

# ABOUT THE REGIONAL STATION



**CENTRAL PLANTATION CROPS RESEARCH INSTITUTE  
REGIONAL STATION, VITTAL - 574 243  
KARNATAKA**

## The Setting

**Central Plantation Crops Research Institute, Regional Station** at Vittal came into existence in 1970, with a mandate to carry out research on arecanut and cocoa crops. The efforts in this direction started as early as 1947 through the establishment of ad-hoc arecanut committee by ICAR to study the problems of arecanut industry. The committee started a research station at Vittal, which gave a firm foundation for arecanut research by establishing the Central Arecanut Research Station (CARS) at Vittal in 1956. Consequent to the establishment of the CPCRI in 1970, the CARS became the Regional Station of the Institute. The Vittal Station lies in the heart of major arecanut growing areas of the country. Vittal is located in Bantwal taluk of Dakshina Kannada district, 48 km away from Mangalore on the Mangalore-Vittal-Puttur road. It lies on 12°15N latitude and 75°25E longitude.

|                          |   |
|--------------------------|---|
| <b>Area</b>              | : 68.34ha   |
| <b>Altitude</b>          | : 73-92m above MSL  |
| <b>Soil</b>              | : Laterite admixed with sand and alluvium with a pH 5.25  |
| <b>Climate</b>           | : Hot and humid with annual rainfall 3700 mm distributed over 120 days during south west monsoon from June-September. |
| <b>Max. Temperature</b>  | : 28-36°C   |
| <b>Min. Temperature</b>  | : 19-24°C   |
| <b>Average Rainfall</b>  | : 3670 mm   |
| <b>Agroclimatic zone</b> | : 12 (West coast plains and Ghats)  |

The Regional Station is under the administrative control of the Director, CPCRI, Kasaragod and is managed by the Head. The Station has a staff strength of 18 Scientists, 26 technical staff, 13 administration staff and 80 supporting staff.

### Mandate of the Regional Station

- To develop appropriate production, protection and processing technologies for arecanut and cocoa.
- Production of parental lines and breeders stock.
- To develop arecanut based farming systems.
- Transfer of technologies to developmental agencies.



## Infrastructure

The research station over the years has built infrastructure facilities with modern equipments for carrying out the research work.

## Library

Has collection of 5323 books, 5104 back volumes and 2207 other documents. The Station subscribes to 33 Indian and 9 foreign Journals.

## Accomplishments

### Crop Improvement



Mohitnagar variety

- The Vittal Station maintains field genebank comprising 128 accessions (23 exotic and 105 indigenous) in arecanut and 137 accessions (113 exotic and 24 indigenous) in cocoa.
- Descriptors on 36 accessions of areca palm was prepared based on 17 morphological and 18 reproductive characters.
- Four high yielding varieties viz., Mangala, Sumangala, Sreemangala and Mohitnagar with 2.02, 3.28, 3.10 and 3.67 kg chali/palm respectively have been released for cultivation.

- Hirehalli dwarf, a dwarf mutant of arecanut has been utilised in hybridization programme for developing dwarf hybrids at this Station, and the hybrids, Mohitnagar × H. Dwarf and H. Dwarf × Sumangala have shown promising results.

- Cocoa has been evaluated under four progeny trials. Clones Na 242 × ICS 95 and NC 45/5 from Lalbagh and Nigerian clones performed better. In progeny trials, Na33 × ICS 89, SCA6 ×



Dwarf hybrid H.Dwarf × Sumangala

IMC 69 in progeny trial-I, I-56 × II-67, I-14 × I-56, I-56 × III-35 in progeny trial-II, ICS 6 × SCA 6, Amel × Na-33 in progeny trial III and



II-67 × NC 42/94 and II-67 × NC 29/66 in progeny trial-IV gave better performance.

- Soft wood grafting has been successfully adopted for producing cocoa grafts.

### Crop Production

- Agrotechniques for arecanut such as spacing (2.7 m × 2.7 m), fertiliser dose (100 : 40 : 140g : N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O respectively+20 kg FYM), irrigation of 30 mm water at 30 mm pan evaporation have been standardised.
- Arecanut varieties in the recent trial responded positively to higher fertiliser doses upto 200 : 80 : 240 g of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O/palm/year. From economic point of view, it is financially feasible to apply the above dose as it has resulted in higher benefit-cost ratio of 4.25, while no fertilizer resulted in only 2.52 benefit-cost ratio.
- Agronomic trials have shown the profitability of growing cocoa at a spacing of 2.7m × 5.4m in arecanut gardens as a mixed crop.

- In cocoa, a fertiliser dose of 100 : 40 : 140g NPK/tree/year with 20 litres water/day/tree was found to be suitable. This combination of fertilizer and irrigation has given 1002 kg dry bean/ha/year.

- Use of vermicompost for boosting the productivity of arecanut is under progress at this Station.





- Technology for production of oyster mushroom (*Pleurotus sajor caju*) from areca leaf sheath has been standardised.



- The high density multispecies cropping system involving arecanut, banana, pepper and cocoa had resulted in a higher net return of almost 85 to 100% over arecanut monocrop system. There was also efficient use of resources like light, nutrients and soil surface. This cropping system gives higher net profit of around Rs. 2,69,000 per ha over arecanut monocrop (Rs. 1,00,000 per ha).

### Plant Physiology & Biochemistry

- Nigerian cocoa accessions NC 42/94, NC 23/43 and NC 29/66 have got drought tolerance. The hybrid combinations viz, I-21 × NC 42/94 and I-29 × NC 23/43 recorded tolerance for drought based on physiological and biochemical parameters.
- In the pruning trial, cocoa bean yield increased with canopy size; maximum yield was recorded in 2.7m × 5.4m spacing and large canopy (16.56 m<sup>2</sup>)
- Comparative physiology of apparently healthy and Yellow Leaf Disease arecanut palms revealed that diseased leaves had higher stomatal resistance, lowered photosynthesis and transpiration. Chlorophyll fluorescence parameters were also affected which reduced quantum yield.



### Crop Protection

- Yellow leaf disease is a disease affecting areca palms. The disease is characterised by interveinal foliar yellowing commencing from the tip of

leaflets of the outer whorl followed by necrosis at later stages. The disease is caused by Phytoplasma and transmitted through *Proutista moesta* (insect vector). The strategy for disease management includes adopting recommended management practices; removal of diseased palms to prevent spread of the disease; identifying disease tolerant palms and utilizing in hybridization programmes.

- Spraying of Bordeaux mixture (1%) and copper oxychloride (0.3%) at monthly intervals to the pods along with destruction of infested pods was found to control Black Pod Disease in cocoa, caused by *Phytophthora palmivora*.

- In arecanut based cropping system, involving arecanut, cocoa and black pepper, *Phytophthora* incidence was found to be host specific and there was no spread of disease to other crops in the system.

- A field trial to control fruit rot in arecanut showed that polythene covering (125-200 gauge 24 × 30 inches) can as well substitute the traditional method of spraying Bordeaux mixture (1%) for effective management of Koleroga in arecanut, which is caused by *Phytophthora arecae*.



- Incidence of scale insects *Aonidiella orientalis* (Newstead) has been reported in Kasaragod and Dakshina Kannada districts. Natural predators of scale insects viz., Coccinellid beetles and 2 species of predaceous thrips of the family *Phloethripidae*, *Aleurodothrips* and *Podothrip sp* were noticed.
- Root grubs, *Leucopholis burmeisteri* can be controlled by application of Phorate (Thimet) at 15 g/palm to the soil. Two natural enemies of white grub viz., *Fusarium sp* and *Aspergillus flavus* were recovered from the infested palms.
- The Spindle bug (*Carvalhoia arecae*) can be controlled by placement of 2g Phorate granules in polythene sachets in the crown.



■ The Pentatomid bug (*Halyomorpha marmorea*), which caused tender nut drop can be controlled by spraying Endosulfan (0.05%) or Fenvalerate (0.02%).

■ Mites (*Raoiella indica* Hirst and *Oligonychus indicus* Hirst) can be controlled by spraying dicofol (Kelthane) 2 ml/lit. of water or dimethoate (Rogar 30 EC) 1.5ml/lit of water. Repeat the spray at an interval of 15-20 days if there is recurrence of pest.



### Transfer of Technology

The ultimate goal of the research activities conducted at this Station is to disseminate the research results to farming community and extension agencies. This is done through conducting training programmes on areca and cocoa production technology and dissemination of information through radio talks. Extension literature in the form of folders and pamphlets are brought out. Besides, this station also participates in Krishi exhibitions and agricultural seminars. The Station produces quality planting materials of arecanut and cocoa grafts and F<sub>1</sub> cocoa seedlings for supply to farmers, State Agriculture Departments and Research Centres.

### Future Thrust

The thrust areas of research for the future include collection and addition to the germplasm holding in both arecanut and cocoa, exploitation of dwarfness in arecanut development of dwarf as well as varietal hybrids, production of elite planting material, integrated management of *Phytophthora* disease, drought tolerance in cocoa, fertigation, water management through drip irrigation, organic farming, vermicompost and on farm research. An integrated management of yellow leaf disease affected arecanut and screening for disease tolerant palms in hot spot areas with a view to develop suitable hybrids will receive top priority in future research. Product

diversification and alternate uses of arecanut and its byproducts are necessary for stability in arecanut prices.



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Extension Publication No. 63 (October, 1999)

Published by: K.U.K. Nampoothiri, Director, CPCRI, Kasaragod - 671 124

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Photo credits: K. Shyama Prasad