

**NEW CROP VARIETIES, FARM IMPLEMENTS  
AND MANAGEMENT TECHNOLOGIES**

**2006**



**TAMIL NADU AGRICULTURAL UNIVERSITY  
COIMBATORE – 641 003**

**NEW CROP VARIETIES, FARM IMPLEMENTS  
AND MANAGEMENT TECHNOLOGIES**

**2006**

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## TAMIL NADU AGRICULTURAL UNIVERSITY

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### FOREWORD

Tamil Nadu Agricultural University is releasing new varieties, farm implements and management technologies every September 9, 2006. These new varieties, farm implements and management technologies are being adopted by the farmers and get benefited.

This year TNAU released 11 varieties in agricultural crops, 3 in horticultural crops, 7 farm implements and 8 management technologies will be definitely useful to the farmers.

The information given in this booklet is not only useful to farmers but also Agricultural Extension Officers. At this juncture I whole heartedly congratulate the scientists who have contributed for the development of these new varieties, implements and management technologies.

  
(C.RAMASAMY)

## NEW CROP VARIETIES

### 1. HYBRID RICE - CORH 3

#### Special features

- Early duration (115 days)
- High yield potential
- Medium slender white grain with good cooking and keeping quality
- Tolerant to blast and RTD
- Resistant to GLH and tolerant to WBPH and BPH
- Synchrony in flowering of the parents

**Parentage** : TNAU CMS 2A / CB 87 R  
**Duration (days)** : 110 – 115  
**Season** : Kar / Kuruvai / Sornawari / Navarai  
**Grain yield**

Kg / ha	6475
% increase over	
ADT 39	24.3
ADT 43	28.4
ADTRH 1	13.2

**Highest yield obtained** : 10972kg/ha  
**Area of adoption** : Through out Tamil Nadu under irrigated  
 1 planted condition

#### Scientists responsible for release

- K.Thiyagarajan, S.Manonmani, S.Rajeswari, S.Robin, K.Mohana Sundaram, R.Rabindran, S.Suresh, Subbalakshmi Lokanadhan, C.N.Chandrasekar, C.Surendran and T.S.Raveendran

## 2. RICE – RMD (R) 1

### Special features

- Suited for rainfed direct seeding
- Short duration
- High yielder under rainfed direct seeding
- Drought tolerant
- Semi dwarf, non-lodging and non-shattering habit
- Long bold white rice with 1000 grain weight of 24.3 g
- High amylase content (25.6%) and head rice recovery (59%)
- Resistant to stem borer and leaf folder
- Tolerant to bacterial leaf blight, blast and sheath rot

**Parentage** : Selection from TGR 75R

**Duration (days)** : 100-105 days

**Season** : September – October (Rainfed direct sowing)

### Grain yield

Kg / ha	4000
% increase over	
PMK 2	20.1
PMK 3	21.8
MDU 5	25.5

**Highest yield obtained:** 5134 kg/ha<sup>-1</sup>

**Area of adoption** : Ramanathapuram, Sivagangai and Thiruvallur districts under rainfed rice cultivation ecosystem

### Scientists responsible for release

- L.Mahalingam, S.Mahendran, A.Balan, <sup>2</sup> S.Viswanathan and N.Chitra

## 3. RICE - TPS (R) 4

### Special features

- Very early duration with high yield
- Medium bold white rice
- Field tolerance to disease blast, brown spot and sheath blight and stem borer, leaf folder, BPH and GLH

**Parentage** : TS 29 / ASD 16

**Duration (days)** : 95

**Season** : Kannipoo (Jun-Sept.)  
Kumbapoo (Oct.-Feb.)

### Grain yield

Kg / ha	5840
% increase over	
MDU 5	20.0
ASD 17	27.0

**Highest yield obtained** : 8050 kg/ha

**Area of adoption** : *Kadaivarambu* (tail-end) rice area of canal irrigated system of Kanyakumari district

### Scientists responsible for release

- APM.Kirubakaran Soundararaj, P.Gomathinayagam, M.Madhan Mohan, F.Salal Rajan, C.Gailce Leo Justin, B.Uthayakumar, G.Guru and P.Banumathi

#### 4. HYBRID MAIZE - COH(M) 5

##### Special features

- High yielding single cross hybrid
- Resistance to downy mildew disease
- Moderate resistance to stem borer
- Bold, yellow colour grains
- High starch (68.7%) and protein (8.23%)
- Hybrid seed production is easy

**Parentage** : Single cross hybrid of UMI 285 (Female) and UMI 61 (Male)

**Duration (days)** : 100 – 105

**Season** : Irrigated - Throughout the year  
Rainfed - Puratasipattam (Sept. – Oct.)

##### Grain yield

	Irrigated	Rainfed
(kg/ha.)	5400	4280
% increase over		
COH(M) 4	24.0	

**Highest yield obtained** : 8500 kg/ha

**Area of adoption** : All maize growing districts of Tamil Nadu

##### Scientists responsible for release

- S.Arumugachamy, B.Meenakumari, B.Selvi, T.S.Raveendran, G.Mohan, K.Ponnusamy, C.Gopalakrishnan and M.R.Srinivasan

## 5. SAMAI - CO (Samai) 4

### Special features

- Higher yield with bold nutritive grains
- Shorter in duration and drought tolerant
- Suitable for double cropping dryland situation (Samai – Horsegram)
- No pest and diseases incidence in normal sowing season
- Palatable fodder

**Parentage** : CO 2 / MS 1684

**Duration (days)** : 75-80

**Season** : Rainfed – Adipattam (June-July)

### Grain yield

Kg / ha	1567
% increase over	
CO 3	14.2
Paiyur 2	12.7

**Highest yield obtained** : 2820 kg/ha

**Fodder yield** : 5783 kg/ha (9.4% over CO 3)

**Area of adoption** : Dharmapuri, Krishnagiri, Vellore, Tiruvannamalai, Salem, Trichy, Villupuram, Dindigul, Namakkal and Theni districts

### Scientists responsible for release

- A.Nirmalakumari, N.Kumaravadivel, A.John Joel, N.Senthil, B.Selvi, K.Mohanasundaram, N.Subbaraman, T.S.Raveendran and T.Raguchander

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## 6. GREENGRAM - CO (Gg) 7

### Special features

- High yielder
- Short duration
- High protein content (25.2%)
- Seeds are medium bold with good cooking quality
- Released as COGG 912 at All India level for Southern Zone and notified by the Central Variety Release Committee

**Parentage** : MGG 336 / COGG 902

**Duration (days)** : 62

**Season** : June - July

### Yield

Kg / ha	978
% increase over	
CO 6	23.5

**Highest yield obtained** : 992 kg/ha

**Area of adoption** : Entire Tamil Nadu

### Scientists responsible for release

- P.Jayamani, N.Kumaravadivel, AR.Muthiah, B.Subbalakshmi, T.Kalaimagal, P.Veerabahiran, S.Rajarathinam, D.Alice, C.Durairaj and T.S.Raveendran

## 7. MOTH BEAN - TMV (Mb) 1

### Special features

- Erect and early maturing variety
- High yield and high protein content (24.8%)
- High fodder yield
- Moderately resistant to white fly, pod borer and yellow mosaic virus disease.

**Parentage** : Pureline selection from Villupuram local

**Duration (days)** : 65-70

**Season** : Rabi (Nov.–Dec.) (Karthigaipattam)

### Yield

Kg / ha	933
% increase over	
Villupuram Local	30.3

**Highest yield obtained** : 1830 kg/ha

**Dry fodder yield** : 3.13 tonnes / ha (16.7% over Local)

**Area of adoption** : Villupuram District

### Scientists responsible for release

- V.Manoharan, V.K.Ravichandran, R.Vaidyanathan, P.Loganathan, E.Sumathi, P.Renukadevi, M.Devanathan and V.Manivannan

## 8. GROUNDNUT - TMV (Gn) 13

### Special features

- Tolerance to terminal water stress
- Basal pod setting
- Acceptable pod traits
- Red kernel and high oil content

**Parentage** : Selection from Pollachi red

**Duration (days)** : 100 – 105

**Season** : Rainfed and Irrigated

### Yield

	Rainfed	Irrigated
Kg / ha	1613	2580
% increase over		
VRI 3	20.4	17.5
TMV 2	22.4	25.8
Local Red	24.0	21.8

**Highest yield obtained** : 4550 kg/ha

**Area of adoption** : Groundnut growing areas of Tamil Nadu

### Scientists responsible for release

- V.Muralidharan, N.Manivannan, P.Vindhiyavarman, V.Manoharan, T.S.Raveendran, G.Umapathy and P.Devagi

## 9. SUNFLOWER – CO (SFV) 5

### Special features

- High autogamy (>70 %)
- High oil content (40.3 %)
- High oil yield

**Parentage** : 8<sup>th</sup> derivative of *Helianthus annuus* / *Helianthus praecox*

**Duration (days)** : 85 – 90

**Season** : Rainfed and Irrigated

### Yield

	Rainfed	Irrigated
Kg / ha	1360	1520
% increase over		
CO 4	18.5	15.6
Morden	37.7	34.7

**Highest yield obtained** : 3550 kg/ha

**Area of adoption** : Sunflower growing areas of Tamil Nadu

### Scientists responsible for release

- V.Muralidharan, N.Manivannan, B.Subbalakshmi, P.Vindhiyavarman, T.S.Raveendran, G.Umapathy, P.Dhevaki, B.Punitha and R.Karthika

## 10. COTTON - KC 3

### Special features

- Medium duration
- High yielder with a seed cotton yield of 1081 kg/ha
- Good ginning out turn of 37 %
- Medium long staple cotton (26.4 mm)
- Fibre strength : length ratio is 0.81 (CIRCOT norm 0.8)
- Moderately resistant to leafhopper
- Resistant to *Alternaria* and grey mildew diseases
- Tolerant to drought

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**Parentage** : TKH 497 / KC 1

**Duration (days)** : 140

**Season** : September – October (Rabi)

### Yield

Kg/ha (seed cotton)	1080
% increase over	
KC 2	35.3
MCU 10	35.8
LRA 5166	30.2
SVPR 2	63.5

**Highest yield obtained** : 2146 kg/ha of seed cotton

**Area of adoption** : Suitable for cultivation in rainfed black cotton soil tracts of Tuticorin, Tirunelveli and Virudhunagar districts during North East monsoon season

### Scientists responsible for release

- D.Krishnadoss, R.P.Gnanamalar, N.Muppithathi, R.Ravikesavan, R.Sankarapandian, R.Ramamurthy and K.Subbiah

## 11. SUGARCANE - COC (SC) 23

### Special features

- Good ratooner and CCS = 12.95%
- Moderately resistant to red rot
- Non -lodging, non flowering
- Solid cane without brittleness
- Suited for pit method of planting, drip irrigation system and mechanical harvesting
- Drought tolerant
- More fibre content (12.52%), Ideal for Co-generation

**Parentage** : 69 A 591 GC

**Duration (days)** : 300 – 330

**Season** : Early and s 10

### Yield

	Cane	Sugar
t / ha (plant crop)	133.05	17.64
% increase		
CO 86032	11.15	13.51
COC 98061	14.40	23.96

**Highest yield obtained** : 235.0 t / ha

**Area of adoption** : Tamil Nadu and Pondicherry, under normal irrigated condition and all soil types

### Scientists responsible for release

- R.S.Purushothaman, C.Babu, R.Durai, T.Kalaimani, R.Panneerselvam, S.Nasir Ahmed, B.Rajendran, G.Manickam, K.Karunanidhi, J.Karamathullah, K.Kannappan, V.Ganesaraja N.Tamilselvan, S.Muralikrishnasamy, V.K.Duraisamy, M.Jayachandran and N.Dhara

## 12. TOMATO - COLCRH 3

### Special features

- Plants are semi determinate (80-85 cm) and suitable for high density planting
- Fruits are smooth round to slightly oblong, medium sized, unripe fruits whitish green, ripe fruits bright red coloured and borne in clusters of 3-5 fruits
- (Fruit weight 65-70 g)
- Resistance to leaf curl virus disease
- High yielding and suitable for cultivation without pesticide spray

**Parentage** : LCR 2 / CLN 2123 A

**Duration (days)** : 140 -145

**Season** : May-June, Nov.-Dec. and Feb.-Mar.

### Yield

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t / ha (Fruits)	90.2
% increase over	
COTH 1	22.4
Lakshmi Hybrid	27.9

**Highest yield obtained** : 117.3 t / ha

**Area of adoption** : Coimbatore, Dharmapuri, Salem, Madurai, Namakkal, Thiruvannamalai, Thirunelveli, Thoothukudi, Trichy, Virudhunagar, Villupuram and Erode districts under irrigated condition.

### Scientists responsible for release

- D.Veeraragavathatham, S.Natarajan, N.Ragupathi, J.Auxcilia, E.Vadivel, L.Pugalendhi, S.Sasikala, P.Muthulakshmi and R.Samiyappan

### 13. CHILLI - KKM (Ch) 1

#### Special features

- High yielder
- Plants are dwarf, compact and spreading
- Fruits are attractive red in colour and do not shrink much after drying and hence could fetch better price in market
- Relatively high capsaicin content (0.54%), oleoresin content (14.3%) and seed content (49.79 Nos./ pod)
- Moderate resistance to fruit rot (Percent Disease Index value 1.10)
- Field tolerance to mosaic disease (Percent Disease Incidence value 3.02)

**Parentage** : Hybrid derivative of Acc. 240 / CO-3

**Duration (days)** : 200

**Season** : September – October

**Yield** 12

t / ha (Dry pods)	3.03
% increase over	
PKM 1	35.61
K 1	38.41

**Highest yield obtained** : 3.762 t /ha

**Area of adoption** : Tirunelveli, Thoothukudi, Virudhunagar and Ramanathapuram under garden land condition

#### Scientists responsible for release

- P.Paramaguru, P.Nainar, S.Thamburaj, S.Velmurugan, V.Ponnuswami, I.R.Suthanthira Pandian, V.Veerabadran, R.Venkatachalam, D.Veeraragavathatham, E.Vadivel and T.M.Thiyagarajan

### 14. THYME - Ooty (Tv 1)

#### Special features

- High green leaf yield potential
- Leaves possess high thyme oil content (0.7%), local 0.4%. Thyme oil contains 23.63% of thymol chemotype (a major constituent for its medicinal properties), local type contains 20.2%
- Green and dried leaves possess excellent aroma and cooking quality
- Resistant to root rot disease, root knot nematode and white flies and aphids

**Parentage** : Pureline selection from five germplasm types

**Duration** : Perennial and commercially viable upto 4 years

**Season** : June – July and Sept. – October (rainfed)

#### Yield

t / ha (Green leaves / year)	13	10.7
% increase over		
Local		33.7

**Highest yield obtained** : 11.5 t /ha

**Area of adoption** : The temperate zone of the Nilgiris from 900 to 2500 m above MSL and similar areas. Suitable for well drained loamy soil with a PH of 5.5 to 6.5

#### Scientists responsible for release

- N.Selvaraj, B.Ramaraj, L.Mohan, B.Anita, G.V.Rajalingam, K.Shoba, B.Anusha, S.Maheswari and S.Jayalakshmi

## FARM IMPLEMENTS

### 1. COCONUT TREE CLIMBER

#### Special features

- Useful for climbing coconut trees for harvesting nuts, cleaning and other operations
- Any unskilled person including ladies can climb the coconut trees using this unit
- Requires 1.5 minutes to climb a tree of 30 to 40 ft height

**Cost of the unit** : Rs.2,000/-

**Capacity** : 50 to 60 trees / day

**Cost of operation** : Rs.1.50 / tree

**Scientists responsible for release** : D.Anantha Krishnan, V.M.Duraisamy, R.Kavitha and Balaji Kannan

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### 2. TWO ROW FINGER TYPE PADDY ROTARY WEEDER

#### Special features

- Useful for weeding in paddy row crops
- Row spacing can be adjusted for 20cm and 25 cm
- One man can easily operate the unit continuously
- By push pull action the weeds are buried and soil aerated

**Cost of the unit** : Rs.900/-

**Capacity** : 0.35 ha / day

**Cost of operation** : Rs.250 / ha

**Saving in cost** : 80%

**Saving in labour** : 60%

**Scientists responsible for release** : D.Anantha Krishnan, R.Manian, R.Kavitha, V.M.Duraisamy and E. Anantha Krishnan

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### 3. SEED CUM FERTILIZER DRILL FOR PADDY

#### Special features

- Useful for direct sowing of paddy and simultaneous application of fertilizer
- The seed rate and fertilizer rate can be adjusted
- Can be operated by a 35 HP tractor
- By applying the required quantity of fertilizer at root zone, better crop growth and more yield is obtained

**Cost of the unit** : Rs.35000/-

**Capacity** : 3 ha/day

**Cost of operation** : Rs.800 / ha

**Saving in cost** : 65%

**Saving in labour** : 84%

**Scientists responsible for release** : D.Anantha Krishnan, R.Manian, S.Ma 16 and M.Ramasamy

### 4. TRACTOR OPERATED PIT DIGGER FOR SUGAR CANE PLANTING

#### Special features

- Dig two pits of 90 cm dia simultaneously at 1.5 m interval to a depth of 30 cm suitable for planting sugarcane setts
- Planting of cane in 1.5 x 1.5 m spacing with pit method favours higher cane yield
- Recommended as technology package under drip fertigation system for cane

**Cost of the unit** : Rs.65000/-

**Capacity** : 250 to 300 holes / hour

**Cost of operation** : Rs.300 / hour

**Saving in cost** : 63%

**Saving in time** : 97%  
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**Scientists responsible for release** : S.Manendran, R.Manian and K.Kathirvel

## 5. HAND OPERATED AONLA SEED REMOVER

### Special features

- The seed remover is simple and easy to handle
- Deseeded fruits with punch hole increases the osmosis of syrup
- Mechanical pulping of fresh aonla is feasible without seeds

<b>Cost of the unit</b>	:	Rs.1000/-
<b>Capacity</b>	:	20 kg/hr (or) 530 fruits / hr
<b>Cost of operation</b>	:	Rs.10/hr
<b>Saving in cost</b>	:	90%
<b>Scientists responsible for release</b>	:	K.Thangavel and Saraswathi Eswaran

## 6. SUGARANE SETT CUTTER

### Special features

- Useful for cutting sugarcane sett with single bud
- Reduce the cost of seed cane
- Additional income from the budless internodes

<b>Cost of the unit</b>	:	Rs.2750/-
<b>Capacity</b>	:	One sett / second
<b>Cost of operation</b>	:	Rs.240 / ha
<b>Saving in cost</b>	:	45%
<b>Saving in time</b>	:	70%
<b>Scientists responsible for release</b>	:	S.Enayathullah Shah, S.Kalaiyaran S.Nandhakumar, B.Chandrasekaran M. Senthil Kumar and A.Subramanian

## 7. MINI COMBINE HARVESTER FOR PADDY

### Special features

- Harvesting, threshing, winnowing operations are carried out simultaneously
- Suitable for small and marginal farmers
- Can be easily transported to inaccessible fields

<b>Cost of the unit</b>	:	Rs.2,00,000/-
<b>Capacity</b>	:	1 ha / day
<b>Cost of operation</b>	:	Rs.1300 / ha
<b>Saving in cost</b>	:	80%
<b>Saving in labour</b>	:	91%
<b>Scientists responsible for release</b>	:	D.Manohar Jesudas, K.Kathirvel and R.Manian

## MANAGEMENT TECHNOLOGIES

### 1. DIRECT SEEDING OF RAINFED RICE USING SEED CUM FERTILIZER SEED DRILL

#### Details of Technology

- Rainfed rice cultivation requires good tilth for uniform sowing of seeds by using tractor drawn seed cum fertilizer seed drill. For direct rice seeding the field has to be ploughed to fine tilth and blanking should be given before taking up sowing. By using the tractor drawn seed cum fertilizer seed drill the rice seeds and the recommended basal dose of phosphorus as DAP can be placed to a depth of 2.5 to 3.0 cm without overlapping as per monsoon sowing. The seeds and the applied fertilizer will be automatically covered by the iron rod passing behind the seed drill. In this method of sowing a seed rate of 75 kg ha<sup>-1</sup> will be required to cover one hectare of land as against the seed rate of 100 kg ha<sup>-1</sup> required for the farmer's method of sowing.

#### Benefits

Seed cum fertilizer seed drill sowing is one of the best options to increase the productivity of rainfed direct seeded rice crop in the coastal district of Ramanathapuram. This technology has many advantages as listed below

- A saving of seed rate by 25 kg / ha
- Proper placement of seed and fertilizer to a depth of 2.5 cm helps to get better and deeper root system which favours better utilization of moisture and thus the crop is able to withstand drought in a better way.
- Line sowing favours easy hand weeding and introduction of mechanical weeding is also possible in this system and thereby reduces the cost on weeding.
- Uniform and optimum plant population maintenance is possible by adopting this technology which will result in higher grain yield with net returns

#### Economics

- Seed cum fertilizer drill sowing recorded the highest net return of Rs.13,152/- compared to Rs. 21 registered in farmer's method of sowing with higher B:C ratio of 2.35.

#### Scientists responsible for release

- S.Mahendran, M.Ramasamy and D.Anantha Krishnan

## 2. MODIFIED RICE MAT NURSERY FOR EARLY TRANSPLANTATION UNDER MODIFIED SRI METHOD OF CULTIVATION

### Details of Technology

- In the conventional wet bed nursery, seedlings do not attain the expected size (15 to 20-cm height) even at 25-30 days after seeding (DAS) because of invariably high seeding rate and poor nursery management. Therefore we decided to develop a modified rice mat nursery (MRMN) for producing robust, healthy rice seedlings in 15 days time suitable for transplantation with single seedling per hill.
- Shallow raised beds to a height of 5 cm and width of 1.2 m are to be raised in the field or any convenient place having water facility and free from animal trespass. The length of the bed can be of any convenient size. 100 m<sup>2</sup> mat nursery is required to produce seedlings that are sufficient for planting one ha of field. Native field soil alone (if very fertile) or soil + pressmud mixture (1:1) or soil + well decomposed FYM (1 kg FYM mixed with the soil required for 1 m<sup>2</sup> nursery bed) are identified as suitable seed bed medium to take up sowing. The 4 cm thick seed-bed medium blended with well-powdered DAP (20-25 g for 1 m<sup>2</sup> seed-bed medium) is to be poured inside a pre-fabricated wooden seed frame placed over the polyethylene layer or used fertilizer gunnies. The pre-germinated seeds at the rate of 5-8 kg/ha are to be sown in the 100 m<sup>2</sup> seed-bed (50-g dry seed or 100 g wet seed per m<sup>2</sup>) depending upon the variety and germination percent of the seed. Then, seeds should be properly covered using the same seed-bed medium, gently pressed with hand, sprinkled with water uniformly to saturate the medium. The seed frame is to be carefully removed and the sowing process continued till the required area was sown. The mat nursery is to be sprinkled with water 2-3 times a day up to 5 days after sowing using a rose can. After 5<sup>th</sup> day, water can be let in between the mat nursery beds to keep the beds soaked, but not submerged. On 9<sup>th</sup> day of sowing 0.5% urea solution (50 g in 10 lit of water) may be drenched over the seedling bed with the help of a rose can. Water should be drained two days prior to lifting and transportation of seedling mats to the main field for transplanting.

### Benefits

- Production of robust seedlings in 15 days
- 18-20 cm tall seedlings with 4-5 leaves
- Saving of cost on seed, labour, fertilizer & water

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### Economics

- Reduced the cost on seed by 85- 90%, fertilizer by 90%, labour by 34% and water use by 55%.
- Limited land use
- The cost of seedling production to plant 1 ha of main field is reduced by about Rs.1600/-
- Saving of 50% of cost when compared to conventional wet bed nursery.

### Scientists responsible for release

- R.Rajendran, V.Ravi, N.Chelliah, T.Jayaraj, B.Chandrasekaran, S.Ramanathan and V. Balasubramanian

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### 3. PIT METHOD OF SUGARCANE PLANTING UNDER DRIP FERTIGATION SYSTEM

#### Details of Technology

- Pit to pit spacing : 1.5 x 1.5 m
- No. of pits/ha : 4,444 pits
- Pit diameter : 0.9 m
- Pit depth : 0.38 m
- No. of budded setts / pit : 32 (Single budded setts)  
Fill the pits to a depth of 15 cm with compost and native soil and mix it well. Place the healthy setts in circular fashion leaving 10 cm from the outer boundary of the pits with equal spacing between each setts and cover the setts with soil. On 50 to 60 days after planting give partial earthing up by sliding the soil from the outer boundary of the pit and full earthing up should be given leaving a depression of 2.5 cm from the ground level at 90 to 100 days after planting.
- Fertilizer dose : 275:62.5:112.5kg NPK/ha  
The entire phosphorous dose can be applied as basal at the time of planting. The nitrogen and potassium as urea and MOP (White potash) should be applied through fertigation system in 14 equal splits starting from 15 DAP upto 210 DAP
- Drip design : Lateral to lateral spacing 3.0 m (Alternate rows)  
8 mm micro tubes on either side of the lateral to a length of 1.0 m with one 8 LPH drippers / pit.
- Irrigation : Daily or in alternative days

#### Benefits

- Higher cane yield
- Multi rationing is possible
- Suited in problem soils
- More water saving
- System maintenance is easy
- Less labour for after cultivation operations
- Higher net return

#### Economics

- Pit planting of cane in 1.5 m x 1.5 m pit spacing registered the highest net return of Rs.1,19,649 ha<sup>-1</sup> and 1,55,982 ha<sup>-1</sup> with in B:C ratio of 2.26 and 3.31 in plant and ratoon crops respectively compared to the net return of Rs1,16,650 and 1,27,360 registered in conventional method of cane cultivation in plant and ratoon crops.

#### Scientists responsible for release

- S.Mahendran, S.Ramanathan, P.Rajarathinam, R.Jeyasrinivas and V.Murugappan

#### 4. MICRO SPRINKLER IRRIGATION FOR CURRY LEAF

##### Details of Technology

- Micro sprinkler irrigation is done for two days at 40 per cent pan evaporation (PE) under paired planting with a spacing of 0.75 m between rows and 1.25 m between pairs of rows.
- Micro sprinkler irrigation schedule for sandy loam soils

##### Season Time of operation

January – February 1 hr.

March – June 1 hr. 30 min.

July – September 1 hr.

October – December 45 min.

- In the case of lay-out, laterals are to be laid at 2 m interval and each micro sprinkler is to be erected in the centre of four plants within the paired row. The micro sprinklers of 16 lph are to be placed at 2 m spacing along the lateral.

##### Benefits

- Saving in irrigation water upto 51 per cent
- Surface irrigation : 1134 mm/year
- Micro sprinkler irrigation : 555 mm/year
- Area under irrigation will be twice
- Saving in energy, labour and other inputs

##### Economics

Added cost for micro sprinkler installation = Rs.49,000/ha  
 Taking the life of the system as ten years, = Rs.9,800/ha  
 added cost per ha per year  
 Added returns per year = Rs.2,238/ha

Reduction in cost in micro sprinkler irrigation per year :  
 Value of labour saved due to reduced irrigation charges = Rs.9,000/ha  
 Reduction in weeding cost = Rs.9,600/ha  
 Total reduction in cost = Rs.18,600/ha

Particulars	
(Rs./ha) Surface irrigation	Micro sprinkler irrigation
Gross return 7: 26	1,092
Total cost of cultivation	20,854 15,250*
Net return	53,000 60,842

\* includes cost of micro sprinkler systems apportioned for ten years (Rs.49,000/ha.)

Net change in income (increase in profit) = (Rs.60842 - Rs.53,000)  
 = Rs.7,842/ha

Hence as per partial budgeting micro sprinkler irrigation is economically feasible

##### Scientists responsible for release

- P.Manickasundaram, P.K.Selvaraj, V.K.Duraisamy and C.Chinnusamy

## 5. SHADE NET CULTIVATION WITH FERTIGATION IN TOMATO

### Details of Technology

- The influence of shade and fertigation on growth and productivity of tomato were standardized.
  - Hybrid : Ruchi
  - Shade : 35 per cent
  - Spacing : Paired row planting 80x40x60 cm (between pairs, rows and plants)
- Fertilizer application
  - Basal : NK each @ 50 kg/ha and P at 250 kg/ha through straight fertilizers
  - Fertigation : NK each @ 200 kg/ha through straight fertilizers

### Benefits

- Fetches a premium price in the market where there is demand for the fruits during summer.
- Shade net cultivation helps to grow tomato under protected environment to increase the productivity during off seasons.
- Besides high productivity the shade net also acts mechanical barriers to pest and vectors of viral diseases.
- Microclimate in the shade net will minimize the crop loss due to abiotic stresses and also reduces the weed intensity greatly.
- Shade net can be utilized during rainy season also vegetable crops with higher marketable price can be grown in order to fetch higher returns which provide year round production.

### Economics

- Yield (t/ha) : 96.0
- B/C ratio : 3.07

### Scientists responsible for release

- S.Natarajan, E.Vadivel, L.Pugalendhi, M.Kavitha, S.Sasikala and K.Srinivasan

## 6. PROTECTED CULTIVATION TECHNIQUES FOR CUT CHRYSANTHEMUM

### Details of Technology

- The growing medium, irrigation regime, fertilizer application and photoperiod regulation for Cut Chrysanthemum under poly house conditions were standardized

Variety : Yellow Regan

Area of Poly house : 1000 m<sup>2</sup>

Growing Media : Soil + Compost + Cocopeat @1:1:2

Irrigation : 40 kPa

Spacing : 20 x 15 cm

Nutrition : 10:20:10 g/m<sup>2</sup> NPK through soil application as basal, i.e.50% N as basal and remaining 50% N i.e. 10 g/m<sup>2</sup> as top dressing at flower bud opening stage.

Spacing : 20 x 15 cm

Photoperiod : 14 hours dark and 10 hours light

Light intensity : 3000 Lux

Temperature : 25 -35<sup>o</sup> C

Relative humidity : 60-70' 28

### Benefits

- Ensures high productivity with good quality flowers.
- Act as a mechanical barrier to pests and diseases.
- Microclimate regulation will reduce the crop loss due to climatic factors.
- An eco-friendly cultivation system, which reduces the use of harmful chemicals.
- Beneficial for off season production by providing short day conditions.

### Economics

- This technology helps the grower get an average of 240 sprays/m<sup>2</sup> (239.3 during summer and 240.3 in winter) with 3.54 flowers /spray in summer and 3.56 / spray in winter

Gross returns : Rs.15,12,000 /-

Cost of production : Rs.4,39,200 /-

Net return : Rs.10,72,800 /-

BC Ratio : 1: 3.44

#### **Scientists responsible for release**

- M.Jawaharlal, T.Arumugam, V.A. Sathiyamoorthy, R.Arulmozhiyan and E.Vadivel

## **7. DRIVING OFF ROCK BEES WITH NEWLY DESIGNED ROCK BEE SMOKER**

### **Details of Technology**

- Rock bees which build their nests on buildings or tall trees sometimes pose a problem to human beings. They can be driven out by using this newly designed rock bee smoker. The smoker consists of a smoker body, a blower and delivery system. The smoker is manually operated and useful to take up the smoke generated by using coconut husk and chicken feather mechanism closer to the colony with the help of blower and delivery. The smoke generated is sucked up and delivered at the required site. After the desertion of the comb by bees, the comb is removed thoroughly and neem oil is applied at the site of attachment of the comb. The disturbed bees quit that place within 48 hours.

### **Benefits**

- The method is both ecofriendly and bee friendly and helps in driving out the bees without killing them.
- There is no chance for the loss of queen bee during the operation.
- The worker bees also fly out from the comb and do not die.
- Hence this method is helpful in the conservation of rock bees which are the important pollinators helping to improve the crop productivity

### **Economics**

- The cost of the equipment is Rs.1500/-

### **Scientists responsible for release**

- M.Muthuraman

## 8. AONLA BASED MOUTH FRESHENER

### Details of Technology

- Select matured, firm and fibreless aonla fruits and wash in cold water. Deseed the fruits with aonla deseeder and slice into small pieces with vegetable slicer. Weigh the desired spice combinations and mix with aonla pieces. Soak it for 48 hrs, mix once or twice during curing.
  - i. Aonla + lime + salt (Aonla 100 g, lime juice 15 %, salt 5%)
  - ii. Aonla + ginger + salt (Aonla 100 g, ginger 5 %, salt 5%)
  - iii. Aonla + pepper + salt (Aonla 100 g, pepper 5 %, salt 5%)
  - iv. Aonla+ lime + ginger + salt (aonla 100g, lime juice 15%, ginger 5%, salt 5%)
  - v. Aonla + lime + pepper +salt(Aonla 100 g, lime juice 15%, pepper 5%, salt 5%)
  - vi. Aonla + pepper + ginger + salt (aonla 100 g, pepper and ginger 5%, salt 5%)
  - vii. Aonla + pepper + ginger + lime + salt (aonla 100 g, pepper 3%, ginger 3%, lime juice 15, salt 5%)
- Dry it in a cabinet drier at 60 to 80°C for 4 to 5 hrs. Pack it and store in an airtight container.

### Benefits

- Value addition of aonla will increase the production and the economic value of the crop among the farmers
- Dehydrated aonla supari will be the good substitute for chewing areca nut and tobacco and it will help to maintain the health profile
- Processing of aonla will lead to additional income for growers and entrepreneurs

### Economics

- Cost of production : Rs.50/kg

### Scientists responsible for release

- Saraswathy Eswaran, D.Malathi and G.Puspha