

## INCREASING PRODUCTIVITY OF CARDAMOM THROUGH LARGE SCALE DEMONSTRATION OF IMPROVED TECHNOLOGY IN FARMERS FIELDS IN KODAGU DISTRICT OF KARNATAKA

V. S. KORIKANTHIMATH, M. N. VENUGOPAL, R. NAIDU<sup>1</sup>  
and A. K. SADANANDAN<sup>2</sup>

*National Research Centre for Spices, Cardamom Research Centre, Appangala, Heravanad, Madikeri 571 201  
Kodagu, Karnataka, India*

### ABSTRACT

A High Production Technology (HPT) programme was initiated in 1986 in all the key cardamom growing zones of Kodagu district in Karnataka to motivate the growers to increase the per unit production to a level of 650 kg per ha by utilising the information available at the Cardamom Research Centre, Appangala, in collaboration with Spices Board. A series of meetings were held in various field units to enlighten planters for adoption of the HPT programme. Totally 42 farmers were selected covering an area of 94.10 ha by planting 4,70,500 CI-37 seedlings. The preplanting status survey of the HPT cardamom plantations revealed that the yield level ranged from as low as 10 to as high as 125 kg/ha, with the average being 58.0 kg/ha. The establishment of cardamom in all the plots is quite satisfactory (95%). The plots were monitored from time to time by implementing the package of practices as per calendar of operations.

### INTRODUCTION

In the recent years, India has lost its near monopoly in world production as well as export of cardamom and has been replaced from some of the traditional markets through intensive competition from Guatemala (Das, 1982). The national average yield of Indian cardamom is only 60 kg/ha as against 350 kg/ha in Guatemala, mainly because 75 to 80 per cent of cardamom area in India faces long dry spells and grown under poor management. Significant decline in growth rate in production of cardamom was recorded in the years 1972-73, 1976-77 and 1982-83 due to drought prevailed during summer (Anonymous, 1984; Cheriankunju, 1985; Mohanachandran, 1983). The projec-

tions of the Spices Board, show that the gap between world supply and demand may touch 5000 tonnes by the year 2000 AD (Chandrasekhar, 1987). Although almost 60 per cent of the produce is exported to more than 60 countries, there is a great scope and need for increasing cardamom production in India which is known for its quality and aroma. As the international market becomes increasingly competitive only high productivity and low cost of production would ensure survival of this industry. At the National Research Centre for Spices, Cardamom Research Centre, Appangala, Kodagu, Karnataka, and its demonstration plots in the farmers fields examples were set to tap a better crop potential of 650 kg/ha

<sup>1</sup> *Indian Cardamom Research Institute, Myladumpara, Kallisanadu 685 553, Idukki, Kerala*

<sup>2</sup> *National Research Centre for Spices, Kozhikkode 673 012, Kerala*

under irrigated and 162 kg/ha in rainfed condition respectively (average of 3 years). In the above trials it was evident that the increased yield was due to use of high yielding planting material, quality seedlings, high plant population, judicious shade regulation, timely cultural practices, fertilizer and pesticide application and 'Katte' disease management. This success lead the scientists and Spices Board, to work out a feasible strategy to improve the present low production of cardamom in India and narrow down the gaps between actual and the potential yield. In view of the above background a high productivity technology programme was launched in all the major cardamom growing areas of Kodagu and parts of Hassan district which comprises 68% of total area in Karnataka and 20% in India, to demonstrate the high yield potential of cardamom in the farmer's fields.

#### METHODOLOGY

In the joint meetings of the Scientists and officials of the Spices Board, various constraints were discussed and was decided to launch a programme in all the key cardamom growing zones in 1986 to motivate growers to adopt improved techniques for increasing production per unit area, by utilising the information generated already. It is a collaborative programme of NRCS, Cardamom Research Centre, Appangala and the Spices Board, wherein the role of former is to motivate growers and to offer overall technical guidance. All the monetary inputs by way of subsidy etc. were met by Spices Board.

The package of practices, for HPT both under irrigated and rainfed conditions and calendar of operations (Annexure I) were prepared before initiating the programme.

The sequence of works carried out for implementation of the programme were as follows :

1. Training the officials of Spices Board at all levels.
- (2) Motivation of farmers
- (3) Arranging visit of farmers to the Cardamom Research Centre
- (4) Identification of beneficiaries
- (5) Preplanting inspection
- (6) Training of Extension/Field Assistants
- (7) Collection of information on preplanting history of HPT and regular follow up and
- (8) Monitoring of HPT plots.

An Evaluation committee was constituted for monitoring HPT plots in Karnataka with the Deputy Director, Spices Board, Sakleshpur as convener and Scientist-in-Charge of NRCS, Cardamom Research Centre, Appangala, RRS Mudigere and ICRI Sub-Station, Sakleshpur as members to review the progress of work and suggest corrective measures if required.

#### RESULTS AND DISCUSSION

Totally 42 plantations located in the various agro-ecological conditions and rainfall pattern in 5 zones viz., Virajpet (13), Bhagamandala (7), Madikeri (12), Somwarpet (2) and Yeslur (8) were selected (Table I).

The data collected on the preplanting benchmark survey of HPT cardamom plantations revealed that the yield level ranged from as low as 10 to as high as 125 kg/ha, with the average being 58.80 kg/ha, which is almost equivalent to national average yield (62 kg/ha) (Mohanachandran, 1984). The average size of the families selected under the HPT programme was 6.55 with an area of 6.54 ha. The average age of the plantations was 16.98 years before adopting the High Productivity Technology. The mean rainfall in all the units was found to be 3150.5mm per annum. The Bhagamandala unit recorded the highest rainfall of 4197.1mm followed by Virajpet (3808.00 mm), Madikeri (2729.1 mm),

Table 1. Status of cardamom plantations before initiating HPT

Name of the unit	Size of the family	Average annual rainfall in mm	Area under cardamom in ha	Age of plantation in years	Previous average yield kg/ha
Bhagamandala	9.42	4197.1	11.80	25.33	32.50
Madikeri	6.91	2729.16	6.6	14.29	73.55
Somwarpet	5.00	2600.00	2.4	10.50	80.00
Virajpet	4.18	3807.69	7.94	12.18	41.81
Yeslur	7.25	2518.75	4.00	22.62	66.16
Average	6.55	3150.54	6.54	16.98	58.80

Somwarpet (2600.00 mm) and Yeslur (2518 mm) respectively. It is interesting to note that the lowest average yield of 32.50 kg/ha was recorded under the heaviest rainfall of 4197.1 mm followed by Virajpet with 41.81 kg/ha (3807.69 mm). The yield of cardamom is influenced more by distribution of monthly rainfall than the total rainfall (Subba Rao and Korikanthimath, 1983). The planting of cardamom in all the 42 HPT demonstration plots was taken up during the planting year of 1986 and the establishment of cardamom seedlings was 94.88%.

The performance of cardamom was quite satisfactory in almost all the HPT demonstration plots and the first crop is expected during 1988 crop season two years after planting. The fluctuating market, recurring drought, rise in the cost of labour and other inputs are adversely affecting the cultivation of cardamom. The good crop prospects just two years after planting in the HPT plots as against 3-4 years in the normal conditions, is an added advantage and due to this advantage many are voluntarily adopting the HPT system in their plantations.

### Annexure I

#### Package of Practices for High Production Technology Programme of Cardamom in Karnataka Region

##### 1. Planting material

Nursery raised from quality seeds of Malabar Variety.

##### 2. Spacing

*Uplands:* 2 x 1 M spacing accommodating about 5000 plants per hectare.

*In low lying lands/flat lands:* 2.1 x 1.2 m accommodating about 3,960 plants per hectare. Drainage should be ensured to avoid water stagnation.

##### 3. Method of planting

*Uplands:* Trench method of planting on contours. Trenches of size 45 cm width, 30 cm depth and convenient length are to be opened during March-April after receipt of summer showers.

*In low lying/flat lands and under irrigated conditions:* Individual pits of size 45 cms x 45 cms x 30 cms to be filled with top soil and organic manure before planting.

##### 4. Planting time

*Uplands:* Planting during May-June with onset of monsoon.

*Low lying lands:* Planting during August onwards after the heavy monsoon. Proper staking and mulching should be taken up.

### 5. Fertilizer dose

*Rainfed condition:* For both uplands and low lying/flat lands—fertilizer to be applied @ 125:125:250 kg. NPK/ha (5000 plants). Under irrigated condition higher dose is recommended, based on the location and soil test values.

*1st year of planting:* Half the dose of fertilizer is given. 1st round of fertilizer to be given after 45 days and 2nd round after three months of planting.

*2nd year of planting:* The full dose of fertilizer to be given in 2 or more split doses depending on soil moisture availability.

### 6. Other cultural operations

Light forking to break the hard surface of soil during 1st year *i.e.*, October–November and mulching during summer months.

### 7. Weeding

Regular weeding to be carried out depending on weed growth.

### 8. Shade regulation

*Irrigated conditions:* Minimum with 60–70% of filtered sunlight depending on slope and direction.

*Rainfed condition:* Shade is to be adjusted to obtain filtered sunlight particularly in Western and Southern aspects.

### 9. Plant protection

*1st year of planting:* Two rounds of 1% Bordeaux mixture with a suitable contact insecticide. 1st round after planting and 2nd round during April/May.

*2nd year of planting:* In addition to above one more round of dusting with insecticide(s) depending upon pest infestation.

Additional plant protection measures will be suggested depending on the outbreak of particular pest and diseases.

### Calendar of operations in the HPT cardamom plots in Karnataka

#### January

1. Irrigation at an interval of 12–15 days.
2. Tracing and roguing of 'Katte' infected plants.

#### February

1. Continuation of irrigation as above
2. Collection of soil samples for testing
3. Tracing and roguing of 'Katte' infected plants.

#### March

1. Continuation of irrigation as above
2. Tracing and roguing of 'Katte' infected plants.

#### April

1. Continuation of irrigation as above.
2. Regulation of shade after the receipt of premonsoon showers.
3. Spraying 1% Bordeaux mixture and the insecticides in the irrigated areas.
4. Tracing and roguing of 'Katte' infected plants.

#### May

1. Continuation of irrigation till sufficient rain is received.
2. Trashing.
3. Application of insecticides against thrips infestation.
4. Demulching to facilitate pollination by honey bees.
5. Regulation of shade to a height of 8–10m to get filtered sunlight.
6. Application of 62.5:62.5:125 Kg NPK/ha.
7. Opening and filling of pits/trenches.

8. Tracing and roguing of 'Katte' infected plants.
9. Weeding.

#### June

1. Gap filling by using 18-22 month old seedlings.
2. Application of fertilizer (if not attended during May).
3. Spraying with 1% Bordeaux mixture.
4. Cleaning the drains to provide adequate drainage.
5. Continuation of weeding.
6. Planting the saplings of fast growing shade tree species in the vacant and open areas.

#### July

1. Cleaning and deepening the drains (Wherever necessary) to ensure adequate drainage.
2. Harvesting of cardamom in the valley bottoms.

#### August

1. Continuation of picking at an interval of 12-15 days.

#### September

1. Continuation of picking.
2. Spraying 1% Bordeaux mixture against rhizome and panicle rot.
3. Application of 62.5:62.5:125 Kg NPK/ha.

#### October

1. Continuation of picking.
2. Light earthing up to cover collar region.
3. Mulching.
4. Spraying for red hairy caterpillars with the recommended insecticides.
5. Tracing and roguing of 'Katte' infected plants.

#### November

1. Continuation of picking cardamom
2. Continuation of mulching
3. Cleaning and rectification of drains
4. Tracing and roguing of 'Katte' infected plants.

#### December

1. Continuation of picking cardamom
2. Continuation of mulching
3. Tracing and roguing of 'Katte' infected plants.

Keeping upto date records of the various farm inputs and mandays used for entire year.

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