

THE CULTIVATION OF FRUITS IN CEYLON WITH CULTURAL DETAILS—VI

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GROUP A

SOME FURTHER FRUITS FOR THE LOW-COUNTRY WET ZONE

(4) DURIAN (*Durio zibethinus*).—A semi-cultivated tree much esteemed in the Malay region and introduced to Ceylon before 1850. It is rapid growing and attains very large dimensions, sometimes up to 100 feet or more in height and bears large round to oval fruits often exceeding 6 lb. in weight. When mature the fruit has a whitish buttery flesh which surrounds the seed and is enclosed in a hard bony shell set with sharp-pointed prickles. In Ceylon it is but rarely cultivated and during the season—July and August—there is a ready demand for all available fruit. To those unaccustomed to the fruit it has a strong and disagreeable smell, but when the taste of the fruit has been acquired it is considered sufficiently delicious to overcome this prejudice. The seeds are edible and when roasted are most palatable.

In the Malay Islands the tree is usually found in open country on the edges of forests and in and around villages and clearings. It does not appear to exist in any large numbers outside its natural home and this is most probably due to the fact that the seeds are of very short vitality. There appears to be at least two varieties at Peradeniya, the majority of the trees bearing various sized roundish fruits, whilst one particular tree has a particularly long, oval, and very large fruit, the flavour of the latter being considered superior to the roundish fruits. Generally speaking the trees vary considerably in productiveness, size, shape, and flavour and quality of pulp, some trees being almost barren. Selection and good cultivation should therefore be practised in order to obtain the best fruits.

Though the tree usually flowers in March-April and fruits in July-August, the flowering and fruiting season does occasionally change if an abnormal dry spell in September-October is experienced, the fruits then being produced in February and March.

The climatic requirements of this tree are strictly tropical—ample moisture and warmth—and the laterite soil of the low moist region of Ceylon from sea level up to 2,000 feet is suited to it, but if a good deep soil is available, this is appreciated. The tree is propagated from seed which should be sown at once after extraction from the fruit.

Experience shows that it is advisable to sow the seed singly in bamboos or other pots and plant out direct from the pot, as transplanting from beds results in many casualties. The seedlings germinate within a week to 10 days and attain sufficient height at 3 months of age to be planted in permanent sites.

Owing to its lofty and spreading nature planting as an orchard tree is rendered impracticable and plantings here and there in open spaces is advised, large holes 4 feet by 3 feet deep being prepared for the young plants. Protection should be afforded in the early stages against damage by cattle and such like and a single stemmed tree should be encouraged since the wood is very brittle, and a many stemmed tree becomes a source of damage in high winds.

No pruning data is available as the tree is not generally cultivated but the use of the knife in the formation of a single stem where necessary and the removal of any dead branches is all that is required.

(5) CUSTARD APPLE (*Anona squamosa*) known also as the Sugar apple, Sweetsop, and Anoda, S. is a small tree not exceeding 20 feet in height and is of tropical American origin. It has been established in this Island for some considerable time and is commonly cultivated throughout the tropics. There are several species of *Anona* yielding useful fruits, their order of importance being, the Cherimoya (already dealt with), Ilama (*Anona diversifolia*), Custard apple (*Anona squamosa*), Soursop (*Anona muricata*), Bullock's Heart (*Anona reticulata*), and the Alligator Apple (*Anona palustris*), the latter being considered very suitable as a stock plant on which to bud and graft the other species.

The Custard apple (with the possible exception of the Ilama, a new plant received here in 1924 and dealt with later) is the best of the tropical anonas and there is a ready market at all times for good fruit. The latter is normally of average size attaining the dimensions of a good sized orange but is heart shaped, the skin or rind being scaly, which when ripe breaks away separately.

The pulp is white, granular, sweet and custard like and has a pleasant, slightly acid flavour, thereby forming a very useful dessert fruit. There is a purple skinned variety, but beyond this rather attractive colour it has little to recommend it.

Though cultivation is restricted to tropical regions it thrives in both wet and dry zones from sea level up to 3,000 feet and in a large variety of soils. Its versatility in this respect is remarkable and it can be found growing in quite heavy soil if the drainage is good, and in almost pure sand since it stands drought very well. Its range comprises tropical America, West Indies, tropical Africa, India, Malaya, Cochin-China, the Philippines, the Polynesian Islands, and along the coastal region of Queensland. If preference can be given, a deep loamy to loose sandy soil with perfect drainage is best suited to the tree and in such soils remarkably good crops can be anticipated, provided good cultivation is given. Some trees are, however, as with Chérimoya, more productive than others, and variation in size and quality of the fruits are observable from trees of seedling origin. Propagation of superior trees by budding as with the Cherimoya, is therefore advisable and experiments here show that this can be done, the stock used being the Soursop. Seedling stocks of the Bullock's Heart and Alligator Apple are, however, being raised for further experiment in this respect.

The seeds should be sown whilst fresh in prepared pans or boxes, germination taking from 3 to 5 weeks according to elevation. - Growth of the seedling is fairly rapid at low elevations but at 1,500 feet and over is proportionally slower. Potting into pots or tins can be undertaken when the seedling reaches 3 to 4 inches in height and at 9 to 12 months of age according to elevation, the seedlings can be transplanted to a permanent site, setting them out at from 15 to 18 feet apart in well-prepared holes to which a fair amount of well-rotted cattle manure has been added. It is well to remember that this fruit will not tolerate bad drainage conditions and when sickly trees are observable it can in most cases be traced to lack of drainage.

Seedlings fruit in 3 to 4 years and are normally very productive if of a good strain. Where budding is undertaken the inverted T method as described for the Cherimoya is applicable.

(6) SOURSOP (*Anona muricata*).—This robust tree is similar to the Custard apple in its requirements and attains a similar height. The leaves, however, differ in being more leathery and of a dark-green colour and the tree is of more rapid growth. The fruit, often weighing 5 lb. each, is sweet and juicy and used considerably for flavouring and in beverages. In tropical America, Cuba, and the West Indies the Soursop is unrivalled for the preparation of sherbets and other refreshing drinks. It thrives best in the wet zones from sea level to 2,000 feet or more, and prefers a good loamy soil to any other. Owing to their

enormous size a crop of 2 dozen or so fruits can be considered a fairly good yield for a mature tree. Selected trees should here also be propagated by budding either on to own seedlings or on the Alligator Apple or Bullock's Heart, the method being the same as applied to the Cherimoya and the Custard apple.

Seedlings germinate more quickly than the Custard apple and are ready for transplanting at a relatively earlier age, 6 to 8 months from sowing being the usual period. The tree is somewhat erratic in its fruiting. It is believed that attention to pollination results in better crops, and this applies also to most of the other Anonas, and hand-pollination of the flowers should be undertaken. A further aid to fruit production is generous manuring and a commercial fertiliser containing 3% Nitrogen, 10% Phosphoric acid, and 10% Potash has been found in Cuba to be very effective.

(7) ILAMA (*Anona diversifolia*).—Though this plant is not yet available at Peradeniya for distribution, it is mentioned because of its high reputation in the Western tropics. It is there considered the finest anonaceous fruit which can be grown in tropical lowlands, superior to the Custard apple and only slightly inferior to the Cherimoya and is called the low-country Cherimoya. A description of this new fruit was published by Washington in 1912, and dissemination of the species began soon after. The first seed reached Peradeniya in 1922 but all failed to germinate. A second consignment of a few seeds received in 1925 resulted in 2 plants being raised and these are now being grown at Peradeniya. The habit of the plant is very similar to the Cherimoya as are the characters of leaf and fruit.

It is reported to be of slender growth, attaining a height of 25 feet, the fruits weighing up to 1 lb. each and varying in colour from pale-green to magenta pink, the latter being more acid and very closely resembling the Cherimoya. It is indigenous to the foothills of Mexico, Gautemala, and Salvador but not known to occur above an elevation of 2,000 feet. It should, therefore, be suited to the semi-dry regions of Ceylon up to 3,000 feet but in the dry region proper irrigation facilities would be required. The soil requirements presume a deep rich loose loam, but with good drainage the tree would appear suitable to most parts of Ceylon within the elevations stated.

The tree reaches bearing age in America in 3 to 4 years but the Peradeniya trees, not yet acclimatised, have not yet reached this stage. It is further stated that a mature tree will often bear 100 fruits in a single season but that it varies in production and size of fruit as do the other Anonas and budding, therefore, of the best sorts is necessary. Budding on the Soursop at Peradeniya for purpose of multiplication of material has not so

far been attended with success but trials on the Alligator Apple and Bullock's Heart are being made and some success is expected in due course. The plant seems a valuable acquisition and every effort is being made to increase the quantity and later to improve the type for cultivation in Ceylon.

(8) RATA UGURESSA (*Flacourtia cataphracta*).—This group of fruits to which the Uguressa of Ceylon, the Lovi-Lovi of Malaya, and the Philippine Rukum are related, are usually small trees which produce abundance of small but pleasant fruit. The Rata Uguressa appears the best of the group, the tree attaining a height of about 20 feet with a spreading head when fully grown, and the stems are armed with stout thorns. The fruit is globular in shape, the largest attaining a diameter of one inch or more and is of a dull reddish to deep maroon colour. The flavour is sweet and agreeable but even when ripe the fruit is hard and astringent and apparently uneatable, but if rolled in the hand or pressed with the fingers it becomes quite soft and the astringent taint disappears entirely. The fruit, and particularly that of the more acid varieties is used to a considerable extent in the making of jams and preserves.

It is a native of India and Malaya and now widely scattered throughout the tropics though not extensively cultivated; and is suited to both wet and dry zones of the low-country. It will grow in moist soils if well drained but prefers a dry soil and is of rapid growth attaining the fruiting stage in 4 years. It prefers an open position in the full sun or at the most very light shade.

Propagation is invariably by seed though there are superior varieties that should be propagated by budding on to own seedling stock. A drawback with the seedling method is that the species, being dioecious, more male plants are produced than is necessary for pollination purposes.

The seeds are small and thin and should be sown carefully in a prepared soil in boxes or pans. Germination is slow and the boxes should not be kept too wet during this period. The seedlings are large enough for removal into pots when they attain 3 inches in height, usually at 3 to 4 months of age after which growth is more rapid. At 12 to 15 months of age the potted plants can be transferred to permanent quarters, ample spacing being afforded since the tree is of a remarkably spreading character, a full-grown individual specimen often covering an area 40 feet or more across.

The tree should be allowed to take its natural shape and little pruning is required beyond the periodical removal of any dead shoots.

Its cultural requirements are few but periodical manuring with well-decayed cattle manure and mulching during prolonged dry spells is, as with other fruits, to be recommended.

(9) UGURESSA (*Flacourtia Ramontchi*) known in parts of the Eastern tropics as the Ramontchi and in the West Indies as the Governor's plum and in Ceylon as the Uguressa, S. Katukali, T. It is a native of the low-country, but is rare in the wild state and mostly found cultivated. The fruit is fairly sweet and of a dark-purple colour, $\frac{1}{2}$ an inch or so in diameter, but is in general inferior in both size and flavour to the Rata Uguressa though excellent jelly is made of this fruit.

The mature tree is less spreading in habit than the Rata Uguressa and is more thorny in character but otherwise closely resembles the latter fruit and requires much the same treatment in cultivation. It is strictly tropical, will grow on soils of various types and is not exacting as to its cultural requirements.

Where known, the fruit is appreciated and attention to selection with good cultivation should improve the quality considerably.

(10) LOVI-LOVI (*Flacourtia inermis*).—A relative of the Uguressa and the Rata Uguressa and is a very ornamental tree of Malayan origin, thornless, and attains a height of some 25 feet. The fruit is from 1 to $1\frac{1}{2}$ inches in diameter, a bright cherry red in colour and very acid, not unlike the European Red Currant. Though not attractive as a dessert fruit owing to its excessive acidity it makes excellent jellies and preserves, and can be used in tarts and also stewed if plenty of sugar is supplied.

Two crops a year can be obtained, in March-April and again in August-September and the tree is a remarkably heavy cropper.

It is propagated by seed, which is small, and should preferably be sown in boxes and kept under cover until the seedlings are about 2 months old, when they should be allowed more light and exposed to harden them off. Care is required in the young stages since the seedlings are small and delicate and transplanting into baskets or bamboo pots should be undertaken at 3 to 4 months of age. At the age of 15 to 18 months the seedlings should be ready for transplanting to permanent sites, good sized holes of 4 feet by 2 feet deep having been prepared and well-decomposed cattle manure added when refilling the hole. Planting distances should not be less than 20 feet by 20 feet as the mature tree attains a spreading habit and once established grows very freely.

The tree is suited to the low moist zones from sea level to 2,000 feet and thrives on most soils but prefers a deep loamy soil with ample moisture combined with good drainage.