

## CULTIVATION PRACTICES OF CARDAOM IN KERALA

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### *Abstract*

*The civilized nations of the world have visualized that India since time immemorial as the home of spices. The spices ranked with valuable stones in the inventory of royal belongings. This proved incentive for the discovery of new waterways to the land of spices. In ancient days spices were valued as basic ingredients of cookery, preservatives, ointments, perfumes, cosmetics and medicines. So the international trade between India and the rest of the world thrived with the efforts of Greeks, Phoenicians and Arabs in the early periods and their main objectives of exploration was nothing but the spices. Thus it goes without saying that it was only in the attempt of exploring the coast of Malabar that Colombus discovered America. In the later periods, the mystery surrounding the source of spices was revealed to Egyptians which enabled them to enter into the field of spice trade.*

**Keywords:** Spices, Cardamom, Channels, Cultivation, Marketing.

### **Cardamom**

The name cardamom is used for spices within three genera in the Ginger family (Zingiberaceae), Elettaria, Amomum and Aframomum. Among these, Aframomum is widely cultivated in Africa and Madagascar, whereas Amomum mainly grows in a few places of Asia and Australia. These two varieties are considered as inferior substitutes for Elettaria cardamom, the true cardamom that is distributed from India to western Malaysia.

For the purpose of present study the Elettaria cardamom, which is also known as Small cardamom, Green cardamom, or cardamon is considered. In India it is popularly known as elaichi. The cardamom of commerce is the dried fruit (capsule) of the plant,

Elettaria cardamom Maton. The genus belongs to the natural order Scitamine, family Zingiberaceae under Monocotyledons. It is native to the moist forest of southern India, Sri Lanka, Malaysia and Sumatra, Nepal,

Guatemala, Thailand, Central America, Indo China, Tanzania, Egypt, China, Indonesia, Mexico, Turkey, Laos, Vietnam, Costa Rica, El Salvador and Brazil.

### Uses of Cardamom

Cardamom is a multitalented and widely used spice. It encompasses variety of uses.

- Cardamom is used in adding flavours in both foods and drinks.
- Cardamom is used as cooking spice.
- Cardamom is therapeutic in nature, broadly used to treat infections in teeth and gums, digestive disorders, throat troubles, skin conditions etc. It is considered beneficial in the treatment of sexual dysfunction like impotence and premature ejaculation.
- Oil of cardamom is used in processed foods, tonics, liquor and perfumes.
- In South Asia, green cardamom is largely included in traditional Indian sweets and in the making of tea.
- In Arabia, Cardamom is used in the preparation of 'gahwa'- a strong cardamom coffee, which shows hospitality among Arabs.
- In Northern Europe, cardamom is an essential ingredient in sweet foods.

### Global Scenario

Guatemala, India, Srilanka, Tanzania, El Salvador, Vietnam, Laos, Cambodia and Papua New Guinea are the major cardamom growing countries. The world production of cardamom is around 36000 tonnes /annum. Guatemala with a production of 23000 tonnes is the largest producer of cardamom followed by India and Tanzania. The major cardamom exporting countries are Guatemala, India and Indonesia. The major consuming countries of cardamom are West Asian countries, Pakistan, Scandinavian & European countries, USA and Japan. The West Asian countries have the maximum consumption with only India, UAE

and Saudi Arabia accounting for 60% of the consumption followed by Denmark, Finland, Norway, Iceland accounting for 16% and Japan and USA, each accounting for 2.5 % each. The major importing countries include Saudi Arabia, Kuwait, UAE, China, Japan, Honk Kong, Netherlands, Singapore and USA.

### Cardamom Plantation in Kerala

Cardamom cultivation in India is mainly confined to three states, namely Kerala, Karnataka and Tamil Nadu. It is a pungent aromatic spice and medicinal herb. It is a perennial plant that can grow between six and twelve feet height. Cardamom grows well in humid and moderately cool climate, filtered sunlight through the tree canopy, humus rich soil, well-distributed rainfall and protection from heavy winds. The modern history of cardamom plantations in Kerala starts only from the late 19th century. Kerala was known as the land of cardamom plantation of the Eastern Region. It was because, cardamom, the grain of paradise is indigenous to the ever green forests of Western Ghats in Kerala. Upto the year 1896 cardamom was the monopoly of the state. The cultivation of cardamom was actively encouraged by the Travancore Government in 1823 during which special cardamom staff was attached to the forest department with its head quarters at Thodupuzha. In 1869 the cardamom office was severed from the forest department and was given to a state official with the powers of First Class Magistrate stationed at Udupanchola. This enabled to open the Makaram Elam Tract by cutting rough paths in all directions and thus paved way for the despatch of cardamom produce to Kottayam by bullock-carts and from there to Alleppey by boats. Moreover, during the period from 1849 to 1896, a Nayar Brigade was set up every year to guard the cardamom plantations and to prevent the smuggling of the produce.

## Cultivation Practices of Cardamom in Kerala

Cardamom is propagated through seeds, suckers and tissue culture plantlets. Cardamom plants mature in about 20-22 months after planting. Economic yield starts from 3rd year of planting and it continues up to 10-14 years for high yielding varieties depending upon the level of management. The life span of a cardamom plant is 20 years or more, but each pseudostem is biannual in nature.

### Varieties of Cardamom

There are so many varieties of cardamoms are available, Mysore, Malabar and Vazhukka are very famous among them. These types were grown in different tracts and were mostly identified on the nature of panicles, size of plants and other morphological characters. Cardamom varieties were highly location specific.

**Table – 1 – Varieties of cardamom**

	Malabar	Mysore	Vazhukka
Elevation of planting	600-900m	900-1350m	800-1300m
Fruiting branches (panicles)	Prostrate	Erect	Semi erect
Capsule	Round	Elongated	Elongated
Leaf under surface	Silky	Coarsc	Coarsc
Height	2.5-3.0m	3.5-4.5m	3.5-4.5m

Source: Spices Board

### Plant Characteristics

The natural habitat of cardamom is the evergreen forests of Western Ghats. Though considerable variations both in the total rainfall pattern and its distributions are noticed in the cardamom tracts (900-4000mm), a well distributed rainfall of 1500-2500mm with not less than 200mm summer is experienced. Cardamom is generally grown in forest loam soils rich in available phosphorus and potassium. The crop is raised mainly on well drained, deep, good textured soils rich in humus

### Crop Management

In order to raise a cardamom plantation, suckers or seedlings of high yielding varieties suitable to the location are to be used. If virus

free production of planting material could be ensured, vegetative propagation through suckers is the best method. However, vegetative propagation has the inherent disadvantage of reducing the genetic base of cardamom. Sucker propagation is the accepted practice in Kerala and Tamilnadu. Traditionally, cardamom plantations were raised from seeds. It is still the common and advisable practice in Karnataka mainly because of the rampant virus disease infestation.

### Nursery

Ripe capsules of the desired cultivar are collected from high yielding plants during September-October. The seeds are extracted by gently pressing the capsules. In order to increase the germination percentage, seeds can be treated with concentrated sulfuric acid or nitric acid for not more than two minutes. The extracted seeds are washed in cold water four times to remove the mucilaginous coating. The washed seeds are drained and mixed with ash and allowed to dry in shade for 2 or 3 days. The seeds should be sown in the nursery within a fortnight. Sowing in September is the best for high germination. Sowing during southwest monsoon and winter should be avoided.

When it becomes necessary to store the seeds, it is advisable to store them in capsule form. It can be preserved in this form for one month, without deterioration of viability. Polythene lined gunny bags can be used for this. In Kerala and Tamil Nadu, 18 month old seedlings are used for planting. The seeds are sown in primary nursery from where the young seedlings are transplanted to a secondary nursery and maintained for one year before planting in the main field.

### Primary nursery

The nursery site is selected in open, well-drained areas, near a source of water. The land is dug to a depth of 30 cm, cleared of all stubbles and stones; and clods are broken. Beds of size 6 x 1 x 0.3 m are then prepared. Jungle

soil is spread in a thin layer over the nursery bed. Seeds are sown on the bed in lines. For an area of 1 m<sup>2</sup>, 10 g of seed is required. Sixty grams of seeds will be required for a nursery bed of 6 m<sup>2</sup>. The seeds are covered with a very thin layer of fine soil. The nursery bed is mulched with dry grass. Potha grass (*Grenetia stricta*) commonly seen in high range areas is a suitable material for this purpose. Grass is spread to a thickness of about 2 cm. Paddy straw can also be used for mulching. After sowing, beds have to be watered every day in the morning and evening. The mulch should be removed on commencement of germination. The seedlings have to be protected by providing shade pandals. Regular watering, weeding and protection from pests and diseases are to be attended to. During June-July, seedlings from the primary nursery are transplanted to the secondary nursery.

#### **Secondary nursery**

After preparing the site properly, form nursery beds of 6 x 1 x 0.3 m. Mixing of well decomposed cattle manure and wood ash with the top layer of the soil will help the seedlings to establish well and to grow vigorously. During June-July, the seedlings from the primary nursery are transplanted at a spacing of 25-30 cm. Shade pandals should be provided before transplanting. Overhead pandals or individual pandals for each bed may be erected. Mulching the bed with dry leaves will help to conserve soil moisture. Regular watering during dry months, weeding, application of fertilizers, control of pests and diseases and mulching are the essential operations for the maintenance of the secondary nursery. One month before uprooting, the pandal should be removed to encourage better tillering.

#### **Soil treatment in nursery**

It is recommended that the primary and secondary nursery soil may be drenched with formalin 2% solution and covered with polythene sheets for 3 days. Planting should

be taken up only 15 days after treatment to avoid phytotoxicity.

#### **Shade**

Since inadequate as well as excessive levels of shade are harmful to the crop, regulation of shade is inevitable. There should be sufficient shade to protect cardamom plant during the hot season. By regulating the shade before the monsoon, more light becomes available to the plant during the rainy season. Red cedar or chandana-vempu (*Toona ciliata*) is an ideal shade tree. It sheds the leaves during rainy season and thus provides natural shade regulation. Some of the other shade trees are kurangatti (*Acrocarpus fraxinifolius*), vellakil (*Dysoxylum malabaricum*) and thelli (*Canarium strictum*).

#### **Propagation**

Cardamom can be propagated vegetatively and by seedlings. For vegetative propagation, rhizomes with not less than three shoots are used. Plants propagated vegetatively come to bearing one year earlier than the seedling-propagated plants. But this method has the disadvantage of spreading the 'katte' disease, which is of viral origin. This disease is not transmitted through seeds. Hence in areas where the disease is widespread, it would be safer to use seedlings for propagation.

#### **Main field planting**

Cardamom plantation is raised in forests under the shade of tall trees. For raising a new cardamom plantation, the undergrowth of bushes is cleared. When open areas like marshy valleys and grasslands are selected for raising new plantation, shade trees have to be raised before planting cardamom seedlings. The quick growing shade trees like dadap (*Erythrina lithosperma*) is generally used for this purpose. Cuttings of this tree are used for planting. But this tree is a host of root knot nematode, which infests cardamom. Other quick growing trees like Albizia can also be used. Useful trees like jack and eucalyptus can

be used along with red cedar, wild nutmeg, kurangatti etc.

### Spacing

Mysore and Vazhukka: 2 x 2 m to 3 x 2 m depending on the fertility of the soil Malabar: 1.5 x 1.5 m to 2 x 2 m depending on the fertility of the soil. The recommended size of pits is 60 x 60 x 35 cm. The pits are filled with rich topsoil at least two months in advance of planting the seedlings. Application of well decomposed FYM or compost or leaf mould and 100 g of rock phosphate with the topsoil in the pit will help in proper establishment and quick growth of plants. If the selected site is a hill slope, terraces may be formed before digging pits. Planting can be done with the commencement of southwest monsoon, before the heavy rains. A small pit may be formed inside the pit by scooping out soil at the centre of the pit for planting seedlings. The soil may be put just to cover the rhizomes. Care should be taken to ensure that the rhizomes do not go deep into the soil.

### Cultural operations

A regular schedule of cultural practices consisting weeding, mulching, trashing, shade regulation, fertilizer application, irrigation, etc. will have to be undertaken. Sufficient mulch should be applied at the base of the plant during December to reduce the ill effects of drought during summer months and to conserve soil moisture. Sickle weeding is essential which has to be carried out frequently depending upon the intensity of weeds. Forking is necessary in hard soils, which is to be carried out in October-November. Trashing (removal of old and dried shoots, leaves and dried panicles) should be taken up once in a year during June-July, with the commencement of monsoon. This will help to prevent the spread of diseases and expose the panicles to easy visit by honeybees. Soil conservation measures, maintenance of drainage channels and such other operations may be taken up promptly.

Bee-keeping for better pollination The main pollination agent in cardamom is honeybee (*Apis cerana indica*). Maintaining four bee colonies per hectare during the flowering season is recommended for increasing fruit set and production of capsules.

### Manures and Fertilizer application

Cardamom responds to both manuring and fertilizer application. A soil test with judicious manuring schedule is to be arrived at to achieve optimum production on sustainable basis. Long term manuring studies that are being carried out at ICRI, Myladumpara indicate that an integrated nutrient application is beneficial for sustainable production in cardamom.

### Application of Organic Manures

Application of mature farmyard manure/ Compost @ 5-10Kg per plant may be made during May/June along with rock phosphate (180 grams per plant) and muriate of potash (90 grams/plant). The manures should be thoroughly mixed with surface soil after application. Under irrigated condition, manuring can be done in two splits, one in May and the subsequent application during September. Organic manures such as neemcake (one kg per plant), bone meal (one kg per plant) or vermicompost (one kg per plant) provided beneficial effect on root proliferation and plant growth and also helps to reduce nematode and root grub infestation. Under high production technology, where crop is harvested from 18 months onwards, fertilizer recommendation for full-grown plantation could be adopted from the second year onwards. Fertilisers would be applied in smaller doses in four or more splits after every harvest or combining both soil and foliar application of fertilisers. Whenever, the plant growth is affected due to root damage (root grub/fusarium disease/soil compactness), foliar application of DAP (two per cent) + MOP (two per cent) could be adopted. Fertilizer application on disease infected plants

should be restrained.

### Fertilizer application

Recommended mixture - 700 kg / ha/yr at the density of 2000 plants/ha

Table – 2

Components of the mixture	Parts by weight	Nutrient in the mixture
Urea (46%N)	4	16%N
Rock phosphate ( 28 % P <sub>2</sub> O <sub>5</sub> )	4	10% P <sub>2</sub> O <sub>5</sub>
Muriate of potash (60% K <sub>2</sub> O)	2	11% K <sub>2</sub> O
Kieserite (24%MgO)	1	2%MgO

Source: Spices Board

### Conclusion

In the industry of spices especially for cardamom, cultivation and marketing practices play a crucial role which forms a prerequisite

for the development in other sectors and for the overall development of the economy. Kerala is having well in humid and moderately cool climate; filtered sunlight through the tree canopy, humus rich soil, well distributed rainfall and protection from heavy winds which is very conducive for the cultivation of cardamom. Kerala is the maximum contributor of cardamom out of India's total production. Marketing of cardamom are defined as the operations involved in the movement of food and raw materials from the planters to the final consumers. In our country, there exists an elaborate and inter connected system of spices markets through which the produce flows from the producer to the consumer in India.

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