

Note on the Production of Cardamoms.*

BY E. BROWN.

THE cardamon of commerce consists of the dried ripe fruit of *Elettaria cardamomum* Maton (fam. Zingiberaceae). The name cardamom has also been applied to the fruit of other plants of the Zingiberaceae family, especially to those of the genus *Amomum* that are cultivated in Indonesia. These latter are little known outside the Far East. It is of particular importance to note that only the fruit of *E. cardamomum* is official in the British and United States Pharmacopoeias.

The cardamom plant requires elevation, moisture and shade. In Southern India and Ceylon, it grows at altitudes between 2,500 ft. and 5,000 ft. in districts with an average temperature of 72 degrees F. and average yearly rainfall of 120 in. The shade provided by moist mountain jungles is also highly important.

The soil should be rich, with a high humus content; even swampy ground is suitable. Loamy soil, as used for pepper, is quite satisfactory, and cardamom is often planted as a secondary crop alongside pepper. In some areas it is grown with coffee.

In parts of India, plantings are started in February or March. A part of the forest is cut down, rows of trees 20 to 30 yards wide being left standing between the plantings, to act as shade trees. The first harvest can be gathered in the fifth year; † production may continue for eight years after which the planting has to be renewed.

Improved methods of planting are in use in Ceylon and along the Malabar coast. The plants are propagated either by division of the rhizomes ('bulbs') or by seed grown in beds and nurseries, though the seeds germinate very slowly. If rhizomes are used, the soil is thoroughly cleaned, and holes are dug 12 to 15 in. deep, 1½ to 2 ft. wide and 7 ft. apart in both directions. In Ceylon, cardamom is now

propagated mainly by means of seedlings after they have been in a nursery bed for about a year.

Harvesting takes place principally in February/March and August/September; but smaller quantities can be obtained throughout the year, at two-monthly intervals. The capsules are gathered from the stems just before complete maturity, when still somewhat green but beginning to turn yellow. If left on the stem to ripen, the capsules split and eject the seeds. It is now the practice to cut off each fruit carefully with scissors, a portion of the pedicel being left attached to each capsule. It was formerly the custom to pull off whole racemes of fruit, but this was wasteful because not all fruits ripen together. The yield is from 150 lb. to 300 lb. of cardamoms per acre.

The capsules are prepared for the market by drying or curing, which can be done in two ways. In the oldest but cheapest, and still widely used, method, the fruits are dried slowly on mats by exposure to the sun; care is necessary, as too rapid, or excessive, drying may cause the capsules to swell and burst, leading to loss of seed. Sun-drying also bleaches the capsules to some extent.

Artificial drying, in kilns, is often preferred. Kiln-dried cardamoms retain their green colour well, are less liable to split and fetch a higher price than the sun-dried spice; but they must be thoroughly dried, otherwise they may become mouldy in the course of shipment. Fresh cardamoms lose about 75 per cent. of their weight on drying, but the precise amount varies, as some types are moister than others. In India, completion of drying is judged by weight loss, the standard loss for any particular locality having been determined by practical trials. Commercial cardamoms contain about ten or eleven per cent. of moisture.

Details of some cardamom kilns are given in the following publications:—

Note on the Departmental Cultivation, Collecting and curing of Cardamoms in the Evergreen Forests of Madras Presidency, by A. H. Khan (*Indian Forester* 1944, April 70: 106-114).

* Reprinted from *Tropical Products Institute Report* No. G.26, June, 1966, Tropical Products Institute, 56-62 Gray's Inn Road, London, W.C.1.

† Maturity in the Territory of Papua and New Guinea has been much more rapid as experienced in experimental plantings of the crop to date.

Cardamoms," by W. Molegode, (*Tropical Agric. (Ceylon)* 1938, December, 91 : 325-332).

Both articles describe wood-fired, flue-heated buildings, constructed of materials easily obtainable locally. In the Indian kiln, the cardamoms are dried on bamboo floors, whilst in the Ceylon kiln the drying trays are timber framed with wire-mesh or hessian bottoms.

The main objective in drying cardamoms is to prevent the capsules from splitting, and thus exposing the seeds to the atmosphere. The seeds contain the bulk of the volatile oil in the spice, averaging about 6 per cent., but the pericarp contains very little; *decorticated seeds lose their volatile oil fairly rapidly, as much as 30 per cent. in eight months, whereas the loss from the whole, unsplit fruits is very slight in the same period.*

Apart from this, the trade attaches great importance to the external appearance of the capsules themselves, which may be either green or bleached. Green cardamoms are most suited for

distillation and should be firm to the touch and tightly closed. Bleached cardamoms are a fancy grade used mainly in mixing spices for pickling and other culinary purposes. Bleaching is sometimes carried out by exposing the fruits to the fumes of burning sulphur in sealed rooms; or it may be done by stirring the fruits in an extract of the soap-berry tree, and then exposing to the sun, occasionally sprinkling with water.

When the capsules are sufficiently dried, the pieces of attached stalk are clipped or rubbed off, and removed by hand—or machine-winnowing. The final product may need a further air drying before shipment. Sunlight spoils the colour of the dried fruits and they should be stored in a dark room, in rat-proof metal or wooden boxes. For export, the capsules should be packed in venesta cases, lined with tin foil, polythene or sisal-kraft, or in new jute bags with waterproof linings. Cardamom seeds should be packed in clean, dry tin-plate containers or in waterproof lined wooden cases.