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KARANA IS EXCELLENT AS SHADE TREE FOR CARDAMOM

by
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THE tree, known as *karana* (*Vernonia monocis* C.B. Clarke) in Malayalam, is found to be an excellent shade tree for cardamom in the Cardamom Hills of Travancore. By planting this quick-growing evergreen tree, a suitable permanent shade canopy can be provided for the cardamom crop in a very short time.

The three fundamental requirements for the normal development of the cardamom crop in south India are suitable elevation, rainfall (humidity and soil moisture conditions) and shade from evergreen trees.

The shade canopy provides a suitable environment for cardamom by maintaining humidity and evaporation at a suitable level. The continuous fall of dry leaves from the shade trees provides mulch which covers the soil surface. This mulch not only prevents the loss of soil moisture, but after decay keeps the soil constantly supplied with humus, which provides nitrogen to the crop.

The cardamom-growing areas of south-west India can be divided roughly into five regions from the shade point of view.

(1) The evergreen jungle areas of the extreme south, comprising the cardamom areas of Tirunelveli and Ramanathapuram districts. The Anamalai region is also of this nature.

(2) The Cardamom Hills of Travancore and the adjoining Pattiveeranpatti area, where a good proportion of the forest trees are deciduous, shedding their leaves in the dry season.

(3) The old coffee areas in the Mysore *malnad*, which were subsequently planted with cardamom. Here, the proportion of deciduous trees is even higher than in the Cardamom Hills of Travancore.

(4) The cardamom areas in Coorg where the

An open ravine planted up with cardamom with *murikku* cuttings planted for temporary shade. On the extreme left, *karana* saplings have been planted for permanent shade



male system of cardamom cultivation is practised. This region naturally presents no problem when small patches are cultivated in small plots, usually in ravines, and protected from the afternoon sun.

(5) The arecanut-cum-cardamom gardens of North Kanara. Here the shade is provided by arecanut palms which constitute the main crop. From the appearance and performance of the cardamom clumps in these gardens, the areca trees seem to provide the type of shade which is quite satisfactory.

EVERGREEN FORESTS

In the evergreen forests of the first two regions, the problems connected with shade management are different from those of the old coffee areas (third region) of Mysore *malnad*. When an evergreen forest is opened up for cardamom, care and foresight are needed to provide a correct shade canopy.

Under natural conditions in evergreen forests, there is a continuous cycle of old trees dying and new trees taking their place. However, when the undergrowth is cleared for planting cardamom, large numbers of young trees are removed. This upsets the balance of the jungle considerably and in course of some years, due to the death of old trees one by one, open gaps will be left for which there will be no replacement trees available.

In these areas, the precautions against such a contingency seem to include the protection of a certain proportion of saplings of larger kinds (species) of trees, especially near old trees which may die out in a comparatively short time. It is also desirable while weeding to avoid the removal of seedlings of useful shade trees, which may in the long run close such gaps.

The lack of precautions of this nature usually leads to large gaps in the shade canopy, when the cardamom deteriorates rapidly. This is a marked feature of the cardamom plantations of the Cardamom Hills of Travancore, where the presence of a considerable proportion of deciduous trees complicates the issue.

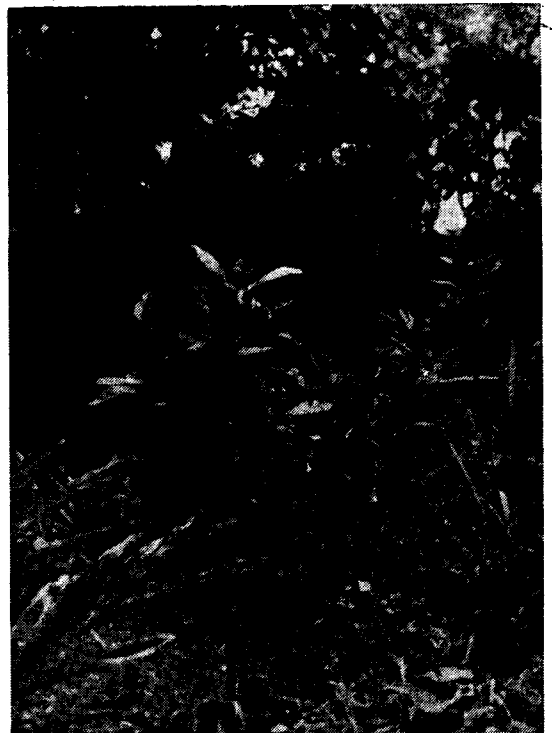
In the Mysore *malnad*, the shade contains a still higher proportion of deciduous trees, and efforts must be made to replace at least those which go out of leaf in the hot months.

USUAL PRACTICE

The usual practice in these areas to remedy the loss of shade due to the causes mentioned above is to encourage the growth of short-lived, temporary shade trees such as *wattakanny* or *uppila* (*Macaranga peltata*), *perumaram* (*Clerodendron infortunatum*), *putharichunda* (*Solanum giganteum*) and *mullillamurikku* (*Erythrina lithosperma*) and a few other such trees and shrubs.

Experience has, however, shown that these trees and shrubs do not provide a permanent shade canopy sufficiently high above the ground level or cardamom 'zone' and, therefore, require replacement or other suitable trees. Moreover, some of these temporary shade trees, such as *Clerodendron infortunatum* and *Erythrina lithosperma* seem to have an unfavourable effect (perhaps root effect) on cardamom.

It has also been observed that cardamom does not thrive so well under certain evergreen trees as under others. Generally, very hard-wooded trees use up a good proportion of soil moisture and nutrients and plants like cardamom, which need plenty of soil moisture and nutrition, suffer under such



One and a half year-old *karana* saplings planted in an open patch of a cardamom field. Note the large leaves of the saplings

trees. However, *vedipila* (*Cullenia excelsa*), wild nutmeg (*Myristica beddomei*), species of *Ficus*, *vaga* (*Albizia lebbek*), jack tree or *pilavu* (*Artocarpus integrifolia*), *thanni* (*Terminalia belerica*) and *channana vembu* (*Cedrella toona*) are considered to be good shade trees for cardamom. Careful observations spread over a number of years are needed to definitely decide the relative usefulness of these trees as shade for cardamom. But one defect in all these trees is that they are comparatively slow-growing insofar as closing of gaps in shade is concerned.

In very recent times, cardamom growers of the Cardamom Hills of Travancore have been rapidly solving this problem by planting seedlings of *karana* tree wherever sufficient shade is required to be rapidly built up. The

Flower-heads of *karana*. Note the characteristic flowers



Following are the most outstanding among the desirable features of this tree.

- (1) The tree grows very rapidly, attaining a 15 to 20 feet height and giving substantial shade in three to five years' time. In ten to 15 years, the tree attains a height of 30 to 40 feet, spreading out magnificently to give a good canopy.
- (2) The tree is evergreen and sheds its leaves partially only during the rainy season when cardamom does not require much shade.
- (3) The leaves of the tree are large, nine inches by five inches, when the tree is young, but become much smaller when the tree is older and provide a heavy mulch in the cardamom field.
- (4) No other tree in the Cardamom Hills of Travancore combines in it all these qualities most desirable in a cardamom shade tree.
- (5) Cardamom clumps are found to flourish well under this tree.
- (6) After every rainy season, large numbers of self-sown seedlings of the tree may be gathered.

The *karana* tree belongs to the family of plants to which the sunflower belongs, i. e., *Compositae*. This is one of the largest of plant families, consisting almost entirely of herbaceous annuals and perennials and climbers. *Vernonia* is the only tree belonging to this family. There are two kinds (species) of *vernonia* trees, one being the *karana, monocis*, and the other *Travancorica*. *Travancorica* is a much shorter tree and not so useful for cardamom shade as *monocis*. The unique features of this tree are perhaps linked with the fact that this is the only tree of the *Compositae* family.

Vernonia monocis occurs naturally on the Western Ghats from Coorg and the Bababudan Hills of Mysore to the Nilgiris, Anamalais and the hills of Travancore. The tree is common in Nilgiri Sholas.

The discovery of this unique tree as most suitable for the rapid building up of a permanent shade canopy in cardamom fields has almost solved the problem of closing gaps which frequently occur in the shade canopy of cardamom fields in the higher elevations of the cardamom-growing areas of south India.

The tree, however, grows only at elevations above 3,000 feet. This is the range of elevations in which cardamom also thrives best. The tree, therefore, is not suitable for cardamom below this level. It is highly desirable to try this tree in the cardamom areas in Mysore, including Coorg, Nelliampathies, Anamalais and in the cardamom areas in Ramanathapuram and Tirunelveli districts.

A year or two ago, self-sown *karana* seedlings collected from the forest used to cost only eight annas per hundred, but at present, it is Rs. 4 per hundred seedlings.

No trials yet seem to have been made to raise seedlings of the *karana* tree in nursery beds.

Karana can now be seen planted as a subsidiary shade tree in almost all cardamom plantations along the Kumali-Munnar road.

Cardamom being a very valuable crop at present, open valleys or ravines and even paddy fields are being converted into cardamom fields. The low-lying areas are thrown into high beds, planted with cardamom and then planted with *Erythrina lithosperma* as a temporary shade and *karana* seedlings to provide permanent shade.