

NOTICE TO EMPLOYERS OF LABOR

The Territorial Board of Immigration is prepared to receive applications from all those offering employment to European Immigrants.

Applications should be accompanied by statements of the number and class of people needed, wages and inducements offered, and whether any homestead agreement will be tendered the immigrant. Address communications to William Savidge, Assistant Secretary, Room 403 Stangenwald Building, Honolulu.

RICHARD IVERS, President
A. L. C. ATKINSON, Secretary

HAWAII'S AGRICULTURAL POSSIBILITIES

EXTRACTS FROM PROMOTION COMMITTEE PAMPHLET ON THE AGRICULTURAL POSSIBILITIES OF HAWAII PREPARED BY DR. E. V. WILCOX, SPECIAL AGENT IN CHARGE OF THE U. S. AGRICULTURAL EXPERIMENT STATION.

CASSAVA.

Cassava is gradually taking the place of arrow root as a food plant for the native Hawaiians; and it is also being cultivated in increasing areas for the production of starch and as feed for animals. In our Territory, it grows as a perennial, if allowed to run wild, but is best treated commercially as an annual crop. It thrives well from sea level up to an altitude of 3,000 feet, except in very wet climates. The cuttings are planted in November to February, in furrows two to four feet apart. The soil is kept well cultivated and the roots are ready for harvest in October or November. The yield of roots ranges from five to ten tons per acre. From these roots the yield of starch is somewhat greater than that from corn. From five tons of roots, about 2,500 pounds of starch can be obtained. For some time there was difficulty in finding a profitable market for cassava starch and little encouragement was met with in this industry. At present, however, the demand is active and the companies which are producing cassava are much encouraged. There is a good opening for the growth of cassava in this Territory for the production of tapioca, an industry which has, thus far, not been taken up in Hawaii. In addition to its uses for starch and tapioca, cassava is attracting more and more attention as a stock feed. The ranches are planting quite large areas of cassava as feed for hogs and cattle.

MATTING PLANTS.

Experiments with matting plants have now been carried on for two years, the species concerned being Chinese matting sedge and Japanese matting rush. It has been found that these plants thrive well in brackish or salt marshes along the sea coast, and that the yield is quite satisfactory. Chinese matting sedge, grown by the Hawaii Experiment Station, and sent to a manufacturing company on the mainland, has been declared to be of good quality, and valued at from \$10.00 to \$20.00 per ton. When well established, an acre will produce from three to four tons annually. The Japanese matting rush does not require splitting for the use of the manufacturer, but the Chinese matting sedge must be split before being used. The chief difficulty at present, in the commercial extension of this industry, is the lack of a suitable machine for splitting the sedge. Hand splitting is too expensive. There is a good prospect that such a machine will soon be perfected. When this is accomplished, there will be a profitable use for large areas of brackish and salt marshes at present unutilized.

CASTOR BEAN.

This plant has been known in Hawaii since early days. It grows wild as a perennial, sometimes developing into trees with trunks two feet in diameter. The plant thrives from sea level up to 3,000 feet or higher. In plantations, it is spaced about fifteen to twenty feet apart. Each plant may be expected to yield from twenty to twenty-five pounds of beans per year. The products from castor beans are castor oil and castor pomace. Castor oil finds a ready market and castor pomace is a valuable fertilizer, which could be used in many of our soils. The encouragement for the production of the castor bean has not been very great on account of the low prices at which it can be produced with cheap labor in India. Nevertheless, on a small scale, it may be depended upon to return reasonable profits. The simplest method by which this industry could be encouraged is to establish a central oil mill, which would purchase the beans from small producers at a reasonable price.

CORN.

Corn has long been cultivated, as a stock feed and for table purposes, in Hawaii. On the island of Maui there are about 5,000 acres in one region devoted to the production of corn. On Hawaii, at least one ranch is producing corn on a large scale, and will soon have 1,000 acres in this crop. Corn thrives from sea level up to an altitude of 5,000 feet. During the last season, on the Parker Ranch, at an elevation of 4,700 feet, a yield of fifty bushels of corn per acre was obtained without irrigation, under a rainfall of only two inches. The quality of sweet corn produced here is all that could be desired. Little attention has been given to the selection of seed corn, and for this reason, the ears would not take prizes in a corn exposition, but the percentage of kernel to cob is high, and the yield is quite satisfactory. Nearly all of the ranches are planning to raise corn in large quantities for the purpose of putting a finer finish on their beef, mutton and pork, and in the production of poultry.

PINEAPPLES.

For many years before commercial pineapple growing was established in Hawaii, a small native variety was known of excellent flavor. This variety is probably not indigenous, but is supposed by some to be a geographical modification of the "Red Spanish" pineapple. The variety almost exclusively grown at present is the "Smooth Cayenne." This variety was first introduced in 1834, and the pineapple industry began about 1850. There are now 4,500 acres in pineapples, chiefly on Oahu and Maui, but also on all of the other islands, and the plantations are constantly increasing. The output for 1908 was 350,000 cases of canned fruit and 1,000 tons of fresh fruit.

The altitudes most suitable for growing pineapples lie between 500 and 1,200 feet. It is desirable to have a rainfall of 35 to 60 inches or more. Pineapples will stand ordinary winds very successfully. Planting distances on different plantations vary considerably, and for this reason, the number of plants per acre ranges from 2,500 to 12,000. Where it is desired to grow large fruit for table use, the pineapples are commonly planted in rows six feet apart and 20 to 24 inches in the row. On some plantations the rows are four feet apart and the pineapples two feet in the row. Where smaller fruit for canning purposes is desired, the planting distance may be 18 inches to two feet each way, in beds of four rows with alleys between each bed. Another method of planting, which has been followed to some extent, consists in arranging the plants in groups of two rows, two feet apart, the groups being eight feet apart. Naturally, the size of the pineapple depends somewhat upon the spacing of the plants. Some of the canneries desire a fruit weighing from three to four pounds, and bring about this result by close planting. Where wide planting is followed, the fruit commonly attains a weight of six to ten pounds, and sometimes, much more.

The first crop of pineapples is obtained within 18 months to two years, and averages about ten tons. A ratoon crop follows twelve months later, in which the yield ranges from 15 to 20 tons per acre. The cost of production of pineapples is about \$15.00 per ton, and the canner price is \$20.00 per ton or more. The mainland price for fresh fruit ranges from \$80.00 to \$150.00 per ton. There are now nine canneries in the islands and about \$1,000,000 invested in the pineapple industry. The acreage of pineapples is constantly increasing, and for the past two or three years the output has been nearly doubled each year. The Hawaii Experiment Station is carrying on a series of fertilizer experiments with pineapples and is also investigating the cause of the yellowing of pineapple plants, and the best methods of rotation which may permanently maintain the adaptability of the soil for pineapple culture.

The prospects for pineapple culture seem good, despite the complaints which are occasionally heard. Some fear has been expressed that the market for canned pineapples is not being developed as rapidly as the output of canned pineapples. This market, however, when properly studied seems to be almost unlimited. The whole west coast of the mainland should be supplied with fresh pineapples from Hawaii. The flavor of our fruit is far better than that of the varieties which they now receive on the Pacific Coast. There is only one factor wanting for the successful occupation of that immense field for our fresh pineapples; and that factor is a business-like co-operative association for the purpose of making known the merits of our fruit by actually distributing this fruit directly to the trade on the west coast. It is scarcely to be doubted that if pineapple growers, familiar with the systems of co-operative marketing in successful use on the mainland, would come to Hawaii and organize a business-like co-operative association along the same line, the markets for fresh pineapples could be developed sufficiently to consume all of the pineapples which could possibly be produced here for years to come.

BANANAS.

At least twenty varieties of bananas now growing in Hawaii, are considered indigenous. The actual origin of some of these varieties may never be thoroughly determined. Altogether, there are about fifty varieties of bananas in the islands, the chief shipping varieties being Bluefield and Chinese. The Chinese banana is grown perhaps more extensively than the Bluefield, but does not endure shipping quite so well. The adaptability of our soil and climate to banana culture is evident from the jungles of bananas which grow wild without care or attention on nearly all of the islands. The banana plant fruits at the age of fifteen to twenty-four months, and is then cut down, making room for the growth of suckers which spring from the ground near the base of the stem. Banana plantations may be allowed to reproduce themselves, by suckering, for two or three years; but the plantation gradually deteriorates unless it is replanted and planted anew. A rotation with other crops, therefore, ultimately becomes necessary, as is also the case with most all of our other money crops. A banana plantation produces 800 to 900 bunches per acre.

The prospects for banana culture in Hawaii are excellent, and the possibility of extending the industry, almost unlimited. The whole Pacific Coast of the mainland should be supplied with our bananas, and Hawaii is properly located to furnish them economically. San Francisco alone, would consume 75,000 bunches of bananas per year. The cooking banana trade has not been touched, in fact on the mainland, cooking bananas are little known; and most housewives have hardly heard of them. With our large variety of excellent cooking bananas, well adapted for shipping, it is high time that the possibilities of trade in this direction be realized by making known the excellent flavor of our cooking bananas. If the banana industry were systematically developed in our islands, the tonnage of this fruit alone would be enormous; and would surely appeal to transportation companies as a matter worthy of their consideration. Practically the only drawback thus far experienced in the banana business is the lack of suitable transportation. Sooner or later it will become necessary to have special fruit steamers for transporting Hawaiian fruit to the mainland. The development of such a traffic

would be of immense importance, not only in the rapid and satisfactory transportation of fruits, but also in furnishing the means of bringing more visitors and settlers to the islands. The influence of the fruit steamers, plying between New York and the West Indies and Central America has already become very conspicuous for this reason. The United States now imports bananas to the value of \$5,000,000 annually; and the banana trade of the whole west coast logically belongs to Hawaii.

MANGO.

We have forty or more varieties of seedling mangoes of all qualities and sizes, and also many introduced varieties from India, the Philippines and elsewhere. Some of the best of these introduced varieties are "Alphonse," "Mulgober," "Totapari," etc. The planting distance of mangoes is about twenty to thirty feet each way, but as a rule, mangoes simply constitute a portion of the ornamental and economic trees in every dooryard. With us, the regular mango season extends from June to August. The trees begin to bear within six or seven years from seed, and thrive best at low altitudes. Mango trees bear very heavily, and the crop from a regular plantation is therefore, large. The fruit will stand shipment in cold storage for a period of a month or longer, and have been successfully shipped from Hawaii to New York and to the Philippines.

There is a growing demand for mangoes on the mainland at good prices. Florida has already seen the profits to be derived from this industry and is pushing it to the fullest extent. As with bananas, and pineapples, so with mangoes, the Pacific Coast trade should logically be supplied by Hawaii. Methods have already been perfected for budding and inarching seedling mangoes with improved varieties, which are certain to make a large place for themselves in any market.

AVOCADO.

This tree grows vigorously on all the islands from sea level to an altitude of 1,500 feet or more. There is a great variety of shapes and colors among the avocados on the local markets, but no well established varieties. It does not come true from the seed, and in order to secure the desired quality of fruit, it is, therefore, necessary to bud or graft the seedling trees. Not only do the shape and color vary, but the flavor is also noticeably different in different forms, as well as the texture. One of the important lines of horticultural work to be accomplished is the establishment of orchards of avocado all budded in a desirable variety. The trees bear within four to six years from the seed, and at the rate of 150 to 500 fruits per tree. The local price of avocado varies from three to twenty-five cents apiece, according to quality, the green fruits, as a rule, being superior to purple avocado. Avocado trees will develop fairly well and bear a reasonable quantity of fruit without any cultivation; but, like other fruit trees, are beneficially affected by cultivation, yielding more fruit of an improved quality. The fruit is easily shipped as far as the Coast. The Pacific Coast market makes greater and greater demands for avocado, and the prices are very remunerative. There is, perhaps, no fruit grown commercially in our islands for which there is a greater possible market development with good profit, than is the case with the avocado. Practically unlimited quantities of uniform fruit of good quality can be marketed on the mainland.

CITRUS FRUIT.

Oranges and other citrus fruits have been known in Hawaii at least since the first visits of white men to these islands. We now have all kinds of citrus fruits, including orange, lemon, citron, lime, pomelo, shaddock, kumquat and mandarin. Orange trees grow wild, and bear heavily of seedling oranges without cultivation or care of any sort. In a few localities, considerable profit has been derived from wild seedling oranges allowed to grow in pasture lands and areas covered with low brush. The quality and flavor of seedling Hawaiian oranges vary considerably, but are often quite excellent. Navel oranges have been grafted on to seedlings and produce large, juicy, fruits of good flavor. As a rule, they do not develop as rich or uniform color as is the case on the mainland. The flavor, however, is all that could be desired. Excellent limes and lemons are grown in all parts of the islands. During 1908 citrus fruits, to the value of \$75,000, were imported into the Territory. With proper marketing facilities, and with a little attention to the cultivation of these fruits, the local markets could readily be supplied with all the necessary citrus fruits from small gardens and orchards on the various islands.

ROSELLE.

The cultivation and use of roselle have been rapidly extended during the past few years. The fleshy, rose-colored calyx of the fruit, and the young seed pod are used in the manufacture of jam and jelly. The plant is well adapted to Hawaii. It produces a yield of 5,000 to 10,000 pounds of fresh fruit per acre. Roselle will endure quite severe drought but naturally thrives better with a reasonable amount of rainfall. In our climate, it seems best to sow the seed in March; replant when the young plants are six to eight inches high, at a distance of 12 feet; and maintain the soil in good tillth. Several local companies are manufacturing roselle jam and jelly for demand, however, is now in excess of the supply. Recently, a manufacturer in California has made request for 10,000 to 20,000 pounds of dried roselle calyxes annually for use in his factory. A price of eighteen cents per pound is offered. The present supply is quite insufficient to fill this one order.

GRAPES.

The climate of Hawaii is adapted for the production of grapes, so that fresh fruit may be had for the table at any season of the year. This can most easily be accomplished by proper cultivation and pruning. At present the grape industry is largely in the hands of Portuguese, who produce grapes for table purposes and also for the manufacture of wine. At least two wineries are now in operation in the islands, one of them being a co-operative enterprise. Not enough attention has been given to the cultivation of grapes to secure a good table fruit. Even in one of the chief grape regions, on the island of Maui, some of the grape vines are allowed to run over trellises, without pruning, until they attain a length of a hundred feet or more. Obviously, with such neglect, good table fruit cannot be expected; and with the absence of cultivation and insufficient sunlight, the sugar content of the grapes is too low. The only variety of grape grown commercially is the "Isabella." A number of other varieties, superior for table purposes, have been tested, and some of them have given good promise. Their cultivation, however, has not been prosecuted in a systematic manner.

COCOANUT.

This is perhaps one of the few palms which is indigenous to the islands. It was propagated for centuries by the natives, being largely in control of the Chiefs. Some of the cocoanut groves, which are now conspicuous features of our landscape, are an inheritance from olden times. Since 1904, there has been a new interest in the planting of cocoanuts, and plantations of this nut are being increased on all of the islands. The cocoanut is one of the most ornamental of tropical trees and should ultimately constitute a fringe along the shore-line of our islands. At least one company is going into the business of raising cocoanuts on a large scale. This seems to be a far-sighted policy, and might well be imitated by others who have interest in other things, and who can wait for the maturing of their plantations.

There is an increasing demand for the products obtained from the cocoanut. Cocoanut oil and butter everywhere find a ready market. The by-product, obtained from the manufacture of cocoanut oil, (and known as cocoanut meal), is valued as a concentrated stock feed and also as a fertilizer. The coir fiber obtained from the husks, is extensively used for cordage, matting and similar purposes; while the consumption of the dried meat of the cocoanut, or "copra," is increasing. The cocoanut seems to require fertile soil, good drainage and the prevalence of winds. In some of our plantations the trees are too close. The planting distance should be not less than thirty feet each way. While our climate is not strictly tropical, but rather sub-tropical, the yield of nuts is nevertheless satisfactory, varying from twelve to 250 nuts annually per tree, or about 12,000 nuts per acre. There is, of course, a long period to wait for income from plantations of cocoanuts; but after they once come into bearing, they require little or no attention except the gathering of the nuts. There are many varieties of cocoanuts in Hawaii, but the Samoan variety is generally considered the most profitable to raise. A few trees of a strictly dwarf variety are known, on which the nuts are borne within three or four feet of the ground. This variety is not only highly ornamental, but a good yielder and a very convenient variety for picking.

VANILLA.

As is generally known, vanilla is the dried and fermented pod of a twining orchid, which requires a tropical climate for its growth. The plants are allowed to climb on a trellis or on the trunks of trees. Propagation is by means of cuttings. The vanilla plant blooms at the third year from planting, and the pods mature about six to eight months later. The flowers require pollination by hand; but this process is readily learned. The curing and fermentation of vanilla pods is a somewhat difficult and complicated manipulation.

There are only two or three commercial plantings of vanilla on our islands, and reliable statistics regarding the yield are not yet forthcoming. The quality, however, is excellent; and the estimated yield, about 120 pounds of fermented pods per acre. At this rate, the money value of the crop should be about \$100 per acre. There are large tracts of land which could be devoted to vanilla, particularly in the Kona district of Hawaii.

PAPAYA.

The papaya is the universal breakfast fruit of the majority of the inhabitants of Hawaii. The trees are found in every dooryard on all the islands. It would seem at first thought, therefore, that everyone's table must be supplied from his own yard, and that there would be commercial market for this fruit. Nevertheless, good profits are being made from the commercial cultivation of papaya. In regular orchards, they should be planted about eight feet apart each way, in well drained and cultivated soils, where an average rainfall may be expected, or where irrigation can be practiced. The papaya bears in about one year from the seed. The apparent varieties are numerous, although few of them have been well established; and the seed does not breed true. The varieties are commonly classified as "long," "half long" and "round." The "long," or Mexican type, is the best in flavor and is a hermaphrodite. The weight of the papaya fruit varies enormously; in some cases the fruits weigh as much as eighteen pounds. The tree, when properly cared for and fertilized, yields a heavy crop of fruit. There is an excellent local market for the varieties of best flavor. If attention were given to the shipping preferences of the papaya, it would be an easy matter to develop a variety, which could be successfully distributed on the Coast. At present the average papaya will hold its texture for only about eight days after picking. On many of the ranches, and in gardens, papayas of poor flavor, and large size, are raised as pig feed.

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