

Production Technology of Large Cardamom (*Amomum subulatum* Roxb) for Anjaw district of Arunachal Pradesh

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INTRODUCTION:

Large cardamom (*Amomum subulatum* Roxb), is a perennial herbaceous spice belonging to the family Zingiberaceae. The crop is the lifeline for the inhabitants of Anjaw district of Arunachal Pradesh, situated in the extreme eastern most corner of the country touching international boundaries with China. The district is blessed with semi evergreen forests and humid subtropical climate choosing it as an ideal habitat for large cardamom cultivation. It is also widely grown in Upper Siang, East Siang, Upper Subansiri, Lower Subansiri and other mountainous parts of Arunachal Pradesh. It is a shade loving plant (Sciophyte) grown at an altitude ranging from 900-2000 amsl with 3000-3500 mm/year rainfall spread for 200 days. The plant is a perennial herb with subterranean rhizomes with leafy shoots. Stem is a pseudo stem which is called tiller. Inflorescence is spike. Usually, 30 to 40 flowers are observed in a spike. Flowers are yellow, bisexual, zygomorphic and pollinated by bumble bees. There are three petals with a labellum which is mainly for attracting insects for pollination. Anthesis occurs in the morning hours. Ovary is inferior with ovules in axile placentation, stigma funnel shaped; fruit is a capsule, achenated, maroon in colour with seeds which are whitish in immature stage and dark brown to black in mature stage.

USES:

Large cardamom is mostly used as a spice for culinary purpose and also in several Ayurvedic preparations. It contains 2-3% essential oils, possesses carminative, stomachic, diuretic and cardiac stimulant properties and is also a remedy for throat and respiratory trouble (Gudade et al 2013). It is a high value, low volume and non-perishable spice.

CROP VARIETIES:

The varieties of large cardamom has not yet been proper identified and documented from Anjaw district. But some popular cultivars of large cardamom are Ramsey, Ramla, Sawney, Varlangey, Seremna, Golsey, ICRI Sikkim 1 and ICRI Sikkim from Sikkim. Bebo, Belak, Tali or Taje and Jacker are some of the popularly common names used in Siang District of Arunachal Pradesh.

PROPAGATION:

The most common and quick propagation method is through suckers. Planting materials should be selected from high yielding disease free plantations. The plantation should have high yield record i.e. more than 800 kg / ha for at least 3 consecutive years.

LAND PREPARATION:

The land is properly ploughed to free it from weeds or any unwanted plants. Old large cardamom plants nearby should also be removed. Usually pits of size 30 x 30 x 30 cm are prepared on contours with a spacing of 1.5 x 1.5 m from the centre of the pits. Pits are left open for weathering for a fortnight and then filled with topsoil mixed with cow dung compost / FYM @2-3 kg per pit. Pit making and filling operation should be completed in the third week of May before the onset of pre-monsoon showers.

PLANTING:

Planting is done from April till July during the arrival of monsoon. A mature tiller with 2-3 immature tillers/vegetative buds is used as planting unit. In sloppy areas, large cardamom suckers should be planting in trenches of 45 cm (1½ ft) width and 30 cm (1 ft) depth with convenient length & across the slopes of the field. Suckers/seedlings are planted by scooping a little soil from the centre of the pits and planted up to collar zone. Deep planting should be avoided. Staking is needed to avoid lodging from heavy rain and wind and mulching is done at the plant base to protect from the scorching sun. Deep, loamy texture and well-drained soil with pH 4.5 to 5.5 is best suited.



Large cardamom sucker nursery

APPLICATION OF MANURE:

To obtain sustainable good yield, replenishment of nutrients into the soil is very important. Well decomposed cattle manure/compost or organic products @ 5kg/plant and at least twice in a year in April-May and August-September are beneficial.

WATERING / IRRIGATION:

Large cardamom is a moisture loving plant, which can't thrive water stress conditions. In the first year of planting, at least once in 10 days irrigation is required especially during winter months.

It is observed that productivity is higher in plantations where irrigation is provided. Hence irrigation can be provided artificially such as sprinkler or drip irrigation. In heavy rainfall areas, water can also be conserved by using water harvesting structures such as Jalkhud to provide irrigation during lean period.

SHADE MANAGEMENT:

Large cardamom is sciophyte in nature, hence proper shade management should be followed. But it has been observed that the farmers usually have been following their traditional way of plantation i.e. open cultivation. In Anjaw district, the hills are covered with large cardamom plantation, but no shade management practice has been followed. This has led to overexposure to direct sunlight causes yellowing of leaves, resulting in decline in its production and quality. It is also noticed that heavy shade or less shade hinders crop growth and production. So about 50% shade should be followed.



WEEDING:

Weeding is the important operation for maximum utilization of available soil moisture and nutrients by the plants. Usually in new plantation, three rounds of weeding are required for effective control of weed growth. Weeding is generally done by using a sickle or by hand. The dried shoots and other thrashed materials can also be used as mulch around the plant base which will help to conserve moisture in the ensuing dry months.

DISEASE AND PEST MANAGEMENT:

Major threat to large cardamom is the widespread occurrence of viral disease “Foorkey” causing tremendous damage and consequent crop loss. Among the insect pests that attack large cardamom, leaf caterpillar (*Artona chorista* Jordon) and stem borer (*Glyphipterix* sp.) are considered as important pests of the crop. Aphids are responsible for transmitting viral diseases viz., chirkey and foorkey. White grub is also becoming an important pest and need attention for their control. Phyto- sanitation, removal and burning of infested tillers is helpful for managing the

pests. The diseased plants (especially viral diseases) may be uprooted and destroyed as and when they are seen. They should be taken to an isolated place, chopped into small pieces and buried in pits for quick decomposition. As an alternative, mass uprooting and burning of infected plants at the village / area level could be taken up for eradication of the disease.

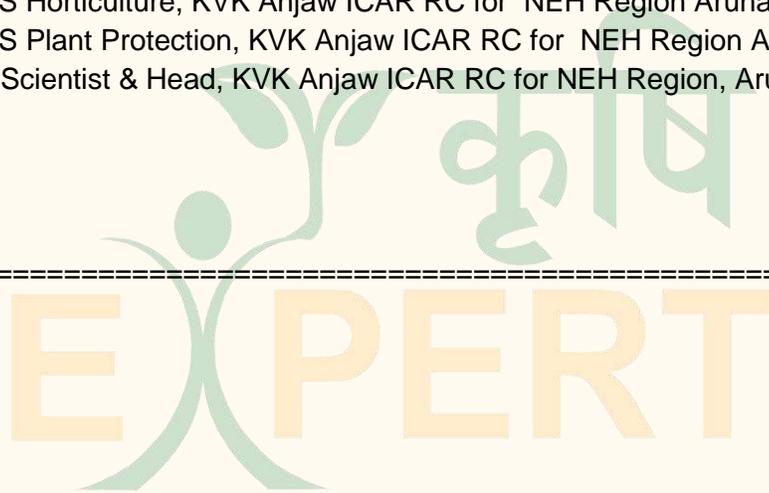
HARVESTING AND CURING:

The indication of time of harvest is when the seeds of top most capsules turn brown. As soon as the said colour appears and to enhance maturity bearing tillers are cut at a height of 30-40 cm from ground and left for another 10- 15 days for full maturity. The spikes are harvested by using knives. The harvested spikes are heaped and capsules separated and dried. The cured capsules are rubbed on wire mesh for cleaning and removal of calyx (tail).

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