. Therefore a blast resistant superfine medium duration paddy variety may be evolved to cater the need of Tirunelveli District farmers (Tirunelveli)

The variety TKM 13 and the pre release culture CB 09123 are suitable replacements.

In Tirunelveli District, farmers are slowly shifting from bold to super fine varieties since super fine varieties fetch higher price in the market. The private varieties like Komal, Atchaya, Komal King, Amman ponna, are being cultivated in larger area in Tirunelveli District. Hence suitable super fine varieties to replace these private varieties may be evolved (Tirunelveli)

Rice varieties from other states/private companies may not be recommended since they are not extensively tested in Tamil Nadu and are not recommended by TNAU. The released variety TKM 13 with superior grain quality can be recommended. A pre-release culture CB 09123 is found to have the superior grain quality.

Paddy ASD 16 is being cultivated in larger area irrespective of seasons in Tirunelveli District. During Pishanam 2004-05 blast incidence was noticed and during 2006-07, 2007-08 and 2008-09 severe blast incidence was observed in the fields of ASD 16. Suitable short duration blast and tungro resistant short bold paddy variety to substitute ASD 16 may be evolved to overcome the specific problem of Tirunelveli District (Tirunelveli)

TPS 5 was released as the replacement to ASD 16. The new culture CB 14508 with bold rice is under MLT.

During 2010-2011, 2011-2012 both in Kar and Pishanam seasons of Tirunelveli District the Paddy Crop was severely affected by Stem borer. The remedial measures taken to manage the pest had less effect. Therefore a suitable stem borer resistant paddy variety with high yield potential may be evolved (Tirunelveli)

So far no resistance source for stem borer is identified. However ADT (R) 46 medium duration variety is found to possess field tolerance to stem borer.

Evolving saline resistant variety for bore well area with salinity in Tiruvarur District (Thiruvarur)

The rice culture TR 05031, TR 09030 and improved white ponni *saltol* are under ART.

Drought tolerant and less water requiring varieties shall be suggested (Sivaganga)

The rice cultures CB 068031, TM 09135, CB 08 702 were evaluated under ART and found promising.

Less than 10 year old short duration varieties suitable for Sornavari, Samba, Navarai Seasons shall be provided which shall be above or on par with the following ruling varieties viz. ADT 37, ADT 43, ADT 39, ADT 45 (Vellore)

The rice variety CO 51 is recommended for replacement to all these varieties in sornavari and navarai seasons.

Varieties equivalent to improved white ponni shall be evolved (Vellore)

The culture CB (MAS) 14065 is evolved as an equivalent to Improved white ponni and being tested under ART in the ensuing season.

Lesser duration varieties with fine grain quality shall be suggested (Vellore)

The culture CB 12588 and TM 10085 with short duration were found with fine grain and being tested in ART 2016.

Saline tolerant paddy variety suitable for this district may be suggested (Vellore)

The variety TRY 3 and the cultures TR 05031, TR 09030 and Improved white ponni (*Saltol*) have been developed for salinity tolerance.

Farmers need a suitable “Scented Paddy variety “for Samba (July- September) sowing season with high yield potential (Vellore)

The cultures CB (MAS) 14142 and VG 09006 were evolved as scented paddy varieties and being tested under ART.

Direct seeding of rice is practiced to some extent in Dharapuram block. Suitable varieties and technologies for direct seeding of rice is required (Thiruppur)

The variety CO 51 is recommended for direct seeding.

Local Paddy variety is cultivated in more than 500 ha of hill tracts of Yercaud block. Therefore, a medium duration high yielding Paddy variety that can come up well in rainfed hilly tracts may be evolved to improve the productivity and production of Salem District farmers (Salem)

The medium duration variety CO (R) 50 is recommended to replace the local variety to improve production and productivity.

While raising seed farm paddy CO 51, variety fails in Other Distinguishable Variety (ODV) . So alternate variety is requested (Nagapattinam)

Rejection of seed lot due to ODV is not a problem associated with variety. Proper care and maintenance in genetic purity in the field and during processing can only avoid ODV in any rice varieties.

Normally in Vennar region paddy samba crop is mostly affected by drought. So suggest drought tolerance high yielding variety for *samba* season (Nagapattinam)

The rice culture CB (MAS) 14065 developed through biotechnological approaches suitable for samba season is under testing.

Normally In Nagapattinam District Paddy samba crop is affected by flood and high rainfall in North East Monsoon. so suggest suitable variety for water submerge condition for samba season (Nagapattinam)

The variety CR 1009 *Sub1* was released for such water submerged condition for samba season which has genes for drought tolerance.

Suitable alkaline salt tolerant paddy varieties are to be developed to replace TRY 1 and TRY 3 (Nagapattinam and Ariyalur)

The rice cultures, TR 05031, TR 09030 and Improved white ponni (*Saltol*) are being tested in ART in salt affected districts.

Suitable variety to be evolved for waterlogged condition (Nagapattinam and Ariyalur)

CR 1009 *Sub1* is recommended for water lodged condition.

CR 10009 fetch low price in open market because of red rice problem still persist so Suitable technology may correct this problem (Nagapattinam and Ariyalur)

Red rice in CR1009 is not an inherent genetic problem. Instead of CR 1009, CR 1009 *Sub1* may be cultivated.

The continuous cultivation of paddy crops in Tiruvannamalai we noticed that the short duration varieties like ADT 43, ADT (R) 45 and ADT 37 increased the vulnerability of brown planthopper incidence. Improved varieties with resistance to brown plant hopper to be evolved (Thiruvannmalai)

The rice variety CO 51 and TPS 5 is recommended for such situation.

The ruling samba variety BPT 5204 highly susceptible to pest and diseases and yield are slowly declining. Alternative variety to BPT 5204 need to be developed (Trichy)

The rice variety TKM 13 and culture CB 09123 are recommended for samba season with fine grain type.

The local traditional "Seeragasamba" has to be improved by the methods like pure line selection and a suitable alternate variety with same varietal characters as that of Seeragasamba with high yield potential may be evolved (Trichy)

The rice culture VG 09006 is identified as an alternative for seeragasamba and tested under ART.

Fine grain variety suitable for saline and alkali soil need to be developed (Trichy)

The rice cultures TR 05031, TR 09030 and Improved white ponni (*Saltol*) were evolved for saline tract and tested under ART.

Short and medium duration paddy varieties with good pest and disease resistance tolerance are facing lodging problem during harvest stage even for a slight rainfall (e.g. CO 51). Farmers expect a non-lodging variety as an improvement character in these variety (Kanchipuram)

Efforts are intensified to overcome the lodging problem in CO 51.

In paddy, farmers want a variety with a similar characters like white ponni, with lesser duration (Kanchipuram)

The rice culture CB 14142 is tested under ART this year. Excess Nitrogen application leads to lodging in any rice variety and rains during maturity stage.

In paddy farmers expect a variety with excellent cooking and keeping quality (Kanchipuram)

The rice variety TKM 13 and CB 09123 were evolved with good cooking qualities. Apart from this, the rice cultures AD 09219, CB 10553 and AD (Bio) 09518 with short duration and AD 09493 and CB 11107 with medium duration were identified with good cooking and keeping qualities and evaluated under ART.

ADT 49 variety cultivated in Navarai Season facing panicle initiation problem. Suitability of ADT 49 Paddy for Navarai season may be suggested – Pudukottai

This variety is recommended for Late Samba and Thaladi seasons only and it is not suitable for Navarai season.

Reason for Red rice in CR 1009 Paddy variety may be given – Pudukottai

CR 1009 Sub -1 has been released which is free from red rice besides tolerance to submergence.

Technology needed to manage the tail end drought – Thoothukudi

The adverse effects of water stress on crop growth can be mitigated by the application of chemicals such as nutrients, anti-transpirants and Plant Growth Regulators (PGRs), which induce the plants to become adaptive to water stress situations for a specified period and the water requirement for such periods can be minimized or saved. Foliar spraying of PPFM @500 ml/ha, Foliar spraying of 2% DAP and 1% Muriate of Potash would save the crop for the period from 1 week to 10 days from drought.

Varieties developed for multiple resistance and wide range of adaptability ie. Varieties which can replace ADT-43 , BPT -5204 AND CR-1009 Which are long standing varieties and having wide range of adaptability - Thanjavur

Already CO51 came into existence in the place of ADT 43, besides a new culture viz., AD07073 which is under OFT .

Standardisation of agronomic practices for different type of transplanter – Villupuram
Standardisation of raising tray nursery and method of planting to reduce the number of seedlings per Hill – Villupuram

The medium for tray nursery such as 70 % soil + 20 % well decomposed FYM + 10 % rice hull + DAP @ 2 g/ kg of soil + Vermicompost @100 g/tray + Azospirillum 2 g/kg (soil application) + Azosphos 4 g /kg of soil (soil application) with seed rate - 10 kg/ha would be reduced number of seedlings per hill (6 Nos.)

Suitable technology to overcome terminal drought in Paddy – Sivaganga

Foliar spraying of PPFM @500 ml/ha, Foiliar spraying of 2% DAP and 1% Muriate of Potash would save the crop for the period from 1 week to 10 days from drought.

Technology to be evolved for growing paddy under unpaddled condition - Vellore

Technology is under study for its adaptability, energy saving and water requirement.

Weeds are one of the major problems in rice cultivation. Weed management technology without affecting soil health is required – Thiruppur

The dose and timely application recommended herbicides in rice would not affect the soil health.

Direct seeding of rice is practiced to some extent in Dharapuram block. Suitable varieties and technologies for direct seeding of rice is required – Thiruppur

The varieties such as ADT 36, ASD 16, ASD 18, MDU 5, IR 50, ADT 43, CO 47, ADT (R) 45, ADT (R) 47, CORH 3 are suitable for direct seeded rice and already package of practices for different system of direct seeded rice are available in CPG 2015.

Row spacing is more in machine transplated rice. Crop is not fully covered in initial stage. Power weeder is not effectively use to control all weeds in the field. so effective weed control technology is needed in machine transplanted rice – Nagapattinam

Cono weeding is recommended for weed management for transplanted rice. Besides, herbicided of both pre emergence and post emergence are avaulable for the effective weed control.

Suitable Integrated Weed Management to be developed because Weedicide could not be applied in direct sown paddy – Ariyalur

In direct seeded rice, simultaneous germination of weed and paddy seeds occur. Under this condition, without application of pre emergence herbicide , it is possible to arrest the weed menace. IWM practices as follows : Apply pendimethalin 1.0kg/ha on 5 days after sowing or Pretilachlor + safener (Sofit) 0.45kg/ha on the day of receipt of soaking rain followed by one hand weeding on 30 to 35 days after sowing or first weeding can be done between 15 and 21 days after germination and Second weeding may be done 30 - 45 days after first weeding.

Uniform no. of seedlings per hill and uniform plant to plant spacing is needed – Trichy

The existing machine transplanters are having the provisions for picking of seedlings as well as maintain the plant to plant spacing uniformly.

Location specific soil Management measures for multinutrient deficiencies in paddy cultivation may be suggested - Kanyakumari

Adopt soil test based fertilizer recommendations to overcome the major nutrient deficiencies. Apply TNAU Micronutrient mixture @ 25 kg/ha as enriched FYM (prepare enriched FYM at 1: 10 ratio of MN mixture and FYM ; mix at friable moisture and incubate for one month in shade) to overcome the micronutrient deficiencies.

Paddy Nutrient Management practices for late planting as there is lodging problem in Co-51 during late kuruvai planting – Madurai

Planting of aged seedlings(30-35 days old) @ 2-3 seedlings
Apply 25% extra nitrogen basally and skip the last split of nitrogen.

Technologies for reduction of salinity in borewell water-Technology to reduce Salinity of borewell water during Summer and Kuruvai – Thiruvarur

Reducing the salinity of borewell water is not possible. However, the salinity water can be managed by suitable crop, cultural and fertilizer practices.

Plant species	Threshold salinity (dS m ⁻¹)
Field crops	
Cotton	7.7
Sugarbeet	7.0
Sorghum	6.8
Wheat	6.0

Soybean	5.0
Groundnut	3.2
Rice	3.0
Maize	1.7
Sugarcane	1.7
Vegetables	
Tomato	2.5
Cabbage	1.8
Potato	1.7
Onion	1.2
Carrot	1.0
Fruits	
Citrus	1.7

Studies should be initiated on zinc solubilizing microorganisms and Zinc use efficiency for rice, since almost the entire region of CDZ is deficient in available zinc

The work on zinc solubilizing bacteria and its efficacy has already been investigated. Five Zn solubilizing bacteria [*Achromobacter xylosoxidans* (ZSB6); *Enterobacter cloacae* (ZSB12 and ZSB14); *Pseudomonas chlororaphis* (ZSB15); *Bacillus* sp. (TNAU-11)] capable of solubilizing insoluble Zn sources viz., zinc oxide, carbonate and phosphate were identified from rice rhizosphere. All these strains can increase the soil available Zn up to 10 mg/Kg in the presence of Zn amendments. These ZSB strains performed well in wetland, red lateritic and calcareous soils in enhancing the Zn availability. Inoculation with zinc phosphate ensures the soil available Zn (6-8 mg /Kg of soil) throughout the rice cropping period and enhanced the Zn uptake and grain yield. ZSB inoculations also increased the grain Zn content and reduced the phytic acid/Zn molar ratio of rice. These strains are now under multi-location trial and will be available as bioinoculants in the forthcoming year.

New formulations of Chelated Copper may be evaluated for Green algae management

Application of copper sulphate @ 5 Kg/ha as soil application / soil drenching is effective for controlling green algae in rice.

Combination of management practices and chemical methods viz., alternate wetting and drying; delayed phosphatic fertilizer application (15-30 days after transplanting) and copper sulphate at 5 Kg/ha may be followed as an Integrated green algal control measure.

Chelated copper in the form of gluconates and EDTA will be evaluated for green-algal control under laboratory and field conditions.

MILLETS

Suitable technology needed for bird menace (Coimbatore)

In view of the Wild Life Acts, birds could be scarred using mechanical sounds and erecting light reflective ribbons across the fields.

Suitable and economical varieties may be evolved. (Improved CO 1) (Coimbatore)

A high yielding dual purpose sorghum variety CO 30 with grain yield potential of 2500 kg/ha under rainfed and 3300 kg/ha under irrigated condition is available with fodder yield potential of 9 t/ha.

Dual purpose (grain and fodder) high yielding variety of Sorghum may be suggested for Dindigul District (Dindugal)

A high yielding dual purpose sorghum variety CO 30 with grain yield potential of 2500 kg/ha under rainfed and 3300 kg/ha under irrigated condition is available with fodder yield potential of 9 t/ha.

Development of red grain dual purpose variety alternate to local Thalaivirichan open earhead type (Dharmapuri)

High yielding red grain sorghum variety Paiyur 2 was released to meet the demand of Dharmapuri farmers. Besides a high yielding dual purpose red grain sorghum culture TNS 660 has been developed and is under MLT.

In Namakkal District, Cholan is being cultivated in about 70,000 Ha. both in irrigated and rainfed condition. Co 4 Cholan variety is highly preferred by farmers both in Rainfed and Irrigated seasons due to its palatability, Red colour grains, shorter duration (95 days) and compact earhead. This variety is fodder cum grain variety. Red seeded variety suitable to this tract may be evolved (Namakkal)

Red grain sorghum variety Paiyur 2 has been released from RRS, Paiyur. It is a short duration and dual purpose variety. Besides a high yielding dual purpose red grain sorghum culture TNS 660 has been developed and is under Multi location trial.

In Tirunelveli District rainfed Cholan is being cultivated in about 3000 Ha. in Sankarankoil, Tenkasi and Shencottai taluks. In Tirunelveli, farmers prefer sorghum variety with white and small sized grains as that of K tall. It is a very old variety. Hence a short duration cholam variety may be evolved for September - October sowing in black soils of Shencottai taluk to replace K Tall (Tirunelveli)

A dual purpose high yielding sorghum variety K12 has been released during the year 2014, which is suitable for southern districts under rainfed and irrigated situation. It is white grain variety with medium size grain.

An improved variety which is less than 10 years old may be suggested and sufficient breeder seed may be supplied to replace existing varieties during Kharif season (Vellore)

The sorghum variety Co 30 is less than 10 years old and released during the year 2011.

Dual purpose short duration sorghum varieties with good grain and fodder yield for both rainfed and irrigated conditions (Tiruppur)

Sorghum: A high yielding dual purpose sorghum short duration (100 days) variety, CO 30 with grain yield potential of 2500 kg/ha under rainfed and 3300 kg under irrigated condition is available. with fodder yield potential of 9 t/ha

Pest and Disease resistant short duration sorghum hybrids are is required (Tiruppur)

Sorghum hybrid CO 5 which is moderately resistant to shoot fly is available.

Suitable Hybrid sorghum is required (Tiruppur)

Sorghum hybrid CO 5 which is moderately resistant to shoot fly is available

Sorghum is cultivated in 30,000 ha every year both for fodder and grain. Red Cholan variety CO 4 is widely cultivated in most part of the district. A short duration and drought resistant high yielding sorghum variety/hybrid may be evolved to meet the requirement of the district to increase the productivity and production of food grains (Salem)

Red grain sorghum variety Paiyur 2 has been released from RRS, Paiyur. It is a short duration and dual purpose variety. This variety may be promoted. Besides a high yielding dual purpose red grain sorghum culture TNS 660 was developed from Dept. of Millets and is being tested under Multi location trial.

Integrated packages needed for the control of root grub in maize crop in rabi seasons (Dindigul and Perambalur)

- Large scale mechanical collection of beetles that congregate on neem leaves on the night of emergence immediately after first showers during May-June reduces beetles population progressively over a few years.
- 2. Application of chlorpyrifos 20EC @2ml/litre of water on small neem trees

immediately after the first summer rain to kill the adult beetles that congregate on these trees the following day. Attracting the adults to big branches of the neem trees sprayed with insecticides by placing in the fields

- Spot application of phorate 10G @ 200 gms/cent (20 kg/acre) mixed with 1 kg of sand in the affected area and also surrounding area with healthy plants and irrigating immediately for dissolving the granules and repeating the application after 20 days for better control. Spot drenching of chlorpyrifos 20 EC @ 2 ml/litre in the affected clumps and also nearby surrounding healthy clumps @ 5 litres of insecticide solution per clump under severe incidence.

Studies may be conducted on uncontrolled weeds, insects and diseases management (Thanjavur)

Insect and other arthropod pests infesting maize is being monitored through pest surveillance programme. Integrated pest management for sucking pests, shoot fly, stem borer, white grubs and cob borer developed by TNAU are effective in checking the pest population.

Varieties suitable for grain, fodder & poultry feed is needed (Coimbatore)

In maize single cross hybrids are popular and available. Among the public bred hybrids COH(M) 6, COH(M) 8 are suitable for grain and poultry feed

Ratoon maize with higher yield potential may be developed (Coimbatore)

Normally ratoon is not practiced in maize.

Maize Hybrids tolerant to temperature stress suitable for summer season may be suggested (Dindugal)

In summer season under high temperatures pollen viability is low. However, COH (M) 6 and COH (M) 8 are suitable for all seasons.

New alternate high yielding hybrid variety which could replace private hybrids may be evolved (Erode)

Single cross maize hybrids COH(M)6 and COH(M)8 are high yielding and are found superior than the private bred hybrids by more than 10 per cent at both state and national level

As poultry industry is predominant in this district; farmers are cultivating maize in larger area as poultry feed. They are growing private maize hybrids only. Our COHM 5 and COHM 6 are not competent with other private hybrids in terms of yield. As

private hybrid seed cost is higher, Farmers are expecting low cost hybrid seed with higher yield potential than private hybrids. So, high yielding and potential maize hybrids suited to this district may be evolved (Namakkal)

Single cross maize hybrid COH(M) 6 and COH(M)8 are high yielding and found superior than private bred hybrids by more than 10 per cent in state as well as national level. Already COH (M) 6 is popular at national level for its yield potential. Gujarat State Seed Corporation is producing COH(M) 6 in large quantities for supply throughout the nation as there is a huge demand for this hybrid among the farmers. In addition SSF, Pongalur is also producing seeds of COH(M)6 and during last year more than 10 tonnes of seeds were produced and supplied. It is popular among the farmers not only in this state but also in other states.

Karnataka State Seed Corporation did trials in farmers field with COH(M) 8 and found to perform well in the state of Karnataka and an MoU has already signed between TNAU and KSSC in this regard. Both hybrids are well suited for nammakkal districts.

Drought resistant Variety and alternate for private hybrid Maize Seeds (Perambalur)

Single cross maize hybrid COH (M) 6 is suited for both irrigated and rainfed situations and is recommended for water limiting situations.

Non availability of site specific high yielding new varieties and hybrids with reasonable costs. Hybrids and varieties should be developed and made available to farmers at affordable cost (Thanjavur)

Single cross maize hybrid COH(M) 6 and COH(M)8 are high yielding than the private bred hybrids and were found to out yield the private bred hybrids by more than 10 per cent in state as well as national level. Already COH (M) 6 is popular at national level for its yield potential and it is the national check for all India trials. Costs of these hybrids are less compared to private hybrids.

Hybrids competent enough with the private ones shall be suggested (Vellore)

Single cross maize hybrid COH(M) 6 and COH(M)8 are high yielding than the private bred hybrids and were found to out yield the private bred hybrids by more than 10 per cent in state as well as national level. Already COH(M)6 is popular at national level for its yield potential and it is the national check for all India trials. Hybrid COH(M)6 was released during 2012 for Tamil Nadu and COH(M)8 during 2013 at national level including Tamil Nadu state.

High Yielding maize hybrids suitable for cultivation in all seasons is required (Tiruppur)

COH(M) 6 and COH(M)8 are suitable for all seasons.

Since most of the area in Tiruppur District is under rainfed cultivation maize hybrids and varieties suitable for rainfed cultivation is required (Tiruppur)

Single cross maize hybrid COH (M) 6 is suitable for both irrigated and rainfed situations and is recommended for water limiting situations.

Evolving new drought tolerant, high yielding variety suitable for *Kharif* season (Dharmapuri)

Samai variety CO 4 is a high yielding, drought tolerant variety and is suitable for *kharif* season.

Stemborer resistant maize hybrids are required since the economic loss caused by stem borer is high (Tiruppur)

Single cross maize hybrid COH(M) 6 is suitable for both irrigated and rainfed situations and is moderately resistant to stem borer.

Suitable Non lodging type of hybrids to be developed (Ariyalur)

Single cross maize hybrid COH (M) 6 and COH (M) 8 are suitable for both irrigated and rainfed situations.

An improved cumbu variety which is less than 10 years old may be suggested and sufficient breeder seed may be supplied to replace existing ruling varieties during *Kharif* season (Vellore)

High yielding, short duration cumbu hybrid CO 9, released during 2011 and the composite (Variety) CO 10 released during 2016 may be popularized in Vellore district. Required quantity of breeder seeds of variety CO 10 and parental seeds of the hybrid CO 9 can be produced, if the indent was placed in advance.

Suitable IPM for shoot fly needed- Thoothukudi

High seed rate in shoot fly prone region to maintain the required plant population, placing fishmeal traps 12 / ha and need based application of dimeathoate / methyl dematon 2 ml/ lit

Varieties on par with private hybrids needed (Thoothukudi)

Sorghum: A high yielding dual purpose sorghum short duration (100 days) variety CO 30 with grain yield potential of 2500 kg/ha under rainfed and 3300 kg/ha under irrigated

condition is available with fodder yield potential of 9 t/ha.

Cumbu : A high yielding, short duration cumbu hybrid CO 9 is available, which gave 15 per cent higher yield than the private hybrids in Tamil Nadu State. This hybrid is resistant to downy mildew and rust diseases.

High yielding cumbu composite (Variety) CO 10 was released during 2016. It is having bold grain and compact ear head.

Both the hybrid/composite is suitable for Thoothukudi district

Maize: Single cross maize hybrids COH(M)6 and COH(M)8 are high yielding than the private bred hybrids and were found to out yield the private bred hybrids by more than 10 per cent in state as well as national level.

Non Availability of varieties equivalent to private hybrid in cumbu & Maize (Theni)

Cumbu: A high yielding, short duration cumbu hybrid CO 9 is available, which gave 15 per cent higher yield than the private hybrids in Tamil Nadu State. This hybrid is resistant to downy mildew and rust diseases. This hybrid may be promoted in Theni district.

Maize : Single cross maize hybrids COH(M)6 and COH(M)8 are high yielding than the private bred hybrids and were found to out yield the private bred hybrids by more than 10 per cent in state as well as national level.

Supply of breeder seed in time such as CO(cu)10 for cumbu (Theni)

Sufficient quantity of breeder seeds of CO 10 cumbu variety can be produced and supplied in time if the indent for the required quantity is placed in advance.

Sugary disease and smut - resistant varieties to be evolved (Theni)

Cumbu hybrid CO 9 and the variety CO 10 are resistant to sugary disease and smut. However, sowing may be adjusted to avoid coincidence of high rainfall at the time of grain filling and maturity stage.

Red sorghum variety with high yielding potential may be developed to replace currently available local chencholam for biscuit making (Madurai)

A promising high yielding short duration red grain sorghum culture TNS 660 has been developed is being tested under MLT during this year.

Evolution of new varieties and supply of breeder seeds by TNAU (Villupuram)

Every year new varieties are being evolved continuously and promising varieties will be released for commercial cultivation in millets.

Sufficient quantity of breeder seeds of all millets are being produced and supplied without any shortfall.

Required quantity can be produced if the indent is placed in advance.

Predominant cropping pattern is Rice-Rice-Pulses. For crop diversification suggest high yielding drought tolerant millet crop suitable for Nagapattinam District (Nagapattinam)

Ragi variety CO 15 is suitable for Nagapattinam district.

A suitable grain cum fodder Sorghum variety for rainfed season as an alternate to the local (Trichy)

A high yielding dual purpose sorghum short duration (100 days) variety CO 30 with grain yield potential of 2500 kg/ha under rainfed and 3300 kg under irrigated condition is available with fodder yield potential of 9 t/ha.

A suitable shoot borer resistant grain sorghum hybrid for rainfed season as an alternate to the local (Trichy)

Sorghum hybrid CO 5 moderately resistant to shoot fly is available.

Increase the availability of breeder seeds of notified Varieties of TNAU for Thenai, Samai and Panivaragu crops (Salem)

Till date all the indented quantity of breeder seeds are produced and supplied to the indenters without any shortfall. Required quantity of breeder seeds can be produced and supplied if indent is placed in advance.

New technology or more income generating tips for escaping from drought in Rainfed Maize cultivation condition - Perambalur

Seed treatment with 2% potassium dihydrogen phosphate
Spraying of maize maxim @ 3kg/acre during tassel initiation and grain filling stage.

There is no proper studies conducted about the requirement of N, P, K, and Zn for maximizing the yields of maize crop .Hence there is a need to identify the response of major, secondary, and micronutrients esp., N, P, K, and Zn required further investigation to establish the nutrient requirement of maize under field conditions – Thanjavur

Recommendation is available in the crop production guide
For varieties:135:62.5:50 NPK kg/ha

For hybrids:250:75:75 NPK kg/ha
Zinc sulphate:37.5 kg/ha

Studies may be conducted on Uncontrolled weeds, insects and diseases management –Thanjavur

Atrazine @ 0.25 kg/ha as pre-emergence on 3-5 DAS + hand weeding on 30-35 DAS.

Studies may be conducted on Response of maize to applied organic manures and integrated nutrient management (INM) – Thanajvur

Recommendation is available in the crop production guide

FYM – 12.5t/ha

For varieties:135:62.5:50 NPK kg/ha

For hybrids:250:75:75 NPK kg/ha

Zinc sulphate:37.5 kg/ha

Weed management in maize at early stages of the crop is difficult. Suitable control measures required – Tiruppur

Atrazine @ 0.25 kg/ha as pre-emergence on 3-5 DAS + hand weeding on 30-35 DAS.
Atrazine @ 0.25 kg/ha as pre-emergence on 3-5 DAS + 2,4-D @ 1 kg/ha on 20-25 DAS,
In line sowing crop - Atrazine @ 0.25 kg/ha 3-5 DAS followed by Twin Wheel hoe weeder weeding on 30-35 DAS.

Proper fertiliser recommendation is needed for WSF – Thoothukudi

Recommendation for WSF is available for maize in the crop production guide (Page No 98 & 99). WSF is not recommended for Cholam and Cumbu

Proper terminal drought management technologies needed – Thoothukudi

Short duration varieties may be selected. Foliar spray of 1% KCl and 3% Kaolin. PPFM @ 1ml/litre can also be sprayed.

Paired row + Drip fertigation - 90x30cm For low fertile soil 60x10 cm spacing yield performance needed – Madurai

Fertigation schedule for irrigated maize hybrid is available in the Crop production guide page number 98-99.

Drought mitigation through seedling transplantation in sorghum, varagu, kudiraivali and cumbu - Virudhunagar

Seed treatment with 2% potassium dihydrogen phosphate for Sorghum and cumbu

Alternate strategy - Biofertilizers application – 2kg potash solubiliser with Azophos application -Recommended by TNAU- FLD study required.

Multi-location trials in rice and maize have already been conducted to evaluate the combined application of Azophos and potassium releasing bacteria (KRB). The results have indicated that combined application of Azophos and KRB could help in reducing the recommended levels of NPK by 25% and increased the yield. Hence, combined application of Azophos and KRB can be followed for millets also.

Ready made kits for Enriched Farm yard manure is requested – Coimbatore

Readymade kits for enriched FYM is not available. But enriched FYM can be prepared by mixing 750 kg of FYM with recommended dose of Phosphorus and incubating for one month. For Zinc, the enriched FYM has to be prepared at the ratio of 1:10.

Micro Nutrient mixture specific to Maize Crop is required – Dindugal

Already TNAU has developed Micro Nutrient mixture specific to Maize and the recommendation is 30 kg/ha TNAU Micronutrient mixture as enriched FYM (prepare enriched FYM at 1: 10 ratio of MN mixture and FYM ; mix at friable moisture and incubate for one month in shade).

There is no proper studies conducted about the requirement of N, P, K, and Zn for maximizing the yields of maize crop .Hence there is a need to identify the response of major, secondary, and micronutrients esp. „N, P, K, and Zn required further investigation to establish the nutrient requirement of maize under field conditions – Thanjavur

Studies have already been conducted in bench mark soils of Tamil Nadu and blanket recommendation of 250:75:75 kg N, P₂O₅ and K₂O ha⁻¹ as given in CPG-2012.

Studies may be conducted on Response of maize to applied organic manures and integrated nutrient management (INM) – Thanjavur

Soil test crop response based integrated plant nutrition system (STCR- IPNS) recommendation may be adopted for prescribing fertilizer doses for specified yield targets and ready reckoners has already been given in the “Crop Production Guide-2012”.

Proper fertiliser recommendation is needed for WSF – Thoothukudi

Fertilizer recommendations given in CPG-2012 based on the research findings are for water soluble fertilizers only. Any WSF can be given as per the fertilizer recommendations given in CPG-2012.

Proper fertiliser recommendation for WSF is needed – Thoothukudi

Foliar spray of 1% urea for yield improvement in black gram.
Foliar spraying of 2%KCl + 100 ppm Boron during dry spell as mid season management practice in black gram during *Rabi* season is recommended to increase the yield.

PULSES

Promotion of Sulphur application in pulses. Sulphur application @20kg/ha (Irrigated), @ 10kg/ha (Rainfed) FLD by KVK required – Madurai

The following basal fertilizer recommendation for increasing the productivity of pulses is already in practice.

Rainfed : 12.5 kg N + 25 kg P₂O₅ + 12.5 kg K₂O +10 kg S/ha

Irrigated : 25 kg N + 50 kg P₂O₅ + 25 kg K₂O + 20 kg S/ha

These recommendations were already tested and confirmed by conducting FLD's in the farmers fields only.

In Tirunelveli district farmers have started using water soluble fertilizers in paddy, pulses and cotton to increase the yield. Hence suitable recommendations for foliar spray of water soluble fertilizers in paddy, pulses and cotton crops may be evolved (Tirunelveli)

Rice

Research work is already in progress at the Dept. of SS&AC for evaluating WSF in rice, Soon after the evaluation work is completed the results will be intimated to the concerned JDA and Dept. of Agriculture.

Pulses

Foliar spray of 1% urea on 30 and 45 days after sowing is recommended.

For rice fallow pulses in Delta area, foliar spray of 2% DAP once at flowering and another at 15 days thereafter is recommended and already in practice.

In redgram 1% MAP is recommended at 50% flowering and 15 days thereafter.

Cotton

Foliar application of 2% DAP + 1% KCl or polyfeed and Multi -K may be sprayed to improve kapas yield

New technology is needed to control the pod borer (Coimbatore)

Raising blackgram and green gram as intercrops along with redgram to serve as buffer crop for the build up natural enemies, erecting bird perches @ 20/ ha and need based application of chloroantrilproline @ 150 ml/ ha.

Single bloom varieties is needed/machine harvest (Coimbatore)

In green gram varieties VBN (Gg) 3 , CO 8, CO(Gg) 7 and in blackgram VBN 8, VBN 6, CO 6 and in red gram Co(Rg) 7 are synchronous maturing varieties and suitable for single/mechanical harvest.

Release of new variety with high yield potential, reduced flower drop, resistant to yellow mosaic virus (Coimbatore)

In blackgram VBN 8 (900kg/ha), VBN 6 (890kg/ha), CO 6 (733kg/ha) varieties are high yielding and resistant to yellow mosaic virus. Besides the culture COBG 10-05 are in advanced stage of evaluation.

In greengram CO 8 (843kg/ha), VBN (Gg) 3 (759kg/ha), VBN 2 (900kg/ha), CO (Gg) 7 (978kg/ha) are high yielding and YMV resistant types released for cultivation. The cultures viz., COGG 980, VGG 05-009 are under advanced stage of evaluation.

A new variety for substituting Co-CP7 Cowpea variety may be suggested (Dindugal)

The pre released culture VCP 09 – 013 (TLS 38 x VCP 16-1) is identified for release.

Yellow mosaic virus resistant variety may be evolved in black gram for summer cultivation (Dindugal, Theni, Salem, Ariyalur)

The released black gram varieties VBN 8 and VBN 6 are suitable for summer irrigated cultivation. The promising black gram cultures viz., TNJ 11029 and KKB-14-001 are under advanced stage of evaluation.

Short Duration (within 120 days), high yielding, suitable to Inter Cropping, Bund Cropping, variety in Red gram may be suggested (Dindugal)

The red gram CO (Rg) 7 is a popular short duration variety may be recommended for cultivation throughout Tamil Nadu.

Timely supply of breeder seed for pulses such as blackgram, greengram, cowpea (Vamban varieties) below 10 years variety (Theni)

The indented quantity of breeder seeds of Pulses is supplied to Department of Agriculture every year.

Development of latest High yielding and Rice fallow blackgram and green gram varieties (Thanjavur)

The black gram promising cultures *viz.*, ADBG 13-004 (VBN 1 x VBG 04-006) and KKB 05-011 (COBG 643 x VBN 3) suitable for rice fallow cultivation are under advanced stage of release.

The green gram promising cultures *viz.*, ADBG 13-034 and ADGG 13-009 (mutant of CO 7) suitable for rice fallow cultivation are under advanced stage of evaluation.

Development of biotic and abiotic stress tolerant Red gram varieties is immediately needed (Thanjavur)

In red gram, the pre released culture CRG 10-01 is high yielding (1720kg/ha) and resistant to SMD and root rot diseases and tolerant to Helicoverpa and Maruca pests. The identified drought tolerant red gram donors *viz.*, IC 525519, ICP 2455132, PUSA 2014-1, PUSA 992, IC 245531, PUSA 2014-1 are utilized in crossing program for development of drought tolerant types.

Development of Fertilizer responsive Pulses varieties (Thanjavur)

In redgram CO 6, VBN 2, in black gram Co 6, VBN 6 and in green gram Co 6, VBN 3 varieties responsive to fertilizer. Hence, may be recommended.

Multi location trials may be conducted for IPU 94-1 which has given better yield than VBN 5, VBN -6 & Resistant to YMV (Thanjavur)

The variety IPU 94-1 will be included in the OFT along with the advanced cultures developed for evaluation.

Salt tolerant pulse variety-salt water tolerant pulse varieties may be evolved. Because, in Ramanathapuram district, due to water scarcity, sometimes bore well water needs to be used to save crops (Ramnad)

The mutant lines in black gram namely TR 14 -003, TR 14-017, TR 14-037 were identified at ADAC&RI, Trichy as salt tolerant lines which are under advanced stage of evaluation.

YMV noticed in Khariff Season in YMV resistant variety VBN 4. Special study may be conducted in Madurai District (Madurai)

Hybridization with YMV resistant types namely VBN 4, VBN 6 and TU 31 were made and the selected progenies are under advanced stage of evaluation at AC &RI, Madurai.

Intensifying research on pulses for higher yield and keeping quality (Virudhunagar)

Intensified research on pulses is going on in TNAU centres namely NPRC Vamban, Dept. of Pulses Coimbatore, AC&RI Madurai and AC&RI Killikulam.

Non availability of Breeder seeds in improved High yielding Varieties in all pulses especially in redgram. In Rice fallow pulses, weed control is emerging as a major Problem due to the presence of Nut grass. Pod borer (blue butterfly) occurrence is noticed in the recent past in a great menace in rice fallow pulses. Mechanical harvesting is slowly picking up due to non availability labour, it needs proper technology for removal of foreign matters from the produce (Small size clay particle). Yellow mosaic virus still a major problem in delta region (Trichy)

The indented quantity of red gram CO(Rg) 7, Co 6, VBN 2 and VBN 3 are being supplied regularly to Department of Agriculture for further multiplication.

A Suitable Black gram Variety for Rice fallow with Shoot webber tolerant may be evolved (Trichy)

The black gram promising cultures viz., ADBG 13-004 (VBN 1 x VBG 04-006) and KKB 05-011 (COBG 643 x VBN 3) suitable for rice fallow cultivation are under advanced stage of release.

Suitable High yielding Red gram variety to be developed (Ariyalur)

The released red gram varieties CO (Rg) 7, VBN 3, CO 6 and VBN 2 may be recommended for cultivation

In red gram, the culture CRG 10-01 is high yielding (1720kg/ha) and resistant to SMD and Root rot diseases and tolerant to *Helicoverpa* and *Maruca* pests.

The promising long duration cultures viz., CRG 10-12, CRG 2012-25, CRG 2012-30 and CRG 2013-01 and short duration cultures namely CRG 2012 – 20, CRG 2013-12 are under advanced stage of evaluation.

In pulses the major pest problem is yellow mosaic virus. The conventional control measures are not effective. Effective control measures (or) developing a more resistant variety to this pest are needed (Kanchipuram)

The blackgram varieties namely VBN 4, VBN 6, VBN 5, VBN 8 and greengram varieties CO 8, Co(Gg) 7, CO 6, VBN 2 and VBN 3 are found to be resistant to yellow mosaic disease and hence may be recommended.

In Kanyakumari District, Rice Fallow Pulses cultivation is done in Yela conditions and the heavy summer rains received during April, May severely damages the crops and leads to crop loss or heavy reduction in yield as water stagnation persists for more than 24 hours. Hence Varieties tolerant to water Stagnation may be evolved (Kanyakumari)

The research on development of water stagnation tolerant blackgram culture is going at AC&RI, Killikulam. The sturdy basal stem type viz., KKB14-002 and KKB14-003 are under evaluation.

Suitable variety for Kharif season may be evolved (Villupuram)

The black gram varieties namely VBN 6 and VBN 8 may be recommended for cultivation during *Kharif* season.

Evolving alternate variety for ADT-3 and ADT-5- In Tiruvarur District, Black gram is cultivated in about 65000 Ha with ADT-3 and ADT-5 variety which was more than 20 years old. Alternate new variety for ADT-3 and ADT-5 has to be evolved with YMV resistance (Thiruvarur)

The black gram promising cultures viz., ADBG 13-004 (VBN 1 x VBG 04-006) and KKB 05-011 (COBG 643 x VBN 3) suitable for rice fallow cultivation are under advanced stage of release.

The released black gram varieties VBN 8 and VBN 6 are suitable for summer irrigated cultivation. The cultures viz., TNJ 11029 and KKB-14-001 are under advanced stage of evaluation.

Blackgram varieties like VBN-3, VBN (Bg)-4, VBN (Bg)-5 and ADT-5 have played major role to enhancement of present pulses production in Tiruvannamalai District. However, this is not sufficient to meet the requirement, for which more and more new high yielding Black gram varieties needed to our Rainfed areas (Thiruvannmalai)

The newly released blackgram varieties namely VBN 6 and VBN 8 are found to be resistant to yellow mosaic disease and suitable for rainfed and hence may be recommended.

Greengram is cultivated in around 6000 to 8000 Ha in Puduchatram, Elachipalayam and Rasipuram blocks during kharif season. VBN 2, CO GG 912 performs better in yield character but it is susceptible to Yellow mosaic virus. So Yellow mosaic virus

resistant, high yielding, synchronous maturity varieties may be evolved (Namakkal)

In green gram CO 8 (843kg/ha), VBN (Gg) 3 (759kg/ha) are high yielding and YMV resistant varieties released for cultivation. The cultures viz., COGG 980, VGG 05-009 are under advanced stage of evaluation.

Evolving alternate variety for ADT-3 - In Tiruvarur District, Green gram is cultivated in about 60000 Ha with ADT-3 which was more than 20 years old. Alternate new variety for ADT-3 has to be evolved (Thiruvarur)

The green gram promising culture ADGG 13-009 (Mutant of Co7) suitable for rice fallow cultivation are under advanced stage of evaluation.

Synchronized varieties should be evolved and popularized (Thiruvallur)

The released green gram variety CO 8 with early (55-60days) duration and synchronized maturity may be popularized.

Evolving short duration variety-In Tiruvarur District, the major crop grown is paddy. Normally red gram will be cultivated followed by paddy for which variety with 90 days duration suited for January-February sowing season is needed (Thiruvarur)

Red gram APK 1 with duration of 90-100 days may be recommended for cultivation. The super early varieties (90 days) are available from ICRISAT. ICPL 88039 and ICPL 87091 are extra early varieties.

Long duration, Location specific and high yielding varieties in red gram required (Krishnagiri)

In red gram, the culture CRG 10-01 is high yielding (1720kg/ha) and resistant to SMD and Root rot diseases and tolerant to *Helicoverpa* and *Maruca* pests.

LRG 41 variety has been widely popularized in Vellore for the past few years to replace SA1. Any other alternate variety on par with LRG 41 shall be suggested / evolved (Vellore)

In redgram, the culture CRG 10-01 is high yielding (1720kg/ha) and resistant to SMD and Root rot diseases and tolerant to *Helicoverpa* and *Maruca* pests.

SA1 variety is mainly grown in rainfed condition. But the average yield of Red gram was low as they were mostly raised as intercrops and not as pure crop. Hence, the Researchers are requested to develop a Red gram variety with synchronized maturity for one time harvesting and a variety possessing complete resistance to sterility

mosaic disease (SMD). VBN2 Red gram is also being introduced but its performance is not as good as SA1. Varieties suitable for Red gram transplantation shall be suggested with recommendations on spacing and seed rate (Vellore)

In red gram, the culture CRG 10-01 is high yielding (1720kg/ha) and resistant to SMD and Root rot diseases and tolerant to *Helicoverpa* and *Maruca* pests.

Evolve a suitable HYV of pulses for dry season to counter climate change (Vellore)

In red gram, the culture CRG 10-01 is high yielding (1720kg/ha) and resistant to SMD and Root rot diseases and tolerant to *Helicoverpa* and *Maruca* pests.

The released varieties of red gram CO 6, CO (Rg) 7, VBN 2, VBN 3 and black gram VBN4, VBN 6, VBN 8 and green gram VRM 1, VBN 2, VBN 3, CO 8, and CO 6 may be recommended for cultivation.

Short duration high yielding red gram varieties suitable for cultivation under rainfed conditions is required (Tiruppur)

Red gram APK 1 with duration of 90-100 days may be recommended for cultivation. The super early varieties (90 days) are available from ICRISAT. ICPL 88039 and ICPL 87091 are extra early varieties.

Varieties with resistance to pod – borer is required (Tiruppur)

In red gram, the culture CRG 10-01 is high yielding (1720kg/ha) and resistant to SMD and Root rot diseases and tolerant to *Helicoverpa* and *Maruca* pests.

Yellow mosaic is a serious problem in red gram. Varieties resistant to yellow mosaic are required (Tiruppur)

In red gram, the culture CRG 10-01 is high yielding (1720kg/ha) and resistant to SMD and Root rot diseases and tolerant to *Helicoverpa* and *Maruca* pests

Red gram Varieties well suited for transplanting technique may be evolved for both vegetable and grain purpose like Bangalore Redgram-1 (Salem)

The red gram culture CRG 2013-01 (180 days) suitable for both grain and vegetable type is under Multi location trial.

Short duration varieties with suitable transplanting technique have to be evolved (Thiruvannmalai)

Red gram varieties Co(Rg) 7 with short duration may be recommended.

Proper fertiliser recommendation for WSF is needed (Thoothukudi)

Experiments on synthesizing new water soluble fertilizers for crops are in progress. The new WSF will be tested and given for adoption in future

Recommendation of basal application of fertilizers for Rice fallow pulses- In Tiruvarur District, Rice fallow pulses is cultivated in about 115000 Ha with available residual moisture. For Rice fallow pulses basal application of fertilizers may be studied and recommendations may be provided (Thiruvarur)

- For rice fallow pulses, basal application of 25:50:25:20 kg NPKS/ha +25 kg N/ha in 3 equal splits on 30, 45 and 60 days after sowing + 2% DAP spray on 45 and 60 days after sowing.
- Application of recommended dose of P (50 kg P₂O₅) to thaladirice as 50% water soluble P fertilizer (SSP) and 50% as rock phosphate as basal will supply phosphorus to rice fallow pulses.

Short duration varieties suitable for rainfed conditions is required (Tiruppur)

In Black gram VBN 8 (900kg/ha), VBN 6 (890kg/ha), CO 6 (733kg/ha) varieties are high yielding and resistant to yellow mosaic virus. The culture COBG 10-05 is in advanced stage of evaluation.

In Green gram CO 8 (843kg/ha), VBN (Gg) 3 (759kg/ha), VBN 2 (900kg/ha), CO (Gg) 7 (978kg/ha) are high yielding and YMV resistant varieties released for cultivation. The cultures viz., COGG 980, VGG 05-009 are under advanced stage of evaluation.

Black gram ADT5 variety is predominant variety to get maximum yield. But Yellow mosaic virus is a prevailing problem. So suggest alternate variety resistant to Yellow Mosaic Virus in summer season (Nagapattinam)

The released black gram varieties VBN 8 and VBN 6 are suitable for summer irrigated cultivation. The cultures viz., TNJ 11029 and KKB-14-001 are under advanced stage of evaluation.

Black gram ADT3 and Green gram ADT3 variety is predominant variety in rice fallow season. Suggest alternate variety for varietal diversification (Nagapattinam)

The black gram promising cultures viz., ADBG 13-004 (VBN 1 x VBG 04-006) and KKB 05-011 (COBG 643 x VBN 3) suitable for rice fallow cultivation are under advanced stage of release.

The green gram promising cultures viz., ADBG 13-034 and ADGG 13-009 (Mutant of Co7) suitable for rice fallow cultivation are under advanced stage of evaluation.

Improvement of local variety (Konakai) and released as new variety (Dharmapuri)

Local cowpea type Konakai was evaluated along with Paiyur 1 variety at RRS, Paiyur. The yield performance of the local type was very low when compared with Paiyur 1. Paiyur 1 is high yielding, yellow mosaic virus resistant and suited for fodder purpose also.

Evolving new drought tolerant, disease resistant, high yielding variety suitable for Rabi season (Dharmapuri)

The promising culture KRI 2278 identified as high yielding type at RRS, Paiyur are under advanced stage of evaluation.

New High yielding variety which replaces local varieties may be evolved (Erode)

Paiyur 2 is the high yielding horse gram variety suitable for rainfed cultivation. The promising culture KRI 2278 identified as high yielding type at RRS, Paiyur are under advanced stage of evaluation.

Horse gram is cultivated in about 6000 Ha mostly under rainfed condition. High yielding varieties suitable for rain-fed conditions is required (Tiruppur)

Horsegram variety Paiyur 2 may be recommended for cultivation under rainfed condition. The promising culture KRI 2278 identified as high yielding type at RRS, Paiyur are under advanced stage of evaluation.

Predicting the correct time of sowing for black gram and green gram – Thanjavur

For *kharif* season (Adi pattam), sowing must taken up before July15 to get higher yield and to harvest the crop before the onset of north east monsoon.

For *rabi* season (Purattasi Pattam), Pre-monsoon sowing at 39th standard week is most suitable time for blackgram and greengram.

For Rice fallow pulses sowing at 7-10 days before rice harvest during January is ideal time for sowing.

Standardisation of measures to minimize transplanting shock in red gram in Madurai district –Madurai

Select long duration varieties only. Sow the seeds in polybags 30-45 days prior to transplanting and the transplanting must be without much disturbing the roots and TP completed before the month of August either under rainfed or irrigated conditions

USE OF WATER SOLUBLE FERTILIZERS AS FOLIAR SPARY TO INCREASE THE YIELD IN PADDY, PULSES AND COTTON- In Tirunelveli district farmers have started using water soluble fertilizers in paddy, pulses and cotton to increase the yield. Hence suitable recommendations for foliar spray of water soluble fertilizers in paddy, pulses and cotton crops may be evolved – Tirunelveli

Foliar spray of 1% (5kg/ha) TNAU pulse wonder (or) 1% all 19 fertilizer (19:19:19 NPK) may be adopted.

TECHNOLOGY FOR SOWING RICE FOLLOW PULSES IN PADDY FIELDS, HARVESTED BY COMBINED HARVESTER-In Tirunelveli District rice fallow pulses have been sown in 6000 ha every year. Since paddy fields are harvested using combined harvester, rice fallow pulses cultivation is affected. Hence suitable technology may be evolved for sowing of rice fallow pulses in paddy fields, harvested by the combined harvester – Tirunelveli

For Rice fallow pulses, sowing must be taken up at 7-10 days before rice harvest. Further research on correct time of sowing, right quantity of seed rate and method of establishment under combine harvest system will be taken up.

In Rice fallow pulses, weed control is emerging as a major Problem due to the presence of Nut grass - Trichy

To control sedges weeds in cropped conditions, no herbicide is available in the market. But to minimise the weed menace, following herbicide may be used for getting broad spectrum of weed control. Quizalofop ethyl herbicide @ 50 g ai/ha as early post emergence on 15-30 DAS (2-3 leaf stage of weeds) for controlling grassy weeds and imazethapyr herbicide @ 50 g ai/ha on 15-20 DAS (2-3 leaf stage of weeds)for controlling broad leaved weeds.

Redgram Transplanting technology is effective and gives good yield in irrigated conditions; this technology is not suitable in Rainfed condition - Karur

Transplanting technology in redgram is highly recommended for irrigated condition as well as for bi-model rainfall areas only like Dharmapuri, Krishnagiri and part of Vellore and Thiruvannamalai Dist. This technology is not suitable for Uni-model rainfall areas.

Short duration varieties with suitable transplanting technique have to be evolved - Thiruvannamalai

Transplanting technology in redgram is recommended for long duration varieties only. However, research attempt will be made to establish suitable transplanting technique for short duration redgram varieties.

Suitable post emergence weedicide with recommended dose is to be standardised - Villupuram

For controlling grassy weeds, application of quizalofop ethyl herbicide @ 50 g ai/ha as early post emergence on 15-30 DAS (2-3 leaf stage of weeds) is recommended. To control broad leaved weeds, imazethapyr herbicide @ 50 g ai/ha on 15-20 DAS (2-3 leaf stage of weeds) is recommended.

Suitable multi bloom technology for improvement of flowering and pod setting during Rabi Season in Blackgram may be evolved – Villupuram

The crop must be grown as normal crop and fertilizer should be applied as per the recommendation for irrigated crop (25:50:25 & 20 kg NPK&S/ha). In addition to that, top dressing of nitrogen fertilizer to be done with an extra dose of 25 to 30 kg through urea on 40-45 days after sowing. Since pulse crops are indeterminate in nature and continue to produce new flashes within 20-25 days.

Recommendation of basal application of fertilizers for Rice fallow pulses- In Tiruvarur District, Rice fallow pulses is cultivated in about 115000 Ha with available residual moisture. For Rice fallow pulses basal application of fertilizers may be studied and recommendations may be provided – Thiruvarur

The very purpose of growing pulses under rice fallow situation is to utilize the residual soil moisture as well as nutrients after the harvest of preceding rice crop. Moreover, basal application of fertilizer may induce re-growth of rice stubble and it may quickly exhaust the residual soil moisture leads to terminal drought in rice fallow pulses. Foliar application may be practiced as per recommendations.

Proper fertiliser recommendation for WSF is needed - Thoothukudi

More than 95% of the greengram and blackgram area comes under rainfed situation, where application of water soluble fertilizers are not recommended for pulses. However, 1% pulse wonder (5kg/ha) (or) 1% all 19 Fertilizer (19:19:19 NPK) at the time of 50 per cent flowering is recommended as foliar spray.

Proper terminal drought management technologies needed – Thoothukudi

Foliar spray of either 1% PPFM or 1% KCl is recommended for mitigating terminal stress.

Weed control is difficult in pulses cultivation since it is not economical. Hence suitable low cost weed control measures are required – Tiruppur

Pre emergence application of Pendimethalin @ 1.0 kg ai/ha (or) Pendimethalin 30 EC + Imazethapyr 2 EC (ready -mix) @ 1.0 kg ai/ha on 3 days after sowing followed by one

hand weeding. If labour availability is a severe problem, application of early post emergence herbicide viz., Quizalofop ethyl herbicide @ 50 g ai/ha on 15-30 DAS for grassy weeds control and imazethapyr herbicide @ 50 g ai/ha on 15-20 DAS for broad leaved weeds control may be adopted

Promotion of Sulphur application in pulses. Sulphur application @20kg/ha (Irrigated), @ 10kg/ha (Rainfed) FLD by KVK required – Madurai

The following basal fertilizer recommendation for increasing the productivity of pulses is already in practice.

Rainfed : 12.5 kg N + 25 kg P₂O₅ + 12.5 kg K₂O +10 kg S*/ha

Irrigated : 25 kg N + 50 kg P₂O₅ + 25 kg K₂O + 20 kg S*/ha

*Note : Applied in the form of gypsum if Single Super Phosphate is not applied as a source of phosphorus

These recommendations were already tested and confirmed by conducting FLD's in the farmers fields only.

USE OF WATER SOLUBLE FERTILIZERS AS FOLIAR SPARY TO INCREASE THE YIELD IN PADDY, PULSES AND COTTON- In Tirunelveli district farmers have started using water soluble fertilizers in paddy, pulses and cotton to increase the yield. Hence suitable recommendations for foliar spray of water soluble fertilizers in rice, pulses and cotton crops may be evolved – Tirunelveli

Rice

Research work is already in progress including WSF 19 :19:19 at the Dept. of SS&AC for evaluating WSF as foliar spray in rice.

Pulses

Foliar spray of 1% urea on 30 and 45 days after sowing is recommended.

For rice fallow pulses in Delta area, foliar spray of 2% DAP once at flowering and another at 15 days thereafter is recommended and is already in practice.

In redgram 0.5% MAP is recommended at 50% flowering and 15 days thereafter.

Cotton

Foliar application of 2% DAP + 1% KCl or polyfeed and Multi -K may be sprayed to improve kapas yield.

Combined inoculum of Bio fertilizer and PPFM or Carrier based PPFM for seed treatment

Trials were conducted in blackgram and greengram during the kharif 2014 to evaluate the effect of seed treatment of different bioinoculants viz., *Rhizobium* , phosphobacteria, PGPR, potassium releasing bacteria (KRB) @ 30gm /Kg of seed and PPFM as a foliar spray(2%) at the time of flowering (40-45th DAS) on nodulation and yield. The results showed that the combined application of *Rhizobium* + PSB + PGPR

+KRB+ PPFM exhibited maximum crop response, when compared to other treatments. The combined application of *Rhizobium* + PSB + PGPR +KRB+ PPFM recorded a maximum yield of 958kg/ha, total plant dry weight of 2038 kg /ha and 17.08 nodules / plant. The application of *Rhizobium* + PSB + PGPR +PPFM (without KRB) registered 870 kg/ha of yield and 1848.40kg/ha of halum weight. The grain yield of 746.80 kg /ha was recorded in Control. The results also showed that in addition to *Rhizobium* , application of other bioinoculants like PSB, KRB and PPFM significantly increased the nodulation and yield of blackgram and greengram.

Recommendation of basal application of fertilizers for Rice fallow pulses- In Tiruvarur District, Rice fallow pulses is cultivated in about 115000 Ha with available residual moisture. For Rice fallow pulses basal application of fertilizers may be studied and recommendations may be provided – Thiruvarur

As the rice fallow pulse is grown with residual moisture and residual nutrients only, application of DAP @ 50 kg / ha before the last irrigation to paddy has recorded increased yield of Black gram under rice fallow condition.

Application of recommended dose of P (50 kg P₂O₅) to thaladi rice as 50% water soluble P fertilizer (SSP) and 50% as rock phosphate as basal will supply phosphorus to rice fallow pulses.

Apply 1% KCl + 2% DAP + 40 ppm NAA (Planofix) at 25 and 45 days after sowing as foliar spray.

OILSEEDS

Suitable varieties for rainfed Groundnut (Below 10 Years) (Theni)

New bunch variety CO 7 may be recommended

High yielding varieties and hybrids in oilseeds may be developed (Thanjavur)

High yielding variety in groundnut - CO 6, CO 7 and VRI 8; High yielding variety in sesame - TMV 7; High yielding hybrid in sunflower - CO 2 Hybrid are available.

Identification of the varieties having high germination percentage (Thanjavur)

All varieties are with good germination only. Proper post harvest management practices need to be followed to maintain good germination.

Groundnut variety equivalent to TMV-7 which is suitable to Ramanathapuram may be evolved (Ramnad)

CO 7 and VRI 8 may be recommended to replace TMV 7.

Replacement of varieties for TMV.2, TMV.7 and VRI.2 under rainfed condition (Villupuram)

CO 7 may be recommended.

New varieties with higher yield potential may be released.(equivalent to TMV 7). Renotification of TMV 7 may be done (Coimbatore)

New promising high yielding bunch variety VRI 8 may be recommended.

High Yielding, High Oil content, Bold, Compact, uniform maturity variety may be evolved for substituting TMV-7 variety (Dindugal)

New bunch high yielding potential varieties CO 7 and VRI 8 may be recommended.

Drought Tolerant HYV best suited for rainfed condition may be Evolved (Erode)

Drought tolerant semi spreading variety CO 6 may be used for rainfed condition.

Karambakudi block in Pudukkottai District facing the problem of dry root rot (Macrophomina Phaseolina) disease in Groundnut. Recommended management practices like seed treatment, spot drenching, etc., doesn't give any result. Hence resistant variety may be suggested to overcome the dry root rot disease in Groundnut (Pudukkottai)

Resistant variety for dry root rot is not available at present in groundnut.

Suitable control measure for Collar rot (*Aspergillus niger* var *teigham*) in groundnut and resistant variety may be suggested (Pudukkottai)

Resistant variety for collar root rot is not available at present in groundnut.

Farmer preferred, below 10 years Groundnut variety is needed (Like TMV7) (Karur)

CO 7 and VRI 8 are recommended to replace TMV 7.

Although many Groundnut semi-spreading and bunch varieties have been released, Rain fed Groundnut area of Tiruchengode, Elachipalayam and part of Paramathi blocks farmers are interested in growing TMV 1 variety (Spreading type) because of its rejuvenating character during prolonged drought season and giving minimum guarantee yield during moisture stress. Hence this TMV1 variety may be modified and released as "Improved TMV 1 Variety" (Namakkal)

TMV 1 may be replaced by semi spreading varieties CO 6 and VRIGN 7.

IMPROVED TMV 7 MAY BE EVOLVED-Among all oil seeds Groundnut is an important oil seed in Namakkal District. Groundnut is being cultivated both under Irrigated and rainfed condition. Farmers prefer to grow TMV 7 which is a very old variety. Hence improved TMV 7 may be evolved and released for Namakkal Dt. (Namakkal)

Bunch varieties CO 7 and VRI 8 are recommended which are better than TMV 7.

Suitable alternate variety for TMV 7 better than TMV 13 needed (In Thoothukudi dt - TMV 13 low yield) (Thoothukudi)

Alternate variety for TMV 7 is VRI 8, which is bunch type and high yielding potential.

Groundnut is an important Oil seed crop in Tirunelveli district. Groundnut is being cultivated both under irrigated and rainfed condition. Farmers in Tirunelveli district prefer to grow TMV 7 which is a unique variety with rose colour kernel and 2 seeded pod. It is also a bunch type groundnut variety with an oil content of 50% but TMV 7 is a very old variety.Hence, a suitable alternate groundnut variety having better performance than TMV.7 variety evolved, to suit both the irrigated and rainfed condition (Tirunelveli)

CO 7 and VRI 8 may be recommended to replace TMV 7.

Suitable variety to be identified with 100 days duration and 30 days dormancy period after harvest (Sivaganga)

Development of Bunch variety with dormancy is in progress.

Groundnut white and bold kernels with highly resistant to white grub and leaf minor varieties to be evolved (Thiruvannamalai)

Bold seed semi spreading variety CO 6 may be recommended with white grub and leaf minor management practices.

New white seeded gingelly variety best alternative for SVPR.1 may be evolved (Erode)

A white seeded promising culture VS-07-023 has been identified as better than SVPR -1 in adaptive research trials. It will be proposed for variety release during this year.

Gingelly is cultivated in more than 3000 ha both under rainfed and irrigated condition in Salem District. SVPR-1 is the most preferred white seeded variety. But this is an age old variety. Hence, a highly suitable high yielding variety may be evolved to replace it.

As per the Central Government direction, production and distribution subsidy can be given only for the less than 10 year old varieties under all schemes (Salem)

A white seeded promising culture VS-07-023 was identified as better than SVPR -1 in adaptive research trials. It will be proposed for variety release during this year.

Studies should be conducted on irrigation, fertilizer and pesticides in oil seed crops – Thanjavur

Studies on major and micro nutrients were conducted and the fertilizer recommendation has been refined during 2012 as 25:50:75 kg NPK/ha. N and K in three splits viz., 50 % N & K as basal + 25 % N and K at 20 DAS + 25 % N and K at 45 DAS is recommended. TNAU micronutrient mixture @ 12.5 kg/ha is recommended.

**Development of drought and high rainfall tolerant varieties /hybrids
Proper studies should be conducted on the requirement of major and micro nutrients – Thanjavur**

Studies on major and micro nutrients were conducted and the fertilizer recommendation has been refined during 2012 as 25:50:75 kg NPK/ha. N and K in three splits viz., 50 % N & K as basal + 25 % N and K at 20 DAS + 25 % N and K at 45 DAS is recommended. TNAU micronutrient mixture @ 12.5 kg/ha is recommended.

Development of implements for levelling and sowing of oil seeds - Thanjavur

Tractor operated cultivator seed planter can be used for mechanised sowing in groundnut. Highly suitable for sowing groundnut without damage to kernels.

Altering crop geometry to suit mechanization for earthing up operation - Madurai

Machineries are available to perform intercultural operations with the recommended spacing of 30 X 10 cm further refinement will be made based on constraint basis

Trench type of irrigation 2' width and 3' depth - Whether it is better than Basin type - Study may be conducted – Madurai

For improving the peg and pod development basin type is not suitable. Earthing has to be done for better pegging and pod development in groundnut. After earthing up irrigation is done through furrows.

Popularization of seed drill with adequate modification in hoppers as per seed recommendation is needed - Madurai

Tractor operated cultivator seed planter can be used for mechanised sowing in groundnut. Row to row spacing and plant to plant spacing can be altered.

Early post emergence weedicide and its recommendation at the time of later stage (Flowering stage) is to be needed - Villupuram

Early post emergence herbicide Imazethapyr @ 750 ml/ha may be applied at 20-30 DAS.

New varieties with higher yield potential may be released.(equivalent to TMV 7). Renotification of TMV 7 may be done - Coimbatore

New high yielding groundnut variety VRI 8 has been released this year 2016. It recorded an average yield of 2130 kg/ha in rainfed and 2700 kg/ha in irrigated condition.

**Improved machineries to avoid seed damage
power operated machine is required.
simple & low cost mechanical device is required - Coimbatore**

Tractor operated cultivator seed planter can be used for mechanised sowing in groundnut. Highly suitable for sowing groundnut without damage to kernels.

Low Cost Seed drill for sowing Groundnut line sowing and proper fertilizer placement need to be designed and Harvester may be suggested - Dindugal

Tractor operated cultivator seed planter can be used for mechanised sowing in groundnut. Row to row spacing and plant to plant spacing can be altered.

High Yielding, High Oil content, Bold, Compact, uniform maturity variety may be evolved for substituting TMV-7 variety - Dindugal

New high yielding groundnut variety VRI 8 has been released this year 2016. It recorded an average yield of 2130 kg/ha in rainfed and 2700 kg/ha in irrigated condition with 49 % Oil content.

Drought Tolerant HYV best suited for Rainfed condition may be Evolved - Erode

Drought tolerant groundnut variety CO 6 has already been released during 2010. It is a semi-spreading variety suitable for rainfed situations with a mean pod yield of 1915 kg/ha.

Karambakudi block in Pudukkottai District facing the problem of dry root rot (*Macrophomina Phaseolina*) disease in Groundnut. Recommended management practices like seed treatment , spot drenching, etc., doesn't give any result. Hence resistant variety may be suggested to overcome the dry root rot disease in Groundnut – Pudukkottai

Research is being carried out to transfer resistance for dry root rot to a susceptible variety VRI 2 through hybridization and selection .

Suitable control measure for Collar rot (*Aspergillus niger var teigham*) in Groundnut and resistant variety may be suggested - Pudukkottai

Action has been initiated to develop high yielding varieties to collar rot resistance.

New white seeded gingelly variety best alternative for SVPR.1 may be evolved - Erode

White seeded sesame VS 07 023 is proposed for release during next year which will be an alternative to SVPR 1.

Farmer preferred, White seeded, below 10 years Gingelly variety is needed (Like SVPR1) – Karur

White seeded sesame VS 07 023 is proposed for release during next year which will be an alternative to SVPR 1.

Refinement of Technologies for cultivation of Gingelly through Transplantation method-Technologies for cultivation of Gingelly through Transplantation method has to be evolved – Thiruvarur

Transplantation technologies were tried but it is not remarkable. Sesame seed pelleting technologies and suitable method of sowing is under OFT.

Gingelly is cultivated in more than 3000 ha both under rainfed and irrigated condition in Salem District. SVPR-1 is the most preferred white seeded variety. But this is an age old variety. Hence, a highly suitable high yielding variety may be evolved to replace it. As per the Central Government direction, production and distribution subsidy can be given only for the less than 10 year old varieties under all schemes – Salem

White seeded sesame VS 07 023 is under ART which will be an alternative to SVPR 1.

Studies should be Conducted on irrigation, fertilizer and pesticides in oil seed crops – Thanjavur

Studies have already been conducted on fertilizer recommendation of oilseed crops besides studies on irrigation and pesticides. Please refer the “Crop Production Guide - 2012”.

Proper studies should be conducted on the requirement of major and micro nutrients - Thanjavur

For individual oilseed crops, fertilizer recommendations (both major, secondary and micronutrients) has already been given in the “Crop Production Guide-2012” based on the research outcome of multi location trials.

COTTON

- **Development of cotton genotypes for high density planting - Coimbatore**
- **Development of hybrids and varieties suitable for machine picking - Thanjavur**
- **Development of short duration, short statured and compact cultivars in tetraploid cotton to achieve quantum jump in the productivity by adopting closer spacing - Thanjavur**
- **Development of cotton genotypes for high density planting - Virudhunagar**
- **Development of variety having symbodial branch only - Madurai**
- **Variety with single picking character may be identified - Dharmapuri**
- **Need a variety with uniform maturity and uniform boll bursting – Thoothukudi**

The compact cultures TCH 1819 and TCH 1822 suitable for High Density Planting (HDP) are under ART. These cultures are suitable for high density planting and mechanised harvest. Special features of these cultures which matures in 130-135 days are

* TCH 1819: seed cotton yield of 2310 kg/ha with a span length of 27.3 mm and a bundle strength of 19.7 g/tex.

* TCH 1822: seed cotton yield of 2331 kg/ha with 27.5 mm span length and 19.5 g/tex bundle strength.

- **In Cotton, Surabi is ruling variety cultivated during summer season. Now-a-days its yield potentiality is getting into downstream. In this regard, new high yielding, variety may be recommended to this tract – Namakkal**
- **Suitable extra long staple super fine cotton to be developed – Trichy**
- **Evolving high yielding extra-long staple cotton varieties to replace private hybrids- During July and August month cotton has been cultivated in Ariyalur, Sendurai and Thirumanur blocks. Farmers used to grow Private Hybrids only (Medium staple cotton variety).Hence a suitable extra-long staple cotton variety with BT**

technology is required – Ariyalur

- In Vellore 100% of the cotton area is under BT cotton. Hence suitable variety / hybrid shall be evolved / suggested for Vellore District – Vellore
- Hybrid variety suitable for Kharif season which is equivalent or better than BT cotton for Rainfed sowing may be suggested for Nallur and Mangalore blocks – Cuddalore
- Varietal cotton with BT may be evolved suitable to our tract for summer irrigated cotton – Dharmapuri

Tamil Nadu Agricultural University is not undertaking any attempt to evolve hybrids/varieties with Bt gene as per the policy of Government of Tamil Nadu. SVPR 2 and KC 3 is recommended for rainfed area of Vellore district.

- Hybrid variety suitable for Kharif season which is equivalent or better than BT cotton for Rainfed sowing may be suggested for Nallur and Mangalore block - Cuddalore
- Varietal cotton with BT may be evolved suitable to our tract for summer irrigated cotton – Dharmapuri
- High yielding hybrids available with affordable costs - Thanjavur

An intra *hirsutum* hybrid TSHH 0629 has been accepted for central release during 2015. Its features are: seed cotton yield 2275 kg/ha, 2.5% span length : 28.5mm, bundle strength : 21.2 g/tex, duration : 165 days and moderately resistance to jassids.

- Development of hybrids and cultivars resistant to moisture stress conditions – Thanjavur

Already released KC 3 cotton variety can come up very well in moisture stress situation with sustainable yield (Yield -1081 kg/ha; span length -27.4mm; duration- 140 days). Recently identified *G.arboreum* cotton culture TKA 9102/3 which is presently under ART has the potential of yielding upto 1193 kg/ha with 27.7mm fibre length and 22.1 g/tex fibre strength. This culture will be tested under NFSM-FLDs as well. Hybrids, in general, cannot withstand the moisture stress.

- Non availability of Improved variety seeds for multiplication. Hence suitable Daincha varieties may be evolved for green manure seed production – Trichy
- In Tirunelveli District, Daincha has been grown as green manure crop in major blocks. Every year, we get green manure seeds production and distribution scheme in the state schemes. For this we need a variety with specific characters in Daincha. Hence suitable Daincha varieties may be evolved for green manure seed production – Tirunelveli

Efforts will be taken to evolve better varieties in Daincha. The released CO 1 variety of Sunhemp (*Crotalaria juncea*) can be utilized. Features of SunN hemp (CO 1): Possesses a higher total nitrogen content (1.68 per cent). Makes available increased nitrogen content of soil (15.5 per cent). Under NADP sufficient green manure seeds (Daincha and sunhemp CO 1) are made available to the farmers by the University.

Low cost PP Chemicals – Coimbatore

Plant protection chemicals recommended in the Crop Production Guide by TNAU are based on cost benefit factors. Need based, selective and judicious use of insecticides would result in low input cost. Use correct dose with right insecticide, synchronize with the weak stage of the pest (early instar larvae) and ensure uniform coverage with small spray particles of uniform size. Use of selective insecticides will be relatively safe to the natural enemies.

In Bt. Cotton BG-I, BG-II are affected by boll worms (*Spodoptera litura*, *Helicoverpa armigera*) and the problem is persistent for the past two years, remedy required to overcome this problem – Perambalur

Usually the two indicated are supposed to be controlled by the *Bt* genes. Only pink bollworms are reported in later stage of the crop growth. In case, if the two pests are found even in the *Bt* cotton, the IPM technology suggested for managing the pests in non *Bt* crop comprising use of pheromones to monitor the pests, raising trap crops recommended for the respective pests, release of egg parasitoids, followed by NPV against early instar and need based application of chemical insecticides also is applicable.

Cotton Mealy bug-In Ramanathapuram district, cotton is cultivated nearly in 2000 Ha in Masi pattam. In this pattam, cotton mealy bug is a big problem. Every year, this cotton mealy bug is affecting the cotton crop. Hence, suitable resistant varieties and control measures may kindly be evolved – Ramnad

Continuous breeding programme is undertaken in developing resistant lines against the major pests including the mealybug. In case of severe epidemic the following measures be adopted to manage the pests.

Removal of alternate weed host like, *Abutilon indicum* (Thuthi) and *Solanum nigrum* (Manathakkali) in the vicinity of cropped area.

Monitoring emergence of crawlers at basal stem.

Use of neem oil 2%, NSKE 5% and fish oil rosin soap 25g /l.

Release of encyrtid parasitoid, *Acerophagus papayae* @ 100 per village.

Spraying of dimethoate 30 EC or profenofos 50 EC 2ml / l thoroughly drenching the crop using high volume sprayer.

High yielding extra long staple cotton variety to replace MCU 5 -In Tirunelveli District, during masi pattam, cotton has been cultivated in some blocks. Farmers use to grow MCU5 (an extra long staple cotton variety) which is an old variety. Hence a suitable extra long staple cotton variety to replace MCU5 may be evolved – Tirunelveli

In Cotton, Surabi is ruling variety cultivated during summer season. Now-a-days its yield potentiality is getting into downstream. In this regard, new high yielding, variety may be recommended to this tract – Namakkal

Suitable extra long staple super fine cotton to be developed – Trichy

High yielding extra long staple CO 14 cotton variety is released during this year (2016). The average seed cotton yield of this variety is 1768 kg/ha. This variety recorded the highest span length of 35.0mm and bundle strength of 22.7 g/ tex as against 33.9mm fibre length and bundle strength of 21.9 g/tex of MCU 5 variety. This is an alternate variety for MCU 5.

High yielding hybrids available with affordable costs - Thanjavur

An intra *hirsutum* hybrid TSHH 0629 has been accepted for central release during 2015. Its features are seed cotton yield 2275 kg/ha, 2.5% span length : 28.5mm, bundle strength : 21.2 g/tex, duration : 165 days and moderately resistance to jassids.

Development of hybrids and cultivars resistant to moisture stress conditions – Thanjavur

Already released KC 3 cotton variety can come up very well in moisture stress situation with sustainable yield (Yield -1081 kg/ha; span length -27.4mm; duration- 140 days). Recently identified *G.arboreum* cotton culture TKA 9102/3 which is presently under ART has the potential of yielding upto 1193 kg/ha with 27.7mm fibre length and 22.1 g/tex fibre strength. This culture will be tested under NFSM-FLDs as well. Hybrids, in general, cannot withstand the moisture stress.

Fertilizer scheduling for drip fertigation in winter irrigated cotton – Perambalur

Fertigation schedule for irrigated cotton

Recommended dose of fertilizer- 120: 60: 60 NPK kg ha⁻¹

Stage	No. of Split	Days	N (per cent)	P (per cent)	K (per cent)
Seedling	1	14	5	12.5	2.5
	2	21	5	12.5	2.5
Vegetative	3	28	2.85	12.5	3.57
	4	35	2.85	12.5	3.57
	5	42	2.85	5	3.57

	6	49	2.85	5	3.57
	7	56	2.85	5	3.57
	8	63	2.85	5	3.57
	9	70	2.85	5	3.57
Boll formation	10	77	9	5	6
	11	84	9	5	6
	12	91	9	5	6
	13	98	9	5	6
	14	105	9	5	6
Maturity	15	112	5		8
	16	119	5		8
	17	126	5		8
	18	133	5		8
	19	140	5		8

Foliar nutrition recommended for winter rainfed cotton to enhance cotton yield and quality – Perambalur

Spray 0.5% urea and 1% KCl on the 45th and 65th day of sowing if sufficient moisture is available.

Correct Fertilizer schedule may be developed for hybrid cotton – Thanjavur

Application of 120:60:60 kg N, P₂O₅ and K₂O ha⁻¹

- i). If basal application could not be done, apply on the 25th day after sowing.
- ii) Apply N in three splits *viz.*, basal, 45 and 65 DAS, K in two splits basal and at 40 – 45 DAS and full dose of P₂O₅ as basal.
- iii). ZnSO₄ 25 kg ha⁻¹ along with 0.15% Boron foliar spray twice at early and peak boll forming stages.

INM Package required for Rice fallow cotton - – Thanjavur

- a) Seed treatment with 3 packets of Azospirillum (600 g/ha) and 3 packets (600 g/ha) of Phosphobacteria or 6 packets of Azophos(1200 g/ha). In addition apply and 10 packets of Azospirillum (2000 g/ha) and 10 packets (2000 g/ha) of Phosphobacteria or 20 packets of Azophos (4000 g/ha) mixed with 25 kg FYM and 25 kg of soil on the seed line. This saves 25% nitrogen besides increasing yield.
- b) Apply NPK fertilisers as per soil test recommendations. If soil test is not done follow the blanket recommendation of 60:30:30 kg NPK/ha.
- c) Apply half the dose of N and K full dose of P₂O₅ at 35th day in old delta and balance in 55 days the rows of cotton plants. In the case New delta apply full P and 1/3 of N and K at 20 DAS and 2/3 N and K at 40 DAS.

Application of TNAU MN mixture (12.5 kg ha⁻¹ as EFYM for variety and 15 kg ha⁻¹ as EFYM for hybrids) and TNAU PGR foliar formulation @1.25 % concentration at square and boll formation stages along with the recommended NPK to obtain the maximum seed cotton yield with reduced extent of leaf reddening.

SUGARCANE

White grub infestation manifests manifold immediately after the rain followed by summer. Detection of symptom is difficult in the early stages – Cuddalore

Monitoring of the incidence of white grub should be made before the onset of summer showers preferably third week of March of each year. The same should be intensified after the receipt of first summer shower.

Initially, the white grub affected sugarcane leaves show yellowing, followed by drying of leaves in the tillers and entire clump.

To confirm the damage by white grub, the affected clump should be removed and soil below root portion should be excavated upto a depth of 15-30 cms to collect the white grubs.

Monitoring of white grub adults by setting light trap and also adult activities on neem and Acacia trees is also suggested for early detection of the incidence of white grub.

Management of Yellow Leaf Disease - Cuddalore

Selection of planting materials only from disease free nurseries. Spraying dimethoate 30 EC @ 2 ml/l of water for managing the aphid vector.

Management technologies to overcome the Pest incident White grub, Stem borer, Scales insect problem – Perambalur

Early season planting (Dec-Jan) Trash mulching on ridges on 3 DAP Intercropping with green gram, black gram, daincha effectively checks shoot borer. Installation of early shoot borer sex pheromone traps @ 20/ha for monitoring of pest density. Spray granulosis virus at 1.5 x 10¹² PIB/ha twice on 35 and 50 days after planting (DAP) or release 125 gravid females of *Sturmiopsis inferens* /ha on 30 and 45 DAP. Applying any one of the following insecticides: Soil application of Carbofuran 3 G 33 kg/ha. Chlorpyrifos 10 G 12.5 Kg/ha. Spraying Chlorpyrifos 20 EC 1000 ml Phosalone 35 EC 1000 ml NSKE 5 % 25 Kg/ha Scale insect, Selecting scale insect free setts, Keeping bunds free from weeds 3. Avoiding repeated rations, Detrashing the crop at 5th and 7th month after planting, Draining excess water, Avoiding water stagnation, Presoaking the setts in 0.1% malathion solution and Spray Dimethoate 30 EC @ 2ml/lit of water (120/150 day after detrashing).

Control measures or repellent to control the Wild Boar menace as well as forest

animals – Villupuram

Concerns with Wild Life Act. Creation of physical barrier may facilitate in avoiding the damage.

Shoot borer tolerant Varieties are required – Trichy

CoC (Sc) 24 is tolerant to Early shoot borer.

Farm mechanization needed for easy crop production – Coimbatore

Farm mechanization is done with the help of following machineries

1. Elimination of Old Cane Stubbles- five passes of light and heavy disc harrows with a 55 HP tractor
2. Land Preparation: - Nine tyne spring loaded cultivator mould board plough, disc plough, heavy disc harrow, duck foot tillers, rotavators, blade tracers, land planer, bund former, trencher, ridger, furrower and other local tillage tools
3. Interculture Operation:
 - i) Earthing Up: Bund former
 - ii) Weeding: Animal or tractor operated junior hoe or cultivators. Use of self propelled rotary weeder and lightweight power tillers, tractor tillers
4. Irrigation: Through surface and sub surface drip fertigation.
5. Ratoon Management: Trash shredders was introduced to powder the trash. It paved a way for *in situ* trash mulching. Use of stubble shaver, with attachment for off baring stubble shaving is done
6. Cane Harvesting: Mechanical harvesting with combined harvester 8000/4000 series.

Management of Weed – Cuddalore

Major weed flora observed in sugarcane fields are: Sedges- *Cyprus rotundus*; Grasses- *Cynodon dactylon*, *Sorghum halepense*, *Panicum spp*, *Dactyloctenium aegyptium*, Broad leaved weeds - *Chenapodium album*, *Convolvulus arvensis L.*, *Amaranthus viridis L.*, *Portulaca oleraceae L.*, *Commelina bengalensis L.*, *Trianthema portulacastrum L.*

Management of Weed

- Wherever weed menace is higher, one line weeding along the crop row and spade digging of ridges have to be done on 30, 60 and 90 DAP
- Spray Atrazine 2 kg or Oxyflurofen 750 ml/ha mixed in 600 liters of water as pre emergence herbicide on the 3rd day of planting, using deflector or fan type nozzle fitted with knapsack sprayer.
- If herbicide is not applied work the junior-hoe along the ridges on 25, 55 and 85 days after planting for removal of weeds and proper stirring. Remove the weeds along the furrows with hand hoe. Otherwise operate power tiller fitted with tynes for inter

cultivation.

- For control of creeper weeds, post emergence application of fernoxone (2, 4 –D sodium salt) @ 2 gm + 10 gm of urea per liter of water may be sprayed over the creeper weeds

Grassy weeds particularly Johnson's weed in the Delta Area – Cuddalore

Johnson's Weed (or) *Sorghum halopense* will be controlled by 2/3 row cultivation besides 2 or 3 manual weeding. Mechanical method plus herbicides offers effective weed control measures.

Pre- plant application of glyphosate at 2.0 kg ha⁻¹ along with 2% ammonium sulphate at 21 days before planting of sugarcane followed by post emergence direct spraying of glyphosate at 2.0 kg ha⁻¹ along with 2% ammonium sulphate with a special hood on 30 DAP suppressed the Johnson's Weed and provided weed free environment.

Management of Yellow Leaf Disease

It is prevalent in the high sugar varieties (Co-86032)

Occurs in all season, particularly in the 7 to 8 months old crop – Cuddalore

Selection of planting materials only from disease free nurseries.

Spray Dimethoate 30 EC @ 2 ml/l of water for managing the aphid vector.

High Sugar content, Red rot resistant, short duration High Yielding variety suitable to Dindigul District may be suggested - Dindigul / Vellore

Co 0212 - New variety released by Sugarcane Breeding Institute, Coimbatore

C 29442 - Pre-release variety developed by SRS, Cuddalore.

IPM technology for the control of Mealy Bug, Botanical Bio pesticides, other than Neem is required – Dindigul

IPM of sugarcane mealy bug

1. Selection of mealy bug free seed canes for planting.
2. Settle treatment with 0.1% malathion at the time of planting.
3. Avoid excessive use of nitrogenous fertilizers
4. Drain excess water.
5. Detrash the crop at 5th and 7th month after planting.
6. Spray malathion 50 EC @ 1 lit /ha.

Integrated weed management strategies for *Striga* management – Dharmapuri

The parasitic weed striga is a problem, post-emergence application of 2,4-D sodium salt @ kg/ha in 500 litre of water/ha may be done. 2, 4-D spraying should be avoided when neighboring crop is cotton or bhendi. Apply 20% urea also for the control of striga as direct spray.

Mass multiplication of bio control agent for woolly aphid-In Namakkal Dt. the Incidence of woolly aphid problem was seen. The suitable control measures were taken. The Bio control Agent *Dipha aphidivora* may be mass multiplied and supplied to affected areas. Adequate quantity of *Dipha aphidivora* may be supplied to farmers during massive attack – Namakkal / Tiruppur

The bio agent, *Dipha aphidivora* occurs naturally as the incidence of sugarcane woolly aphid persist in sugarcane crop. The predator should be conserved and multiplied under natural field conditions by confining in green net house. The predators further spread to the other parts of field and other areas for effective control of woolly aphid. The farmers can be trained by TNAU to identify the predator and methods of mass culture of the same under field conditions.

Designing suitable combined harvester for sugarcane-Suitable Sugarcane harvester may be evolved to suit to harvest the crop at all row spacing in minimum land area also to overcome the labour problem – Namakkal / Ariyalur

Request will be made AMRC, Agricultural Engineering, TNAU, Coimbatore to design mechanical harvester with low cost.

Management technologies to overcome the Pest incident White grub, Stem borer, Scales insect problem – Perambalur

Integrated Management of white grub

- Mechanical collection of easily detectable third instar grubs in the fields showing yellowing and drying of clumps late in the season will reduce perpetuation of the pest.
- Large scale mechanical collection of beetles that congregate on neem leaves on the night of emergence immediately after first showers during May-June reduces beetles population progressively over a few years. Since the beetles are not attracted to light actively, the neem trees should be shaken vigorously to dislodge the beetles, which will then be attracted to light sources such as jeep or tractor head lights. The beetles thus collected can be immersed in insecticidal solution & killed. The collection may be continued for a week.
- Small neem trees may be sprayed with chlorpyrifos 20EC @2ml/litre of water immediately after the first summer rain to kill the adult beetles that congregate on these trees the following day. Alternatively, big branches of the neem trees sprayed

with insecticides may be planted in the fields to attract and kill the adult beetles.

- Sprayed trees should be labelled in local language cautioning not to use floral parts or leaves.
- Spot application of phorate 10G @200 g/cent (20 kg/acre) mixed with 1 kg of sand in the affected area and also surrounding area with healthy plants. Irrigation should be done immediately for dissolving the granules. The treatment has to be repeated after 20 days for better control. Spot drenching of chlorpyrifos 20 EC @ 2 ml/litre in the affected clumps and also nearby surrounding healthy clumps @ 5 litres of insecticide solution per clump under severe incidence.
- Repeat deep ploughing at the time of land preparation to expose quiescent adults for desiccation & vertebrate predation.
- Ploughing and flooding the field near neem trees will bring grubs to the surface which can be collected & destroyed.
- Under severe infestation, puddling & rotation with paddy reduces grub population.
- The fungus, *Beauveria brongniartii* and *Metarhizium anisopliae* formulated with carrier materials such as press mud, lignite or talc may be applied at 2.9×10^{12} spores/ha during June-July coinciding with emergence and oviposition activity of beetles to target young stages of grub. The formulation may be mixed with suitable quantity of FYM or well cured press mud & distributed in the furrows, followed by irrigation of the crop. Repeated application over a few years may be needed to build up the inoculum of the fungus in the soil to enable it to act as a self perpetuating mortality factor.

Management of early shoot borer

Cultural: Early season planting (Dec-Jan)

Trash mulching on ridges on 3DAP

Intercropping with green gram, black gram, daincha effectively checks shoot borer.

Installation of early shoot borer sex pheromone traps @ 20/ha for monitoring of pest density

Spray Granulosis virus at 1.5×10^{12} PIB/ha twice on 35 and 50 days after planting (DAP) or release 125 gravid females of *Sturmiopsis inferens* /ha on 30 and 45 DAP

Apply any one of the following insecticides:

Soil application

Carbofuran 3 G 33 kg/ha.

Chlorpyrifos 10 G 12.5 Kg/ha

Spraying

Chlorpyrifos 20 EC 1000 ml

Phosalone 35 EC 1000 ml

NSKE 5 % 25 Kg/ha

Scale insect, *Melanaspis glomerata*

- Select scale insect free setts
- 2. Bunds free from weeds
- Avoid repeated ratoons
- Detrash the crop at 5th and 7th month after planting
- Drain excess water
- Avoid water stagnation
- Presoak the setts in 0.1% malathion solution
- 8. Spray of the following insecticides (120/150 day after detrashing)
- Dimethoate 30 EC @ 2ml/lit of water

Microbial methods for stubble decomposition –Madurai

TNAU biomineralizer is the consortium of microorganism recommended for composting sugarcane stubble. For one ton of trash, two kg inoculums are recommended. Without the inoculation of microbial consortium, the composting process will take its own time. The alternative source required microorganism for composting is cow dung slurry. But in the cow dung slurry the required population of microorganism for composting is low and they have to compete with other microorganisms present in the cow dung for survival. In TNAU biomineralizer, only the required microorganism meant for composting alone is present with high population. Therefore it is recommended to go for TNAU biomineralizer.

Management practices for Mite – Madurai

- Avoid excessive use of nitrogenous fertilizers
- Drain excess water.
- Detrash the crop at 5th and 7th month after planting.
- Removal of affected leaves and burning them.
- Spot application of dicofol @ 2.5 ml/litre or wettable sulphur @ 6.5 gms/ litre.

To standardise the correct spacing to get higher yield - Villupuram

In conventional method 80 cm spacing is followed.

Normally 150 X 30 cm spacing is followed under subsurface drip fertigation system.

Control measures or repellent to control the Wild Boar menace as well as forest animals – Villupuram

A repellent for the wild boar has been developed at ARS, Virunjiapuram. The product is under field evaluation.

Suitable technology to maintain higher yield in Sugarcane with sub-surface irrigation –

Sivaganga

- Trenches of 30 cm depth, 40 cm width at 180 cm spacing formation
- Planting of two budded setts @ 8 setts / m on either side of the furrow.
- Laying the inline laterals with a emitter spacing of 60 cm with 4 LPH
- Drippers to a depth of 20-25 cm just below the setts and the drippers must face upwards.
- Irrigating the crop at 100% PE on alternate days for light soils and once in 3 days for heavy soils.
- Recommended N & K @ of 300 and 200 kg. ha⁻¹ may be applied in 14 equal splits with 15 days interval from 15 DAP. 25 kg N and 8 kg K₂O per ha per split. Urea and MOP (white potash) fertilisers can be used as N and K sources respectively.
- Fertigation up to 210 DAP can also be recommended
- 100 kg P₂O₅ is applied as basal.
- Spacing :150x30 cm
- Harvest at 10-11 months with cane harvester.

In Nagapattinam District drip irrigation in sugarcane is a failure. While instaling drip in sugarcane blocking in tubes due to high Iron content in Irrigation water. So Suggest suitable solution for this problem – Nagapattinam

- The recommended treatment to remove iron is oxidation, sedimentation and then filtration. Procedures used include aeration and settling ,chlorination and use of potassium permanganate
- Iron is more soluble at lower pH values, the best precipitation is likely to occur at a pH of 7.2. You can add hydrated lime, that is, calcium hydroxide Ca (OH)₂, to raise the pH values. Rates of 30 grams per 1000 litres of water are often used.
- Inject chlorine at a concentration of 0.64 times the ferrous or soluble iron concentration in order to maintain 1 ppm of free residual chlorine at the end of the drip line. Chlorine oxidizes the iron at a lower pH than does aeration. For practical purposes, however, a pH of about 6.5 to 7.5 is recommended for chlorine oxidation.
- Inject chlorine at a concentration of 1.3 times the soluble manganese concentration. The pH must be at least 9.5 for any appreciable oxidation to occur.
- After you inject chlorine to cause iron precipitation, discharge the water into a reservoir where the iron can settle out or use a sand media filter to remove the precipitated iron.

Suitable Weed Management technique for ratoon Sugarcane is required – Ariyalur

- Mertibuzin (Sencor 70% WP) @ 0.7 to 1.4 kg a.e /ha. Post emergence application of 2,4-D @ 1.5 kg a.e/ha about one month after rationing or about 45 to 50 days after planting depending upon weed intensity and weed growth.
- For control of nutsedge and hariali in sugarcane use Glyphosate @ 2 to 2.5 kg a.i /ha

as post emergence directed spray when the weeds are green and succulent. Apply the herbicides on weeds only and should not fall on the crop.

High tillering, Non.-lodging with more girth and non flowering sugarcane variety has to be evolved – Thiruvannamalai

C 28169 - Pre-release variety developed by SRS, Cuddalore.

Mechanical sett planter with uniform depth – Trichy

Mechanical sett planter with uniform depth is already in use

- Planting of sugarcanes in two rows.
- Opening of furrows at a spacing of 75 cm.
- Cutting of cane into 37 cm. long setts
- Placement of setts in the furrows
- Dropping of fertilizer below the setts
- Dispensing the insecticide solution over the setts

Covering the setts with soil and providing light compaction to minimise sett and soil moisture loss

Advantages:

Irrigation water saving:20- 30%

Seed Saving:40%

Fertilizer Saving:40%

Full yield of Wheat and sugarcane is obtained.

The cost of operation per ha in case of this equipment will be in the range of Rs. 2000 as compared to Rs. 7000 manually. Machine costs approximately Rs.85,000

Mechanical detrashing machine is needed – Trichy

Mechanical detrashing machine is also available. The cost of the unit is Rs. 100/-

- Labour requirement is less
- Easy for handling
- Reduced cost of de-trashing
- Used for all varieties of cane
- Also removes the sprouted buds
- Easy collection of de-trashed leaves

Drought tolerant varieties are required – Trichy / Vellore

TNAU sugarcane Si 7, CoG 95076 and C 28169 - Pre-release variety developed by SRS, Cuddalore.

Shoot borer tolerant Varieties are required – Trichy

CoC(SC)24 is tolerant to Early shoot borer.

Best alternative for COC 86032 needed – Erode
High yielding varieties with high sugar content – Coimbatore

Co 0212 – New variety released by Sugarcane Breeding Institute, Coimbatore
 C 29442 - Pre-release variety developed by SRS, Cuddalore are high yielding varieties.
 TNAU Sugarcane Si7- cane yield 154t/ha, CCS-13.05 % and TNAU Sugarcane Si8- cane yield 146t/ha, CCS-12.9%.

Integrated weed management strategies for *Striga* management – Dharmapuri
Management practices for *Striga* – Madurai

Pre-emergence application of atrazine 1.0kg/ha on third day after planting + hand weeding on 45 DAP with an earthing up on 60 DAP combined with post-emergence spraying of 2,4-D sodium salt 5g/litre (0.5%) + urea 20g / litre (2%) on 90 DAP.

Management technologies to overcome the Pest incident White grub, Stem borer, Scales insect problem – Perambalur

White grub: Two to three extra ploughing to expose white grubs for predation in endemic areas. Foliar Spray carbaryl 50 % WP @20ml/lit at the sun
 Stem borer: Trichogramma chilonis at the rate of 2.5 cc / release / ha. Six release at fortnightly intervals starting from 4th month onwards.

Farm mechanization needed for easy crop production - Coimbatore

Farm mechanization is done with the help of following machineries

1. Elimination of Old Cane Stubbles- five passes of light and heavy disc harrows with a 55 HP tractor
2. Land Preparation: - Nine tyne spring loaded cultivator mould board plough, disc plough, heavy disc harrow, duck foot tillers, rotavators, blade tracers, land planer, bund former, trencher, ridger, furrower and other local tillage tools
3. Interculture Operation:
 - i) Earthing Up: Bund former
 - ii) Weeding: Animal or tractor operated junior hoe or cultivators. Use of self propelled rotary weeder and lightweight power tillers, tractor tillers
4. Irrigation: Through surface and sub surface drip fertigation.
5. Ratoon Management: Trash shredders was introduced to powder the trash. It paved a way for in situ trash mulching. Use of stubble shaver, with attachment for off baring stubble shaving is done
6. Cane Harvesting: Mechanical harvesting with combined harvester 8000/4000 series.

Microbial methods for stubble decomposition

Biomineralizer (microbial consortia) has already been developed for organic waste decomposition. For in situ decomposition, the following method is recommended:

- Wetting the trash in the field.
- Spraying of urea (5 Kg in 20 lit of water per acre).
- Spraying of Biomineralizer (10 kg in 400 lit of water per acre)
- To hasten the decomposition process, the trash may be mixed with soil by ploughing.
- For composting one tonne of trash or crop residue, 2 kg of Biomineralizer is recommended.

COCONUT

Slug Caterpillar is a serious menace in Coconut gardens during summer months. The damage is very fast. Farmers find it very difficult to spray the pesticides on trees as the person who applies the insecticides experience high irritation in the skin due to the excretal droppings from the insects on the trees. Hence Suitable biological Control measures by the release of predators may be suggested to control the insect-Kanyakumari

As on now, the slug epidemic could be managed with the recommended insecticides. However there are ways and means to avoid the occupational exposure to the personnel involved in pesticide application by means using protective cloths, goggles, masks etc available commonly. TNAU can demonstrate the use of these protective measures on need basis. The predator, *Eocanthecona furcellata* though could take of the care of pest in natural condition, the efficiency may not keep pace during the epidemic situation. Hence, conserving the predator is also an important aspect by duly avoiding indiscriminate use of insecticides particularly pyrethroids.

EVOLVING BIO CONTROL AGENTS FOR BLACK HEADED CATER PILLAR-Black Headed Caterpillar (BHC)menace is higher during summer and drought season. Parasites are being released to control the pest besides root feeding of insecticides. Bio-control agents may be evolved to control the pest effectively and eco-friendly as a IPM Package – Namakkal

Evolved technology for the management of BHC is effective in managing the pest especially with *Bracon brevicornis* @ 30 /palm and *Goniozus nephantidis* @ 20 /palm four to five times at 21 day intervals.

Plant protection measures required for controlling black headed caterpillars (BHC) in coconut. (the pest could not be controlled adopting the chemical and biological methods prescribed at present) – Krishnagiri

BHC could be effectively managed with the parasitoids indicated above as experienced during 2015-16 when as much as 4.5 lakh parasitoids were distributed to farmers of Annur and Krishnagiri and got positive feedback. The pest could be managed only when the parasitoids are applied at the right stage. Hence, farmers shall be advised accordingly.

In coconut, concrete plant protection measures for the control of Eriophyid mite may be suggested – Vellore

Already proven methods for the management of eriophyid is reported to be effective as per feedback from adopted farmers. Hence use of nutritional management with urea 1.3 kg + super phosphate 2.0kg + potash 3.5 kg + 500 g Magnesium sulphate + boron 100 g+ FYM 50kg+ neem cake 5 kg - applying in two splits take care of the plant health besides offering resistance to the eriophyid mites. Inclusion of green manure crops viz., sunnhemp and mucuna around the basins and incorporating at 50% flowering stage improves soil health. In addition to INM, azadirachtin 1% 10 ml + 10 ml water as root feeding thrice in a year during non rainy period.

Parasitoids are effective in control of coconut black headed caterpillar and the availability at the time of requirement usually during summer season is a constraint – Tirupur

Availability of the parasitoid is not a constraint as necessary measures have been taken by TNAU to train the entrepreneurs to set biocontrol laboratories to mass multiply parasitoids. Need based training was given for two batches during February and June 2016. Farmers also get the parasitoids from TNAU Research Stations.

Coconut eriophid mite - Organic method of controlling this pest is needed – Kancheepuram

Inclusion of green manure crops viz., sunnhemp and mucuna around the basins and incorporating at 50% flowering stage improves soil health. In addition to INM, azadirachtin 1% 10 ml + 10 ml water as root feeding thrice in a year during non rainy period.

BANANA

In the month of Oct due to heavy rains and winds causes 4000 to 5000 ha. Of damage in banana crop. Solution is requested for this problem – Cuddalore

- Wind damage can be overcome by adjusting the planting time. Bearing should not be coincided with the windy season

- August planting can be recommended
- Sturdy varieties like Karpooravalli can be grown
- Avoid growing banana in wind prone and flood prone areas.

Bacterial and fungal wilt complex – Dharmapuri

- No bacterial and fungal wilt complex in banana. The fungal wilt is caused by *Fusarium oxysporum* f.sp. *cubense* and bacterial wilt is caused by *Burkholderia solonacearum*.

Fungal Wilt:

- Uproot and destroy severely affected plants. Apply lime at 1 – 2 kg in the pits after removal of the affected plants.

Corm injection:

- Remove a small portion of soil to expose the upper portion of the corm. Make an oblique hole at 45° angle to a depth of 10 cm. Immediately insert a gelatin capsule containing 60 mg of Carbendazim or of 50 mg of *Pseudomonas fluorescens* or inject 3 ml of 2% Carbendazim solution into the hole with the help of 'corm injector' on 2nd, 4th and 6th month after planting.
- Apply press mud at 5 kg per tree to reduce the wilt incidence (or) apply *Pseudomonas fluorescens* (Pf1) liquid formulation @ 4 lit / ha at 2nd, 4th and 6th MAP through drip system to manage panama wilt and nematode complex.

Bacterial wilt Management

- Early detection and destruction of the suspected plants may help in preventing the spread of the disease. All the tools used for pruning and cutting should be disinfected with formaldehyde. As the insects can carry the disease causing bacterium on the male flowers, removal of the male flowers as soon as the last female hand emerge help in minimising the spread of the disease. Bunch covering.
- Fumigate with methyl bromide Herbicides like 2,4 D can be used to kill the infected plants

Manure and Manuring of Red Banana: Application of heavy dose of both organic and inorganic fertilizer for Red Banana is under practice which brings down the profit. The recommended dose of fertilizer for garden land other than nendran variety of banana as per the crop production manual was applied resulted in low quality of bunches when compared to the traditional applications. Hence it is requested for a special study to recommend the optimal dose of fertilizer for red banana variety in Kanniyakumari District is requested – Kanyakumari

- In high rainfall zones like Kanyakumari, leaching losses will be heavy.
- In soils high in organic N, and low in potassium, the uptake of nutrients will be improper

- In Red banana grown under partial shade, the bunch development is reduced.
- The problem is known as “Summer syndrome”. This is the result of high salt accumulation in soil due to increased evapo- transpiration in summer
- A rain after summer will set right this problem or sufficient irrigation can be given to overcome this problem

Abnormal marginal drying of leaf in banana: In some part of the district during summer an abnormal marginal drying of leaves which resembles potash deficiency is noticed. Even after foliar application of Potash the crop didn't recovered. The problem may be studied and suitable recommendations may be offered to manage this problem – Kanyakumari

The marginal drying may be due to salt injury either from soil or irrigation water. This may be checked.

Permanent Staking Technology to protect the Banana crop from flood damage that occurs regularly in Nagapattinam district. – Nagapattinam

Avoid growing banana in low lying delta zone. In high level area, grow hardy and wilt tolerant varieties like Poovan.

Suggestion is needed to which the varieties suitable for Hi-Density Planting.

Good agricultural practices for TC Banana cultivation

Ripening & Packaging Technology to export market - Namakkal

For cultivars viz., Grand Naine, Poovan and Nendran high-density planting systems have been standardized GAP for banana is attached.

Suitable Erwinia wilt control measures in Banana may be suggested – Salem

Erwinia management in banana

- Removal and destruction of infected plants
- Dip suckers in Copper oxy chloride (40 g/10lit) + Streptocycline (3g/ 10 lit.) for 30 min. before planting.
- Application of bleaching powder @6 g /plant followed by immediate irrigation at the onset of disease.
- Soil drenching with streptocycline 1-2 litres / plant (500ppm) at 1st MAP+ *Trichoderma viride* (50g/plant at 2nd,4th MAP)+ growing sunhemp in the interspaces up to 4 MAP.

Banana – Poovan variety – productivity improvement

a) Package of practices of Poovan variety

In Thoothukudi District Poovan variety of Banana is cultivated more than 1000Ha in the wet Lands of Tamirabarani river basin. The common practice is allowing more than ten ratoons with least care, which results in very low productivity. Hence study to recommend package of practices to improve the production of Poovan variety ratoon crops in Thoothukudi District – Thoothukudi

- The fertilizer dose as recommended for the main crop can be applied to the ratoon also
- Control measures for the nematodes should be strictly followed for ratoon also.

b) Package of practices of Leaf Banana cultivation

Banana cultivation of leafs is common practice in Srivaikundam, Allwarthirunagari in Thiruchendur Block of Thoothukudi District. There is no scientific cultivation practice for this cultivation. Hence study to recommend suitable packages of practices of leaf Banana cultivation in Thoothukudi District – Thoothukudi

- At the time of planting 10 kg of farm yard manure is applied in each pit.
- Optimum dose of fertilizers for leaf production is 113:113:339 g/plant which enhanced the number of leaves per plant.
- Thereafter fertilizers are applied once in two months till the leaf harvest is over.
- Efforts will be taken to undertake a study for formulating suitable packages for leaf banana cultivation.

Weevil incidence, Curling of new leaves and drying of leaves - Tirupur

- Remove dried leaves periodically and keep the plantation clean.
- Prune the suckers every month.
- Do not dump infected materials in the manure pit. Infected trees should be uprooted, chopped into pieces and burnt.
- Spray monocrotophos 36 WSC @ 1 ml/l of water.
- Alternatively, dilute 54 ml of monocrotophos 36 WSC with 350 ml of water and inject 4 ml (2 ml at 45 cm from the ground level and another 2 ml at 150 cm from the ground level) in the pseudostem at monthly interval from 5th to 8th month.

Pseudostem weevil management – Tirupur

- Remove dried leaves periodically and keep the plantation clean.
- Prune the suckers every month.
- Do not dump infected materials in the manure pit. Infected trees should be uprooted, chopped into pieces and burnt.

- Spray monocrotophos 36 WSC @ 1 ml/l of water.
- Alternatively, dilute 54 ml of monocrotophos 36 WSC with 350 ml of water and inject 4 ml (2 ml at 45 cm from the ground level and another 2 ml at 150 cm from the ground level) in the pseudostem at monthly interval from 5th to 8th month.

GUAVA

In guava after pruning in Sept. & Feb. little leaf disease is observed at the time of flowering and fruiting season. This leads to reduction in yield. Solution is requested for this problem – Cuddalore

- Little leaf diseases is not observed usually in guava. Recommended dose of manures and fertilizers may be applied.

Following micro nutrient mixture may be sprayed.

- Zn So₄ – 0.50%
- Mg So₄ - 0.50 %
- Mn So₄ – 0.50%
- Cu So₄ – 0.25%
- Fe So₄ – 0.25%

Stages

- During new flush emergence
- During flowering
- One month after flowering
- During fruit set

Need Biocontrol measure to control mealy bug – Vellore

- Release 100 numbers of encyrtid parasitoid *Acerophagus papayae* for a small hamlet or village area of 8-10 ha. Conserve the lycaenid predator.
- Dissolve fish oil rosin soap @ 25 g/l, initially in luke warm water, then in required quantity of spray fluid in the sprayer.
- Release Australian ladybird beetle, *Cryptolaemus montrouzieri* @ 10 beetles/tree or 1500/ha
- Band the trees with 20 cm wide 400 gauge polythene sheets
- Follow ant control methods such as destruction of ant holes, red ant nests and skirting of trees after fruit harvest which prevents the ant migration through side branches.
- Spray chlorpyrifos 20 EC @ 2.5 ml/l or dimethoate EC 1.6 ml/l

BRINJAL

In PLR-1 Brinjal Variety the incidence's of pest and diseases are more in ChittraiPattam. Hence, alternate variety may be evolved – Cuddalore

- The variety PLR-2 is released to replace the PLR-1 brinjal. This variety is being cultivated in a larger extent which is also popular among the farmers.
- Pest and disease incidence is comparatively less in PLR-2. Hence, PLR-2 may be recommended for Chitiraipattam. PLR-2 brinjal seeds are being produced and distributed by VRS, PLR during 2015-16.

Brinjal is cultivated in some parts of Namakkal District. In Brinjal compatible rootstock for both *invitro* and *invivo* Technology is needed - Namakkal

Solanum torvum was identified as suitable rootstock for brinjal grafting and the brinjal grafting technology was developed and released in 2016.

TOMATO

Leaf curl and Spotted wilt virus complex resistant variety, Post harvest technologies may be standardized and processing unit may be started by government – Dharmapuri

- Development of hybrid with leaf curl and spotted wilt virus resistance in tomato is in progress at the Dept. of Vegetable Crops, Coimbatore
- Standard post harvest technology protocol for tomato is available. Suitable proposal may be prepared by the concerned Deputy Director of Horticulture and submitted to government for establishing processing unit.

TURMERIC

Rhizome rot and Post Harvest Management Practices, Varieties with high curcumin content needed and Mechanization in harvesting – Dharmapuri

- **Rhizome rot**

- Seed rhizome treatment: Soak the rhizomes in COC @ 2.5 g/lit for 30 min.
- Fields should be drenched with Mancozeb (0.3 %)

- **Post Harvest Management**

Improved Turmeric Boiler - TNAU Model

- Capacity of the unit is 5 tonnes per day.
- The cost of boiling of turmeric rhizomes is Rs. 10 per quintal.
- Savings in time - 65 minutes
- Savings in fuel - 30 %

- **Varieties with high curcumin content**

- Turmeric variety CO 2 was released during 2013, having high curcumin content of 4.3%
- Acc. 48 (IISR), a high yielding, high curcumin (5%) and nematode tolerant genotype was evaluated in multilocal trials in Erode, Tamil Nadu during 2013-16. The genotype performed well under Tamil Nadu conditions and will be released during this year.

- **Mechanization in harvesting**

- TNAU developed two turmeric harvester
- (1) Power tiller drawn turmeric harvester
- (2) Tractor drawn turmeric harvester
 - 26 % saving in cost
 - Harvesting efficiency was 99 per cent
 - < 1% damage to the rhizome

**Economic and advanced curing methodology in Turmeric processing.
Value addition and export opportunities in Turmeric - Namakkal**

- **Economic and advanced curing methodology in Turmeric processing**

(1) Improved Turmeric Boiler - TNAU Model

- Capacity of the unit is 5 tonnes per day.
- The cost of boiling of turmeric rhizomes is Rs. 10 per quintal.
- Savings in time - 65 minutes
- Savings in fuel - 30 %

(2) CSIR-Central Food Technological Research Institute (CFTRI), Mysore, has developed a cost and time-saving technology for processing of turmeric which can be adopted.

- **Value added products from Turmeric**

- **Turmeric Powder:** Dried turmeric is powdered to a fine mesh-60 (250 microns) to be used in various end products.
- **Turmeric oil:** Dried rhizomes and leaves are used industrially to extract the volatile oil. Dried rhizomes contain 5-6% and leaves contain about 1-1.5 % oil.
- **Turmeric Oleoresin:** Turmeric rhizomes contain about 7-14 per cent oleoresin. The major compound in oleoresin is the colouring principle curcumin. It is used in food preparation and pharmaceutical products.
- **Curcumin:** The curcumin content in turmeric varieties vary from 3-9 per cent. It is preferred in the food and pharmaceutical industry as a natural colourant.

- **Export opportunities in turmeric**

East Asia and Middle East together shared more than 50% of the total quantity exported from India. America, Sri Lanka, Bangladesh and Europe are the other countries to where the Indian turmeric was exported.

Resistant variety for Turmeric rhizome rot may be released - Salem

TNAU released a variety CO 2 showed highly resistant to rhizome rot.

Micro nutrient deficiencies – Tirupur

- IISR has developed crop/soil specific micronutrient mixtures for foliar application in black pepper, cardamom, ginger, and turmeric crops which guarantees 15 to 25 per cent increase in yield and quality. An innate advantage of these mixtures is that they can also be used in organic agriculture and therefore are environment friendly.
- For ginger and turmeric foliar spray at 5 gm per litre of water once during 60 days after planting and another 90 days after planting are recommended.

Need Biocontrol measure to control rhizome rot - canker – Vellore

Biocontrol methods

- Seed rhizomes can be dipped in solution containing 1 kg of *T. viride* or 1 kg of *P. fluorescens* in 100 litres of water for 30 minutes before sowing
- Before planting, apply 2.5 kg of *T. viride* or 2.5 kg of *P. fluorescens* mixed with 100 kg of well decomposed farm yard manure in soil in the ridges.

TAPIOCA

Crop based Micro Nutrient mixture, Drought tolerant and mosaic virus resistant variety needed – Dharmapuri

The work on standardization of micronutrient requirement is in progress at TCRS, Yethapur. The results will be made available after completion of the study.

Development of drought tolerant and mosaic resistant cassava varieties are in progress at TCRS, Yethapur.

Suitable variety may be recommended with high starch content combined with drought tolerant nature for Namakkal District. - Namakkal

For plains, the high tuber yielding and starch content varieties with drought tolerant are H 226, Yethapur 1 and Sree Athulya. Besides H 165 is recommended for hilly regions of Namakkal district (Kolli hills).

Tapioca cultivated in about 15000 ha in Salem dt. To overcome micro nutrient deficiency suitable Tapioca booster may be introduced and supplied by TNAU – Salem

Micronutrient deficiency is observed mainly in all the tapioca growing regions of Tamil Nadu and more specially in calcareous soils. This problem can be managed by the foliar

spray of 1% FeSO₄ + 0.5% ZnSO₄ at 60th and 90th DAP. In addition to the above, the development of micronutrient mixture/booster for tapioca is in progress.

JASMINE

Recurring mite problem – Dharmapuri

Management of Jasmine eriophyid mite and red spider mite

Spraying of dicofol 18.5 EC 3ml/l or wettable sulphur 50WP 5g/l or propargite 57 % EC @ 2ml/l or fenazaquin 10 % EC @ 2 ml/l.

Thovalai Vellai :

Thovalai Vellai is a local Jasmine variety which is hardy and high yielding apart from local preference of flowers. A study of this local type under crop improvement programme is requested – Kanyakumari

High yielding *Jasminum grandiflorum* (Thovalai Vellai) is maintained at Floriculture Research station, Thovalai. This type will be further evaluated for assessing its suitability and yield potential. Simultaneously this type will be sent to Dept. of floriculture and Landscaping, HC&RI, Coimbatore for further evaluation with the existing cultivars.

MANGO

Inducing off season bearing and technology to regulate regular bearing in biennial bearing variety – Dharmapuri

I. Inducing off season bearing

- Pruning back the flowering shoots to 10cm below the panicle (after harvest).
- Spraying GA₃ 100 ppm thrice (during August, October and December) and treating with paclobutrazol at 5 ml / tree during following April or pruning back the flowering shoots to 10 cm below the panicle (after harvest), spraying GA₃ 100 ppm twice (during August and again during October) and treating with paclobutrazol at 5ml / tree during following April was relatively more effective in inducing off-season flowering and more percentage of off – season flowering and more percentage of off-season fruiting with better quality.
- The initial encouragement of vegetative growth from August to December by the application of GA₃ (delaying the expected fruit initiation and differentiation phase which normally coincides with October / November months under South Indian conditions), then checking its growth by paclobutrozol during April would be the real cause for the shift in more percentage of off-season cropping.
- Adding to that, foliar application of 1.0% KH₂PO₄ and 1% KNO₃ at bud break stage increased the percentage of hermaphrodite flowers, number of fruits and

fruit set per tree and thereby increase the yield and also improve the quality parameters like TSS, reducing, non-reducing and total sugars.

Fruit Malformation in Mango – Dindigul

The symptoms of the malformation first appear on leaves,

- As soon as the disease appears, the affected terminals along with the basal 15-20 cm healthy portion should be removed or pruned and burnt.
- If more than 25 per cent trees are affected, spraying of Planofix (200 ppm) during the first week of October followed by deblossoming at bud burst stage is recommended.
- Single foliar application of 1,000 ppm cobalt sulphate prior to flower bud differentiation successfully reduce the floral malformation. (Courtesy: CISH, Lucknow).

Pruning for Off Season Mango :

The recommended period of pruning during August is coinciding with flowering in off-season varieties in Kanniyakumari District. Hence, a suitable period of pruning may be recommended to enhance the yield in off-season varieties – Kanyakumari

The recommended period of pruning during August is only for main season crop (April to May). If the farmer is interested in off season mango, he need not take up pruning in August.

PAPAYA

Root rot, Mosaic virus and Mealy bug management – Dharmapuri

Root rot

- Seed treatment with Thiram or Captan 4 g/kg or Chlorothalonil.
- Soil Drenching with Copper oxychloride 0.25 % or Bordeaux mixture 1% or Metalaxyl 0.1%.

Mosaic virus

- Raising healthy papaya seedlings in insect proof net house.
- Spraying Acephate (1.5 g/lit) 15 days before planting.
- Raising two rows of Maize as border crop one month prior to planting
- Placing yellow sticky traps (5 nos. /acre) swabbed with grease or castor oil to attract the aphids
- Spraying Neem oil 1% or Acephate 1.5g/lit or Dimethoate @1.5 ml / lit or Imidacloprid 0.075% up to 4 months of planting
- Spraying Boron 0.1% and Zinc Sulphate 0.5 % in 3rd and 7th month to sustain yield of infected plants.

Mealy bug management

- Release of 100 numbers of papaya mealy bug parasitoid, *Acerophagus papayae* for a small hamlet of 8 - 10 ha and conservation of lycaenid predator, *Spalgis epius*.
- Release of Australian ladybird beetle, *Cryptolaemus montrouzieri* @ 10 beetles/tree or 1500/ha.

TUBEROSE

Nematode resistant variety required and need Co-operative flower auction center – Dharmapuri

- The IIHR Released varieties, **Arka Niranthra** and **Shringar** are tolerant to nematode.
- The farmer may be advised to take up the following management practices for nematodes
 - Furadon (3G) application @ 33 kg/ha
 - Application of biopesticide enriched FYM/ vermicompost + neem cake at 2.5 to 5 tons/ha.
 - For enrichment, biopesticides as 2 kg Trichoderma + 2 kg Pseudomonas + 2 kg Pochonia /*Paecilomyces lilacinus* should be mixed with 1 ton of FYM/ vermicompost and kept under shade with 20 - 30% moisture and after 15 days, it can be applied to fields.
 - As rotational crop, marigold may be suggested.
- For setting up of Co-operative flower Auction centre - Necessary action will be taken after discussion with Directorate of Horticulture and Plantation Crops, Tamil Nadu.

BHENDI

Yellow vein mosaic virus variety required – Dharmapuri, Madurai, Thanjavur

High yielding and YVMV resistant bhendi hybrid CO 4 was released during the year 2016. This hybrid is recommended for cultivation throughout Tamil Nadu.

WATERMELON

Requirement of improved and high yielding varieties – Dharmapuri

Suitable research proposal will be taken up to develop variety and hybrids in watermelon suited to Tamil Nadu cultivation at VRS, Palur.

ARECANUT

Management practices for Button shedding problem – Dharmapuri

CPCRI, Kasargod reported that the button shedding was caused by several factors including the fungus, *Colletotrichum gloeosporioides*.

Symptoms

- The symptom appears as yellowing and drying of rachis from the tip towards the base followed by shedding of female flowers .

Control measures

- Spray Dithane M 45 (@ 3g/l) on opening of female flowers in most of the inflorescences. This should be followed by a second spray after 25 days.
- Remove the fully affected inflorescences and destroy them by burning to prevent the spread and severity of the disease.

POLY GREEN HOUSE

Crop based fertigation schedule – Dharmapuri

Fertigation schedule developed for precision farming of vegetables holds good for protected cultivation of vegetables.

POLYHOUSE CULTIVATION

Suitable crops for polyhouse cultivation other than cucumber in plains – Dindigul

Tomato and capsicum are also suitable for cultivation under plains in climate controlled green house.

Suitable crops and package of practices – Madurai

Suitable crops for polyhouse cultivation are tomato, capsicum and cucumber. Package of practices for poly house cultivation of these crops are available.

SHADE NET CULTIVATION

Suitable crops for shade net cultivation other than protrait seedlings production in plains – Dindigul

Tomato, brinjal, bhendi, gherkin, cherry tomato and leafy vegetables such as amaranthus, palak, coriander are suitable for cultivation under shadenet house (35%).

Crop recommendations according to climatic condition, Package of Practices – Madurai

Recommended crops for shade net cultivation for Madurai dts. are tomato, brinjal, bhendi and leafy vegetables such as amaranthus, palak, coriander. Package of practices are available.

POLYHOUSE AND SHADENET CULTIVATION

How to avoid wind damage of polyhouse and shadenet construction areas – Dindigul

Orientation of greenhouse should be as per the recommendation. Proper strength of material needs to be ensured. Construction should be done by experienced person. Proper wind breaking system needs to be provided. Wind prone area should be avoided for construction of green houses.

HIGH DENSITY AND ULTRA HIGH DENSITY MANGO AND GUAVA

Nutrient and water management Pruning Techniques – Dindigul

High Density Planting Mango :

Spacing - 5 m x 5 m (400 plants / ha)

Nutrients - 1.0 : 0.5 : 1.0 kg of NPK / bearing tree / year under HDP through drip fertigation adopting the fertigation schedule at weekly intervals. Irrigation and fertigation should be avoided for 30 days for induction of stress before flowering season; resume as soon as flowering commences.

Ultra high density planting in mango:

Spacing – 3 m x 2 m (1667 plants / ha)

Nutrients – 120 : 75 : 100 g NPK / tree / year.

Irrigation – 24 litres / plant / day.

Canopy management

Light pruning (removal of 30 per cent growth of the past season) in a year followed by 50 per cent removal of past year's growth and tipping in the next year .

At present HDP and UHDP is not standardized. However, the technology has been standardized at CISH, Lucknow which can be adopted to guava.

High density planting in guava:

- Planted at 3 x 6m (555 plants/hectare) provides cent per cent higher planting density over 6 x 6m spacing (277 plants/hectare)
- Higher fruit yield (159.4/tree) in 3 x 3m planting system over 6 x 6m (124kg/tree)

was observed in 8 year old trees

- Recommended planting density under conventional system is 277 plants per hectare (6 x 6m)
- Bearing habit is on current season's growth; responds well to training and pruning ; canopy engineering is feasible
- HDP together with canopy management provided 47.1 tonnes per hectare yield, 65.2 per cent increase over the recommended spacing
- Allahabad Safeda and Lalit perform well under HDP

Ultra high density planting in guava:

- A 'Meadow Orchard' system; very high productivity with superior fruit quality
- Plants spaced at 1 x 2m accommodate 5000 plants per hectare; canopy management through topping and hedging
- Plants are topped 2 months of planting in October for emergence of new shoots below cut end
- 50 per cent length of each new shoots , pruned again in December-January for induction of more shoots ; flower buds differentiate; well spread is attained by May
- Heading back of all shoots is repeated annually in September, May and January; ensures dwarf, compact canopy, better fruiting and easy horticultural operations
- Production starts from very first year of planting, 12.5 tonnes reaching up to 55 tonnes per hectare
- Lalit performs very well.

MORINGA

Off season moringa pod and leaf production techniques – Dindigul

Standardization of offseason production of moringa pod is in progress at HC & RI, Periyakulam.

Moringa leaf can be harvested throughout the year.

Fruitfly – Tirupur

Soil application of Thiamethoxam 25 WG @ 200g a.i. / ha on 150, 180 and 210 days after planting

Placement of fermented tomato fruit trap @ 25 / ha

Need based foliar spray of spinosad 2.5 SC @ 1.2 ml/l followed by profenophos 50 EC @ 2.0 ml/l.

Packing techniques of fresh vegetables for retail marketing in polythenebag/ polythene bag with holes /Air tight bags

Extending keeping quality of packed fresh vegetables – Dindigul

Based on the experimental results, polythene bag with 15 to 20% ventilation is suitable for extending the keeping quality of packed fresh vegetables.

CLOVE

Clove Decline: Clove cultivated in Mahendragiri hills in Kanniyakumari District are badly affected due to typical decline symptoms which resembles like citrus decline. This problem needs immediate attention including physiological study in this area to save the clove crop in Kanniyakumari District - Kanyakumari

- It was identified that the sudden decline is induced by *Colletotrichum gleosporioides* and *Cylindro cladium*. It was also observed that the infection per cent was high in south western aspect of the hills where in high amount of mist persists.
- Control measure : Pre monsoon Spray: Bordeaux Mixture 0.5 % spray.
- Mid Monsoon : Systemic fungicide with the combination of carbendazim +mancozeb 0.2 % spray
- Post monsoon Spray: Bordeaux Mixture 0.5 % spray.

AONLA

Poor Yield Performance :

All the NA Varieties of Aonla are unproductive and the BSR – 1 takes a long period to bear are the problems of aonla cultivation in Kanniyakumari District. Many farmers uprooted their crop due to these problems. A detailed study regarding performance of aonla in Kanniyakumari District is requested – Kanyakumari

- Generally, aonla is recommended for dry and arid zone cultivation only. Since, Kanyakumari is known for high rainfall and high humidity, flowering may be delayed which reflects in the yield.
- Regarding BSR 1 variety, it is a high yielding variety which is proven over years. In Initial years, the root stocks sprouts arising below the bud union should be periodically removed. This is normally not done by the growers. At later years, it is not possible to distinguish the scion and rootstocks.

HYBRID VEGETABLE CULTIVATION IN POLY GREEN HOUSE

In Kanyakumari District Hybrid vegetables Poly Green House cultivation is under taken in 5000sq.m area. The performance of these crops are not up to the expected level. Hence study on crops suitable for protected cultivation in Kanyakumari District with package of practice for obtaining, optional yield is requested – Kanyakumari

The precision farming technologies available for vegetable crops can be adopted for cultivation of vegetables under polyhouse conditions provided the polyhouse should be climate controlled.

CARROT

Nematode & Rootrot - Dindigul – Kodaikanal Block

- Seed treatment with *Purpureocillium lilacinum* (*Paecilomyces lilacinus*) @10 g/kg seed.
- Soil application of *Purpureocillium lilacinum* (*Paecilomyces lilacinus*) @ 2.5 kg/ha in three times at monthly interval.
- Soil application of Neem cake @ 1 ton/ha.
- Drench with carbendazim @ 0.1 %
- Spot drenching of *Pseudomonas fluorescens* @ 10g/l.

GARLIC

Rubbering - Dindigul – Kodaikanal Block

- Rubbering is a physiological disorder caused by excess uptake of N supplied through urea.
- It is a common problem in lower slope area. During rainy season excess nitrogen washed away from the higher slope area and deposited in lower slope. That leads to excess vegetative growth and rubberization in garlic.
- Proper drainage facility has to be provided to restrict the entry of runoff water to garlic fields.
- Based on the soil test report, burnt ash @ 500kg/ha has to be applied at 45th day of planting to optimize the N: K ratio
- Instead of urea application of ammonium nitrate @ 75kg/ha is recommended.

AVACODA

Stem Borer - Dindigul – Kodaikanal Block

Spraying of chloripyriphos 2ml/liter (Early stage).

ORANGE

Stem Borer & Fruit Fly - Dindigul – Kodaikanal Block

Stem borer

Prune the branches containing grubs.

Plugging the fresh holes with cotton soaked in Monocrotophos solution mixed @ 5 ml/20 ml of water will also serve as control.

Fruit fly

Collection and destruction of fallen fruits has to be done. Spray Malathion 50 EC @ 1 ml/lit with 1% crude sugar (10 g/lit).

Set up Methyl eugenol 0.1% solution mixed with Malathion 50 EC 0.05% between 6 a.m. and 8 a.m.

Use polythene bags fish meal trap with 5 gm of wet fish meal + 1 ml. Dichlorvos in cotton. 50 traps are required/ha, fish meal + Dichlorvos soaked cotton are to be renewed once in 20 and 7 days respectively.

COFFEE

Berry Borer & Coffee Rust - Dindigul – Kodaikanal Block

Berry Borer

Management

Beauveria bassiana

Mix 500 ml of groundnut oil with 500 ml of any agricultural wetting agent thoroughly.

Add this suspension to 20 l of water and three bags of *Beauveria* culture the above solution mix well and strain through a muslin cloth.

Application of spore suspension on the infested coffee bushes using a backpack sprayer, targeting the berries.

After 5 days application spores germinate and kill the insect.

Coffee Rust

Spraying of Bordeaux mixture 0.5% before flowering, during rainy and after rainy seasons in the month of May, August- September and October respectively will prevent from the diseases.

Nematode management

Marigold may be planted the coffee plantations throughout the year

Wherever there is gap in plantations, cowpea can be sown and should be uprooted before flowering and destroyed, so that the nematode population adhered to root zone will be eliminated

Disease management

Biocontrol agents should be applied along with Farm yard manure

Liming can be done alternate years to maintain the pH of the soil

Area under Coffee in Yercaud is about 6500 ha. Due to poor price for Coffee. A suitable alternate cropping system may be evolved to the farmers of shervaroyan hills – Salem

As mixed plantation fruit crops like mandarin orange, litchi, avocado, pine apple, pear can be planted to get additional income

Different *sp* of fig can be introduced to get additional income

Anthurium cultivation under shade net could be done to fetch additional income

BEANS , AVACODA, CHOW-CHOW

White fly Virus Disease - Dindigul – Kodaikanal Block

Removal of infected plants

Field sanitation

Three sprays of Thiamethoxam @ 0.6 g/l + neem oil @ 2ml/l at 15 days interval

GUAVA / PAPAYA

Mealy bug control measures – Madurai

- Release 100 numbers of encyrtid parasitoid *Acerophagus papayae* for a small hamlet or village area of 8-10 ha. Conserve the lycaenid predator.
- Dissolve fish oil rosin soap @ 25 g/l, initially in luke warm water, then in required quantity of spray fluid in the sprayer.
- Release Australian ladybird beetle, *Cryptolaemus montrouzieri* @ 10 beetles/tree or 1500/ha
- Band the trees with 20 cm wide 400 gauge polythene sheets
- Follow ant control methods such as destruction of ant holes, red ant nests and skirting of trees after fruit harvest which prevents the ant migration through side branches.
- Spray chlorpyrifos 20 EC @ 2.5 ml/l or dimethoate EC 1.6 ml/l

BETEL VINE

Wilt problem control measures - Madurai

- Selection of quality planting material
- Soil application of *Trichoderma asperellum* @ 1 kg/acre along with well decomposed Farm Yard Manure @ 100 kg/acre and neem cake @ 25 kg/acre
- Dipping the cuttings in *Trichoderma asperellum* @ 5 g/litre for 10 minutes before planting
- Field sanitation and providing adequate drainage
- Drenching of Bordeaux mixture 0.25% in the month of October, November and December

Betel vine Wilt resistant variety required - Sivagangai

Betelvine varieties released from Sugarcane Research Station, Sirugamani viz., SGM1 and SGM2 are tolerant to *Phytophthora* wilt disease

ACID LIME

Dieback and canker – Madurai

Die back and canker in citrus

Immediately after pruning take up one spray of Copper oxychloride (COC) 0.3% followed by 4 sprayings with Streptocyclin 100 ppm + COC 0.3 % at monthly intervals.

GUAVA, MANGO-HDP

Suitable Package of practices for High Density planting – Madurai

High density planting in guava:

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- Higher fruit yield (159.4/tree) in 3 x 3m planting system over 6 x 6m (124kg/tree) was observed in 8 year old trees
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GUAVA-RED FLESH**Variety and Planting materials wanted – Madurai**

In guava, the following three varieties are released so far with red flesh colour

Arka Kiran

Arka Reshmi

The above two varieties are released from IIHR, Bangalore.

Lalit this is released from Central Institute for sub tropical horticulture, Lucknow.

The above institutes may be contacted for supply of planting materials.

SOIL HEALTH**Soil Based Bulk Organic Materials incorporation to enrich and increase the soil fertility – Nagapattinam**

Farm Yard Manure can be applied @ 25 tonnes / ha to increase organic matter content in the soil.

ARID ZONE CROP / NEW CROP

One or two arid zone crop / crop that can withstand dry and heavy rain under nagapattinam coastal condition may be introduced and to be established into an exportable crop – **Nagapattinam**

- Horticultural crops are cultivated in Keelayur block and Vedharanyam block in Nagapattinam district.
- Mango is the potential crop cultivated in Keelayur block. The varieties Rumani, Alphonso and Bhangnapalli are performing well in this region.
- Cashewnut is also coming up well in arid zone region of Nagapattinam district and it also with stands water stagnation.
- Vegetables like Cluster bean is cultivated as intercrop in Casuarina.
- Bhendi hybrids are grown in Vedharanyam region.

PEPPER

1. In Kollihills the unique hill station of Namakkal District has an elevation of 1200 MMSL. It's a good place for Pepper cultivation. an oncoming project " Vietnamese method of Pepper Cultivation" needs a suitable pepper cultivar which may be an ideal and specific for commercial and Training purpose.

2. Technology for improving recovery % of white Pepper from Panniyur 1 Variety which is ruling variety of Kolli Hills – Namakkal

1. In Vietnam black pepper is cultivated in open conditions in the dead standards under close planting system. This is possible because of well distributed rainfall throughout the year (bi-modal).

The following varieties may be suitable for cultivation in dead standards under open conditions. Sreekara, Subhakara, Thevam, Girimunda, Panniyur-1 and Panniyur-5. Assured irrigation through the year is required for such intensive cultivation under Tamil Nadu conditions.

2. It is generally prepared by retting (with frequently changing of water) fully ripened red berries for 7-8 days followed by removal of outer skin, washing and drying to a moisture level of 12%. The improved technology developed by IISR where White pepper is produced by fermentation (using specific bacterial cultures) using matured green pepper and black pepper.

ONION

In Namakkal District, small onion is cultivated nearly 2000 Ha. But there is a scarcity for quality seed material. So good quality seed production technology (Co-On5) is needed - Namakkal

Seed production technology for CO(On) 5 has been standardized.

Twisted Leaf Disease - Perambalur

Spraying of Propiconazole @ 0.1 % at the initiation of the disease followed by mancozeb @ 0.2 % at 10 days interval.

Fluctuations in market price and Collection centre is required – Tirupur

Commodity association is to be set to solve this issue and price forecasting is to be made for onion and Director of Agricultural marketing will be informed for setting up of collection centre for onion.

POMEGRANATE

Recommend suitable spacing and varieties for Hi-Density Planting and commercial purpose to Namakkal District.

Biological control measures needed for fruit borer - Namakkal

- In Pomegranate, varieties viz., Mirudhula, Bhagwa are recently popular in Maharashtra. For planting material, the National Research Centre for Pomegranate, Pune may be contacted. Recently, tissue culture plants are available in pomegranate which can be also used.
- Regarding spacing the recommended spacing 3m x 3m can be adopted at present.

CROP DIVERSIFICATION

Namakkal district falls in western region receiving less rainfall and causing severe water scarcity, farmers facing huge crop and income loss. Hence a suitable crop may be suggested for drought resistant to get minimum assured income by the farmers - - Namakkal

Vegetable crops : cluster beans, short duration greens, mint and coriander under shade net throughout the year

Melons under mulching sheet in alternate row planting as three crops per year

Fruit crops: Annona, pomegranate, guava, amla.

CHILLI

Presently the local MUNDU variety is exclusively grown in this district which gives only marginal yield. So to fetch higher remuneration purpose, Hybrid chilli variety with same characters of Ramnad MUNDU type may be evolved which must be suitable to this District. –Ramanadhapuram

Suitable research proposal will be formulated to develop mundu chilli variety / hybrid at CSRS, Ramnad / Dept. of Vegetable Crops, Coimbatore.

Drought Tolerant, High yielding Chillies Hybrid Seeds required – Sivagangai

Development of drought tolerant chilli hybrids and varieties are in progress at the Department of Vegetable Crops, Coimbatore.

Mites &Thrips - Tirupur

Thrips:

Grow Agathi as intercrop

Treat seeds with imidacloprid 70% WS @ 12 g /kg of seed

Spray any one of the following insecticides

Insecticide	Dose
Imidacloprid 17.8 % SL	3.0 ml/10 l
Dimethoate 30 % EC	1.0 ml/l
Emamectin benzoate 5 % SG	4 g/10 l
Ethion 50 % EC	2.0 ml/l
Fipronil 5 % SC	1.5 ml/l
Oxydemeton –Methyl 25 % EC	1.0 ml/l
Phosalone 35 % EC	2.0 ml/l
Spinosad 45 % SC	3.2 ml/10 l
Thiacloprid 21.7 % SC	6.0 ml/10 l

Yellow Muranai mite:

Spray any one of the following insecticides

Insecticide	Dose
Buprofezin 25 % SC	8.0 ml/10 l
Chlorfenapyr 10 % SC	1.5 ml/l
Diafenthiuron 50 % WP	8.0 g/10 l
Dimethoate 30 % EC	1.0 ml/l
Fenazaquin 10 % EC	2.0 ml/l
Fenpyroximate 5 % EC	1.0 ml/l
Oxydemeton –Methyl 25 % EC	2.0 ml/l
Propargite 57 % EC	2.5 ml/l
Quinalphos 25 % EC	1.5 ml/l
Spiromesifen 22.9 % SC	5.0 ml/10 l

CHRYSANTHEMUM

Suitable Chrysanthemum variety may be evolved to cultivate in Salem Dt with high yield and good self - Salem

Evaluation of chrysanthemum varieties / accessions being carried out at TNAU, Coimbatore since 2013. The variety Punjab Anuradha (Yellow type) continuously performing well under this condition. Yet it request further evaluation for confirmation.

GRAFTING IN SHF

Nursery Production Manual for State Horticultural Farms – Sivagangai

Nursery Production Manual for will be formulated and published for the benefit of Horticultural officers.

TAPIOCA, JACK, PAPAYA, GUAVA, HYBISCUS

Mealy bug Problem Control requested – Thanjavur

- Release 100 numbers of encyrtid parasitoid *Acerophagus papayae* for a small hamlet or village area of 8-10 ha. Conserve the lycaenid predator.
- Dissolve fish oil rosin soap @ 25 g/l, initially in luke warm water, then in required quantity of spray fluid in the sprayer.
- Release Australian ladybird beetle, *Cryptolaemus montrouzieri* @ 10 beetles/tree or 1500/ha
- Band the trees with 20 cm wide 400 gauge polythene sheets
- Follow ant control methods such as destruction of ant holes, red ant nests and skirting of trees after fruit harvest which prevents the ant migration through side branches.
- Spray chlorpyrifos 20 EC @ 2.5 ml/l or dimethoate EC 1.6 ml/l

MANDARIN ORANGE

Mandarin Orange cultivation is being reduced in Kotagiri and Coonor Block of Nilgiri District. Continuous effort of the farmers in Mandarin Orange cultivation has become unsuccessful for past years. Hence, we require technological assistance for the revival of mandarin orange cultivation for Coonor and Kotagiri Blocks - The Nilgiris

- A team comprising horticulturist, entomologist, pathologist, nematologist and soil scientist will be undertaking the visit to the consent area with permission of the University.
- After the visit the strategies for revival of mandarin orange cultivation for Coonor and Kotagiri Blocks will be formulated.

PACKAGE OF PRACTICE OF PROTECTED CULTIVATION

In Thoothukudi District protected cultivation is gaining more important among the Farmers and subsidies are given to the Farmers through various schemes of Horticulture development. The performance of crops raised under poly green House and shade net House is not up to the expected level of production. Hence it is

requested to conduct study for selection of crop variety and suitable package of practices under poly green House and shade net House in Thoothukudi District – Thoothukudi

- The precision farming technologies available for vegetable crops can be adopted for cultivation of vegetables under polyhouse and shade net house conditions provided the polyhouse should be climate controlled.
- In shade net house, the shade percentage should not be more than 35 percent for vegetable cultivation.

MORINGA PRUNING

In Thoothukudi District Moringa is one the important perennial vegetable crop cultivated more than 800Ha. Common local variety is under cultivation. The main problem faced by Farmer is fluctuation of price due to glut during season from June to August. Hence study on pruning technology for staggered yield round the year to help the Farmer to get uniform price throughout the year - Thoothukudi

Suitable research proposal will be formulated by AC & RI, Killikulam on season of pruning to regulate the production throughout the year.

IMPROVED PACKAGE OF PRACTICES OF RAINFED CHILLI

More than 10,000Ha areas are under Rainfedchilli cultivation. Though the main crop is chilli, mixed crop cultivation of 4 to 5crops (chilli, onion, coriander, vegetables) together by broadcasting without adopting any agronomical practices. Hence it is requested that suitable packages of practices to recommend mixed crop techniques for dry land cultivation for Thoothukudi District - Thoothukudi

- Chilli is being cultivated as a rain-fed crop in blocks of Vilathikulam, Pudur and Ottapidaram of Thoothukudi district both as pure and mixed crop. Normally sowing of this crop commences at the beginning of October and its yield is expected by March. The chilli crop yields only about 300 kilos to 500 kilos per acre in five spells of plucking on the rainfed soil. In direct sown chilli, the initial germination and subsequent seedling establishment and the high mortality rate of the seedlings are the major problem and seed pelleting as a pre-sowing treatment can enhance the germination and subsequent growth of seedlings.
- A research project proposal will be formulated from AC&RI, Killikulam, with an aim of developing improved practices exclusively for rain fed chilli including suitable mixed crops.
- Suitable research proposal to develop technologies for mixed cropping in rainfed chilli cultivation will be formulated by AC & RI, Killikulam.

AMLA

Fruit set – Tirupur

- In Amla, flowering is noticed from February and after fruit set there is a long period of dormancy and finally the fruits come to harvest in November. So moisture stress may be given in January.
- After fruit set starting from March the trees may be irrigated once in a fortnight.

BITTER GOURD

Fruitfly - Tirupur

- Collect the damaged fruits and destroy.
- The fly population is low in hot day conditions and it is peak in rainy season. Hence adjust the sowing time accordingly.
- Plough the field to expose the pupae.
- Use polythene bags fish meal trap with 5 g of wet fish meal + 1 ml dichlorvos in absorbent cotton. 50 traps are required per ha, fish meal + dichlorvos soaked cotton are to be renewed once in 20 and 7 days, respectively.
- Neem oil @ 3.0 as foliar spray as need based

FRUITS & VEGETABLE CROPS

Suitable fruits and vegetable crops to saline soil – Trichy

- In fruit crops the following crops are found tolerant to salinity which can be tried.
- Guava, Pomegranate, Karpooravalli.

HYBRID VEGETABLES

Suitable hybrid vegetables specific to Trichy district

The hybrids and varieties available in vegetable crops are suitable for cultivation in Trichy district.

ACIDLIME

Need Biocontrol measure to control canker - Vellore

Bio control of Acid lime

- Pruning and burning all the canker-infected twigs before monsoon and disinfecting the cuts with Bordeaux paint can prevent the further spread of disease.
- Neem cake suspension (1 kg in 20 litres water) during February, October and December.
- Three sprays of Streptocycline 100 ppm (10 g of Streptocycline + 5 g Copper Sulphate in 100 litres water) or Blitox (0.3%).

CASUARINA

Suitable control measures may be suggested for Wilt disease problem in Casuarina – Pudukottai

- Avoid over irrigation and water stagnation in the field. This will cause rotting of roots and other tissues. The affected plant shows yellowing foliage, top dying symptoms.
- Fully affected and dried plants along with the roots should be uprooted in order to avoid the spread of the pathogen from affected tree to the neighbouring healthy trees. Afterwards, the soil should be treated with Bavistin Fungicide solution (2 gm Bavistin powder in 5 litres of water) about 1 litre solution can be drenched to avoid further build up of the pathogen inoculum.
- The unaffected/ uninfested trees should be applied as prophylactic measures with the same fungicide solution as soil drenching.

QUALITY CONTROL

Suitable quality control analytical techniques may be evolved for Bio pesticides, Organic fertilizers and other Bio products – Erode

As on now, analytical techniques are available for assessing the neem based formulation using BIS protocol. Further, commercial product based on *Acorus calamus* and *Bacillus thuringiensis* were also assessed to conform the label requirements.

PLANT PROTECTION

Suitable sound system equipment may be evolved / suggested to overcome the problem of Peacock and Monkey which often damage the crops in farmers field - Pudukottai

In view of Wild Life Act, mechanical exclusion of the above two pests only could be done which in most occasions found to be not economical.

EFFECTIVE METHODS TO DRIVE AWAY BIRDS AND ANIMALS FROM AGRICULTURE FIELDS

Very often Agricultural crops like sorghum, cumbu etc are affected by birds. Cost effective methods to drive away birds may be evolved. In pulses fields, Peacock and other birds eat seeds that are sown in field. Mechanical Methods to drive away birds may be evolved – Ramnad

Birds scarer acoustic device and reflective colour ribbons though found to be promising, the pests used to get accustomed.

Eco friendly repellent spray may be developed for Crop damage due to wild animals in Western ghats area – Madurai

Developing strategies to avoid the wild animal conflict requires the policy decision. Existing legal procedures would allow to take the chance of testing any product (like chilli powder/ repellent botanicals) against the wild life

Instead of spraying the Pesticide to control pests a new practice of using the Pesticide by dissolving them in Irrigation Channel water-Suggestions, Recommendations on this technology- requested- Vellore

Pestigation is possible against the selected pests based on the biology of the pest to be managed.

In Kancheepuram districts, wild bore (pig) menace is very sever in some parts of the district. Often they cause significant damage to the crop and resulting in heavy loss to farmers. Since they are protected by forest law, effective repellent mechanism may be developed to safe guard the farmers, as well as those animals – Kancheepuram

Identifying effective repellent against any wild animal also requires the knowledge on the biology to be observed under proximity and also access to test the proposed repellents with the test wild animals which are not feasible with the prevailing legal condition. The only feasible method is to prevent their entry by mechanical structure which is found to be costly and uneconomical.

Dosage for new pesticide formulation molecules such as validamycin, Kasugamycin, metsulfuran methyl, chlorimuronethyl, streptomycin sulphate, Tetracycline hydrochloride etc are not available. Similarly, lot of combination pesticides are also moving in the market. So, dosage may be given for the effective usage of these pesticides – Kancheepuram

Quality Control Department are expected to take care of the issues.

GENERAL

Suitable cropping pattern may be recommended for the farmers of this district – Salem

Depending on water and soil conditions the cropping pattern differs.

IPM Technology for the control of mealy bug may be suggested – Dindigul

Removal of alternate weed host like, *Abutilon indicum* (Thuthi) and *Solanum nigrum* (Manathakkali) in the vicinity of cropped area.

Monitoring emergence of crawlers at basal stem.

Use of neem oil 2%, NSKE 5% and fish oil rosin soap 25g /l.

Release of encyrtid parasitoid, *Acerophagus papayae* @ 100 per village. Spraying of dimethoate 30 EC or profenofos 50 EC 2ml / l thoroughly drenching the crop using high volume sprayer.

Botanical Bio-Pesticides other than Neem is required- Dindigul

Acorus calamus commercial product as 10 D is found to be promising bio pesticides against rice earhead bug. Efficacy against other important pests are being evaluated.

Fertigation schedule for applying Fertilizers through drip irrigation is required for all crops. Dindigul

Drip fertigation schedule for Cotton, maize & redgram is available in CPG.

Suitable crop production technologies required to mitigate drought condition - Krishnagiri

- Rice: Foliar spray of 1% urea + 2% DAP + 1% KCl at PI and 10 days later may be taken up for enhancing the rice yield if sufficient soil moisture is ensured
- Spray Cycocel 1000 ppm (1 ml of commercial product in one lit. of water) under water deficit situations to mitigate ill-effects.

- Foliar spray of Kaolin 3% or KCl 1% to overcome moisture stress at different physiological stages of rice
- Sorghum : Pre sowing seed hardening \emptyset Soak the seeds in 2% KH₂PO₄ for 16h in a seed to solution ratio of 1:0.6 and dry back the seeds to original seed moisture content (8 – 9%) under shade. This can be adopted both for the garden and dry land ecosystem.

Tannery effluent affected area:

- a) **Wherever possible the cultivation of water loving crops like Paddy, Sugarcane may be discouraged and short duration crops with minimum water requirement like Pulses, Maize, Ragi, Groundnut and Gingelly may be encouraged. In this regard an alternate cropping strategy may be suggested - Vellore**

Alternate cropping strategy Irrigated: Tapioca, Castor + groundnut, Cotton – groundnut – pulses, Maize – groundnut /Sesame /turmeric

Rainfed: Tapioca, Castor + groundnut – horsegram, Minor millets- horse gram

Suitable technology for foliar spray of micro nutrients. In Tirunelveli District farmers are using micro nutrients as foliar spray for all crops. Hence suitable recommendations of foliar spray in all crops may be evolved - Tirunelveli

Similar to macronutrients, Soil testing for available micronutrients needs to be performed for micronutrient applications. When the soil test values go below the critical limit of the a particular micronutrient, there is a need for micronutrient fertilisation. Without soil testing, indiscriminate application of micronutrient fertilisers needs to be avoided. In addition to the soil application, foliar sprays are found to correct nutrient disorders in crop plants during the crop growth period. The details of foliar spray recommendations are given below.

Generalized recommendation for foliar spray of micronutrient for crops

Element	Fertilizer	Concentration
Zinc	Zinc sulphate	0.5 %
Iron	1.0% Ferrous sulphate + 0.10 % Citric acid	
Manganese	Manganese sulphate	0.2 %
Copper	Copper sulphate	0.2 %
Boron	Boric acid	0.2 %
Molybdenum	Sodium molybdate or Ammonium molybdate	0.05 %

100% control could not be achieved with available technology (1Kg CuSO₄/ acre and applying more potash)(Kulithalai Block- Delta area)

Application of copper sulphate at the rate of 5 Kg/ha as soil application / soil drenching is effective for controlling green algae in rice.

Combination of management practices and chemical methods viz., alternate wetting and drying; delayed phosphatic fertilizer application (15-30 days after transplanting) and copper sulphate at 5 Kg/ha may be followed for eradication of green algae.

Chelated copper in the form of gluconates and EDTA will be evaluated for green-algal control under laboratory and field conditions.

PPFM spray is useful to mitigate drought situation. But, this spray requires large volume of water. Hence, alternate method of application of PPFM may be evolved which requires lesser quantity of water.

The spray volume (200 lit/ac) is for uniform application of PPFM in the leaf surface of the plants. If the volume is reduced, the distribution of PPFM in the crop could not be achieved. Reducing the spray volume will not cause adverse effect on crop. However, PPFM application through low-volume sprayer will be evaluated.

Research on use of microorganisms for solubilizing phosphorus in calcareous soil instead of gypsum application

Only solubilization of nutrients and their availability to crops by organic acid production by microbial inoculants is possible. The soil pH reduction through microbial inoculation is not possible, as the organic acids produced by these microbes will not be sufficient to neutralize the pH of the calcareous soil.

Suitable technologies for On Farm Production of bio-fertilizers should be standardized and popularized.

On-farm production technologies for AM fungi, *Azolla* and BGA are available for adoption by the farmers. On-farm production of bacterial biofertilizers is not possible due to high cost and expertise involved.

