

LYCHEE CULTIVARS IN HAWAII

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INTRODUCTION

There are presently at least 14 lychee cultivars being grown in Hawaii. Eight of these are in the variety trial orchards of the University of Hawaii Horticulture Department, while 6 others are found in backyard plantings and small commercial orchards. Commercial lychee plantings in Hawaii are relatively small and usually consist of not more than a few dozen trees. Lychee production in the State is so erratic and undependable that prospective growers have not been encouraged to plant orchards. There are enough trees in backyard plantings and small orchards however, so that when there are good crops, fresh lychees are sold in local markets. When available, considerable quantities of fresh lychees are also exported to the mainland United States. Exports to the mainland have increased from about one ton in 1959 to 44.5 tons in 1969 (Table 1). Export growth represents increased marketing efforts more than increased production, since production tends to be erratic and unpredictable from year to year. For example, exports to the mainland totaled less than 500 lbs. in 1970, following the record export of 44.5 tons in 1969.

Descriptions of 6 main lychee cultivars in Hawaii follow:

'Kwai Mi'—Cinnamon Flavored

This is probably the best and most widely grown cultivar in Hawaii. It is an old, well-known Chinese cultivar having been introduced into Hawaii from China in 1873. In common with other Chinese cultivars, it does not produce regular crops in Hawaii, although individual trees sometimes produce heavy crops in favorable years. Fruits are bright red with smooth to moderately spiny skin. The flesh is firm and sweet when ripe, but acid until fully mature. Fruits average about 30 to a pound and are borne in large clusters of 15 to 30 per bunch. A large percentage of the seeds are plump and fully developed but at times there are also appreciable numbers of shriveled, undeveloped seeds. The tree is large with vigorous, spreading, upward curving branches. Crotches are frequently weak so that breakage is common and propping and bracing are often necessary. The bark is ashy gray in color. Leaves are large and medium green with an average of 6 leaflets per leaf. 'Kwai Mi' is a relatively early maturing variety, the fruits generally ripening from early May through June in Hawaii. It is presently the most popular and widely grown lychee cultivar in the State. 'Mauritius' and 'Charlie Tong' are

synonyms of 'Kwai Mi.'

TABLE 1. TONS OF FRESH LYCHEES EXPORTED FROM HAWAII TO THE MAINLAND U. S. 1959-70*

<i>Year</i>	<i>Honolulu (T.)</i>	<i>Hilo (T.)</i>	<i>Total (T.)</i>
1959	1.0	—	1.0
1960	6.0	—	6.0
1961	1.6	—	1.6
1962	2.4	—	2.4
1963	1.9	0.2	2.1
1964	6.7	1.0	7.7
1965	1.8	3.9	5.7
1966	5.8	2.5	8.3
1967	3.8	5.6	9.4
1968	10.0	11.0	21.0
1969	12.5	32.0	44.5
1970	0.2	0.05	0.25
Totals	53.7	56.2	109.9

'Hak Ip'—black leaf

'Hak Ip,' the second most important lychee cultivar in Hawaii, was brought into Hawaii from China in 1917 by Dr. G. Weideman Groff. It has been distributed through the state largely because of its desirable, compact tree form and because it sometimes fruits in years when many other lychee cultivars do not. The fruits which are maroon in color with relatively smooth, tough skin, average about 28 to the pound. Flesh is firm, sweet and mild in flavor when fully ripe, but acid until fully ripe. Clusters are large and compact with from 15 to 25 fruits per cluster. Fruits have broad, rounded shoulders with a distinctive line along the sides. The seeds are characteristically large and well developed. Trees are compact and slow growing with closely spaced branches and dark gray bark. The leaves are large and characteristically dark green, hence the name "blackleaf." There are usually 4 to 6 leaflets per leaf. 'Hak Ip' is considered to be a good home garden variety and a few trees are occasionally found in small commercial plantings. It usually ripens in June and July.

'Groff'

This cultivar, which was developed in Hawaii from a 'Hak Ip' seedling, was named in honor of the late G. Weideman Groff. Fruits are dull red with a rough spiny skin. The flesh is firm, sweet and pleasantly aromatic when fully ripe but acid until fully mature. Fruits are smaller than most other varieties grown in Hawaii, averaging 38 to 42 to the pound, with 20 to 40 fruits per cluster. The leaves are rather small and fine, mostly with 4 to 6 leaflets. An outstanding feature of 'Groff' is that 90 to 100% of the fruits usually have small shriveled seeds and therefore a higher percentage of flesh than other varieties. In Hawaii it is also more regular in fruiting habits than any of the Chinese cultivars tested. Trees are of medium vigor and upright with V angled crotches so that training is necessary to avoid breakage. It is a late maturing variety, often ripening in late August and September. 'Groff' is recommended for home gardens, because of its

late ripening season and excellent fruit quality. Fruit size is however considered rather small for marketing commercially.

'Brewster'—syn. 'Chen family purple'

'Brewster' was imported into Hawaii from China by the USDA in 1907 under Plant Introduction No. 21204. 'Brewster' fruits are very attractive bright red in color and when fully ripe, sweet and rather juicy.

They are however, somewhat wet and messy to peel and unpleasantly acid until fully ripened. The fruits which average about 20 to the pound, are born in loose clusters of from 10 to 20 fruits. The seeds are relatively large and almost always fully developed. The large dark green leaves are usually divided into 6 leaflets. The trees are large, vigorous and upright growing with sharp crotches so that careful training is necessary to minimize breakage. The bark is light gray. Both the trees and fruits somewhat resemble 'Kwai Mi' in appearance and it is not surprising that 'Brewster' has frequently been mistaken for 'Kwai Mi' in Hawaii and elsewhere. Careful comparison of fruits of the two varieties however reveals that they are different enough so that it is not difficult to distinguish between them.

'No Mai Tsze'—glutinous rice cake

This is perhaps the most famous of the Chinese lychee cultivars. Unfortunately it fruits poorly in Hawaii. The oldest 'No Mai Tsze' tree in Hawaii is about 30 years old and has produced only 3 small crops during this entire period. There are a number of other 'No Mai Tsze' trees in the State, some of which have borne a few fruits, but it cannot be considered satisfactory in Hawaii because it so rarely produces fruit. Fruits of 'No Mai Tsze' are rose colored with a yellow undercolor and firm, brittle skin. They peel cleanly and have soft aromatic flesh of excellent flavor and texture. They are only slightly acid when not fully ripe. The fruits which average about 25 to the pound have broad shoulders. Usually at least 30 percent and often 50 percent or more of the fruits have shriveled, underdeveloped seeds. The trees are slow growing with closely spaced, spreading branches. The bark is smooth and dark brown. The leaves are small, light green and usually have 6 leaflets although 4 is not uncommon.

'Pat Po Hung'—eight precious red

This is not a popular or well known cultivar, but there are a few bearing trees in the State. 'Pat Po Hung' fruits superficially resemble those of 'No Mai Tsze' with which it has frequently been confused. Fruits of 'No Mai Tsze,' peel easily, however, and are relatively dry, while those of 'Pat Po Hung' are somewhat moist and messy to peel. 'Pat Po Hung' fruits are purplish-red in color and have a thin pliable skin. The flesh is soft, melting and rather wet during and after peeling. They are sweet, even before fully ripe, a characteristic which is liked by some people. The fruits average 35 to the pound and have medium to large seeds. The trees are slow growing with spreading, sprawling branches which frequently require bracing and propping. The light green leaves have 6

leaflets. 'Pat Po Hung' is considered to bear about as well as 'Kwai Mi' which is considered a point in its favor.

DISCUSSION AND SUMMARY

Five of the cultivars described originated in China, while 'Groff' is a Hawaii grown 'Hap Ip' seedling. The bulk of present plantings in the State are 'Kwai Mi,' 'Groff,' 'Hak Ip' and 'Brewster' and although no statistics are available, there are probably more trees of 'Kwai Mi' in Hawaii than all other cultivars combined. Certain cultivars have demonstrated desirable qualities such as 'Groff' with small seeds and late season of maturity and the attractive, highly-colored fruits of 'Brewster.'

In addition to the varieties described, there are 8 others which have at times fruited in Hawaii. These are 'Hung Lai,' 'Fi Tsze Siu,' 'Kwa Luk,' 'Chong Un Hung,' 'Shan Chi,' 'Wai Chi,' 'Tim Ngam' and 'Bengal.' Probably the best of these lesser known cultivars are 'Tim Ngam' which has late-maturing fruit of desirable quality and 'Hung Lai' which has attractively colored, good quality fruit. From the standpoint of adaptation, production and fruit quality however, 'Kwai Mi' appears to be the best cultivar presently available.

Lychees have been grown in Hawaii for almost 100 years without developing into an important fruit crop. They have however maintained a strong position as a favorite combination ornamental and fruit tree.

If regular bearing cultivars could be found or a practical and reliable means of inducing regular bearing, discovered, there would be a good possibility of developing a commercial lychee growing industry in Hawaii.

Since present cultivars are erratic in bearing behavior a breeding program might hopefully produce cultivars with more reliable bearing habits. This appears difficult and time consuming however, since the percentage of lychee seedlings worthy of selection is less than one percent and seedlings take from 10-15 years to come into bearing.

This is a brief summary of the situation that exists regarding lychee cultivars and their utilization in Hawaii. Lychees are and probably will remain a favorite ornamental fruit tree since there is hardly a more attractive ornamental fruit tree than a well shaped dark green lychee tree heavily laden with clusters of bright red fruit.