

## **The Avocado in the Philippines**

### **Gumbay Piang**

The avocado was introduced in the Philippines by the Spaniards, but the only tree which lived to be seen after the termination of the Spanish regime was a large tree growing on a plaza in the Walled City, Manila. This tree was destroyed in 1905 by a typhoon.

Nobody knows when the avocado was first introduced in the Islands. Different authorities give different dates. Dr. Elmer D. Merrill, former director of the Philippine Bureau of Science, stated that the avocado was introduced by the Spaniards before 1700; the late Peter J. Wester, world-renowned horticulturnist of the then Bureau of Agriculture (now the Bureau of Plant Industry), said that the introduction was at least twenty-five years before the American occupation of the Archipelago; while G. E. Nesom, then director of the Bureau of Agriculture, mentioned that a Spanish priest from Acapulco, Mexico, brought the avocado in 1890.

The first successful introductions were made in 1903 by W. S. Lyon, then horticulturist of the Bureau of Agriculture. Hawaii, Costa Rica, and the United States were the sources of these early introductions.

Later on thousands of seeds were imported by the Bureau of Agriculture from Hawaii. Budwoods were also imported as early as 1912, mainly from Florida.

### **BUDWOOD FROM POPENOE**

In 1912 Dr. Wilson Popenoe, to whom the world is greatly indebted for his very fruitful long<sup>1</sup> years of avocado explorations, sent budwoods of the Dickinson and Cummins avocados. Budwoods of other named and unnamed varieties were sent from Florida in 1913 by Dr. David Fairchild, now principal agricultural explorer for the United States Department of Agriculture, but most of them did not survive. However, subsequent shipments of budwoods received by Mr. P. J. Wester were successfully grown.

Literature on the avocado issued by the Philippine Bureau of Plant Industry mentions that the Vega was introduced from Santiago de la Vega, Cuba, in 1906; the Commodore, Cyrus, Quality, and Cardinal came from Florida in 1906 and 1907; the Douglas, Family, Pollock, and Wester were sent by the United States Department of Agriculture in 1915; and the Cummins grown at the Lamao Experiment Station, Bataan, was introduced from the Hawaii Agricultural Experiment Station in 1915.

The government began distributing avocado seedlings in 1913. By 1916 there were, aside from those at the Lamao and Singalong experiment stations, a few bearing trees in Manila; one in Lipa, Batangas; one in Imugen, Nueva Vizcaya; and one at Camp Overton, Lanao. Today thousands of trees are found throughout the Islands, although, as Professor Ira J. Condit, of the University of California, says, the avocado here has not passed much beyond the experimental stage of culture.

## VARIETIES

The Bureau of Plant Industry states that not less than one hundred varieties and strains of avocado have already been introduced in the Philippines, out of which about 40 varieties are living and seventeen are bearing.

Those which have successfully fruited here are the Cardinal, Commodore, Cummins, Cyrus, Douglas, Family, Lyon, Miami, Pollock, Quality, Tertoh, Vega, and Wester, with the Cardinal taking the lead in productivity.

Other varieties which are also grown in the Philippines are the Baldwin, Waldin, and Wilson (**West Indian**); the Dickinson, Taft, and Tumin (**Guatemalan**); the Ganter and Puebla (**Mexican**); and a score of unnamed varieties which have yet to be identified.

It should be remembered that the Lyon of the Philippines is not the same as the Lyon of California.

## DISTRIBUTION

The avocado is at home in the Philippines, where the soil and climate are ideal for its growth, and it is now grown in all the provinces of the Islands. There are provinces, however, where the raising of avocado is still very meager; and, as a matter of fact, there are very many localities where the inhabitants do not even know what the avocado looks like. In a few provinces avocado raising is becoming an important horticultural enterprise.

The Bureau of Plant Industry, in a letter dated March 25, 1936, says:

"There are now bearing avocado trees in many provinces of the Archipelago, particularly in Bataan, Batangas, Bukidnon, Cavite, Laguna, Negros, Mountain Province, Rizal, etc. In Batangas not less than 1,500 trees and in Cavite about 2,000 trees were already planted.

"... We have no record as to the annual production of fruit but our avocado fruits are mostly produced in Batangas, Cavite, and Laguna provinces.

"We know so far only one planter . . . who is specializing this crop. He has already planted over 400 trees in Talisay, Batangas.

"One or two trees of the forty existing varieties were planted at the various experiment stations of this Bureau.

"The Bureau of Plant Industry is at present conducting various experiments on avocado, and propagating seedlings and budded plants for distribution to the farmers."

## LETTER FROM U. OF P. I.

The following letter from the College of Agriculture, University of the Philippines, shows the status of the avocado in that institution:

## DEPARTMENT OP AGRONOMY

April 1, 1936

Dear Mr. Piang:

Referring to your letter of the 10th inst, Dr. L. G. Gonzales, who is in charge of our fruit work, has furnished the following answers to your questions, number for number:

1. A few seeds were planted in 1912. More plants were set out from time to time.
2. We have at present 250 avocado plants of which about 50 are fruiting. We had more trees fruiting a few years ago but due to the typhoons of last year, many plants were killed. Area of land planted to avocado—2 hectares. (About 5 acres.)
3. Our trees are mostly from seeds so that they are not really named varieties. The naming of these is being made as fast as we find justification for doing so. Only the promising ones are being named. We have to-date College seedlings Nos. 1 to 6. We also have 1 tree of Douglas; 2 trees Lyon; and 2 trees Cyrus.
4. The yield varies from a few fruit to as many as 600 per tree.
5. Some of the fruits are sold locally and some are used for experimental purposes.
6. The price varies from sixty centavos<sup>1</sup> per kilogram during the earliest and latest part of the season to twenty centavos during the height of the season. There is always a good demand for the fruit.

Very truly yours,

N. B. MENDIOLA,  
Head Department of Agronomy.

Aside from the eight provinces mentioned in the letter from the Bureau of Plant Industry as leading avocado growers, which probably have an average of around 1,500 trees, there are forty-one other provinces in the Archipelago, not including the City of Manila. If there is in each of these forty-one provinces, which have not yet started raising avocados on a big scale, an average of but 250 trees", the Philippines should have today not less than 22,000 avocado trees growing.

### PRODUCTION

**Seedlings:** While propagating by either grafting, budding, inarching, or mar-cotting is recommended and encouraged by the schools and the Bureau of Plant Industry, the common practice throughout the Philippines is to plant the seeds directly in the field or in bamboo tubes in the farmer's nursery.

There is no commercial nursery in the Islands devoted to the raising of fruit trees. The Bureau of Plant Industry has a limited quantity of seedlings of some tropical fruit trees which it sells to the public. Avocado seedlings cost fifty centavos each, while budded plants sell at a peso<sup>3</sup> apiece.

As a general rule, no attention is given to variety.

**Cultural practice:** The avocado will thrive in all parts of the Philippines, provided the soil is well drained. Particularly in the typhoon regions, a windbreak is another very essential requirement.

The avocados are set in the field 8 to 10 meters apart, preferably during the beginning of the rainy or wet season. If the seedlings are grown in bamboo tubes, the tubes are split and removed without disturbing the root in transplanting. On the other hand, if the seedlings are raised in nursery plots, they are dug up with balls of earth. After transplanting, the soil around each plant is packed firmly and then generously watered.

As a rule the farmers do not realize that the avocado has a flower behavior peculiar from those of other fruit trees. They do not know that interplanting of reciprocating varieties, varieties which have their flowers open at such a time as to allow cross-pollination, is very essential to the successful fruiting of the avocado.

The failure of trees planted singly to fruit successfully was observed by government horticulturists at an early date, as early as 1907, when G. K. Nesom noted the cause for the failure of a matured, lone tree to bear fruit. However, it was only last year that a study on the flower behavior of different varieties grown in the Philippines was concluded and published, by Francisco G. Galang and Emilio K. Morada, horticulturists of the local Bureau of Plant Industry.

This investigation was patterned after the works of A. B. Stout, T. Ralph Robinson and E. M. Savage, B. S. Nirody, and others who have made valuable research work on the flowering habit and pollination of the avocado.

Cultivation, irrigation, fertilizing, cover-cropping, mulching, and pruning, while advocated by the Bureau of Plant Industry and the schools, are seldom, if ever, practiced by the farmers. This is probably due to the fact that the typical Filipino farmer practices a highly diversified system of farming—although in a very small way, with only a few of each kind of fruit trees on the farm. There is, also, Mother Nature who is quite generous to the tropical farmer, particularly the farmer in the Philippines.

<sup>1</sup>There are only around 250 avocado trees in the province of Cotabato, which is as large in area as the combined areas of the counties of San Diego, Orange, Los Angeles, and about a third of Ventura—the greatest avocado center of the world, from the standpoint of scientific production and marketing. Although it is the largest province in the Philippines, containing an area of 9,620 square miles, Cotabato's population of about 230,000 is less than the average (275,000). The highlands and a greater portion of the plains are ideal for avocado raising, but the introduction of crops of foreign origin, such as the avocado, has started only very recently, much later than most of the smaller provinces.

<sup>2</sup>One centavo is equivalent to one-half cent, U. S. currency.

<sup>3</sup>A. peso is equivalent to one-half dollar, U. S. currency.

## **PESTS AND DISEASES**

The following is quoted from Farmers' Circular No. 1 of the Bureau of Plant Industry, regarding pests and diseases of the avocado:

There are comparatively few insect pests and diseases which at present affect the avocado in the Philippines. Among the insects, the borers and the scale insects, including the mealy bugs, are found destructive to our avocado trees. Other pests are the thrips, caterpillars, and white ants.

The borers are found to attack the trunk, pith, and twigs. They work their way downward destroying all growth thereby, and may eventually kill the tree. Lime wash may lessen the infestation.

The caterpillars attack the leaves and flowers. They can be controlled by spraying either with lead or calcium arsenate.

The thrips attack the flowers but they can be prevented by dusting with pyrethrum or tobacco dust.

The scale insect sucks the sap of twigs, leaves, and fruits. Heavy infestations weaken the tree, and sometimes cause premature falling of fruits. Oil emulsions and soapsuds usually are effective in controlling the scales.

Our common diseases of avocado are the die-back and anthracnose. The anthracnose is a disease of the leaves, bark, and fruit. The affected portion turns black with sunken spots, usually circular in form. It can be controlled by spraying with Bordeaux mixture. The infected parts should be cut and burned.

The die-back is a disease of the twigs. The infected parts become dry. It can be prevented by spraying the trees with lime sulphur or Bordeaux mixture. These sprays should be applied periodically once every two weeks at least as the new flushes appear until they mature.

Other diseases of minor importance which may also be controlled as the die-back are the scab and the leaf spots.

**Yield:** The avocado is in season the greater part of the year. It is possible to produce avocado fruits throughout the year by planting varieties which fruit at different times.

The yield per tree varies greatly, ranging from a few fruits to as many as six hundred—sometimes reaching a yield of 1,200 fruits. The average market price for them ranges from ten to twenty pesos per hundred.

So far no statistic as to the number of trees, area planted, and annual production of fruit has been gathered.

## **INVESTIGATIONS ON STORAGE AND UTILIZATION**

The government has been conducting research work on the storage and utilization of the avocado, among other fruits. Adriano, Valenzuela, and Miranda, working in the Bureau of Plant Industry on the quick freezing of Philippine fruits, found out that avocado can be successfully preserved by freezing:<sup>4</sup>

Halved, quartered, and sliced avocados frozen in 50 to 70 per cent syrup retained the flavor, color, and texture of the fruit. The different containers used in the freezing of avocados—namely, the sanitary and slip-cover cans and the cartons—were found to be satisfactory. Surface discoloration is present in some of the samples. This can be greatly minimized by entirely submerging the fruits in syrup and packing them under vacuum. For this purpose, sanitary cans that can be sealed under vacuum would be the best type of containers for avocados.

Avocados in syrup frozen at 0°F. and stored at 18°F. have a slight surface discoloration after three months in storage, but the color underneath is good. The flavor and texture are satisfactory. Those frozen at 40°F. and later stored at 18°F. are better in texture and flavor than those frozen at 18°F. Storage of the frozen avocados at a lower temperature, say not above 10°F., will preserve the color, flavor, and texture of the fruit better. Avocado pulp passed through a grinding machine and packed with powdered sugar in the proportion of 2:1 gave a product suitable for ice cream and sherbets. Taken alone or with cream, it makes a very nice frozen fruit dessert. The pulp should be packed immediately after crushing to prevent much darkening due to oxidation.

Professor N. B. Mendiola, of the College of Agriculture at Los Baños, wrote on March 2, 1936:

In our studies on the storage temperature requirements of the avocado, the following summarized results were obtained:

Of 5 temperatures tested: 0°, 10°, 15°, 20°, and 27.5°C., 10°C. proved best. Mature but not ripe fruit remained in good condition from 20 to 30 days. The fruit ripened in about 15 days from storage. At 0°C. the fruit remained hard and finally became black without ripening. At 15°C. the fruit ripened in about a week and kept in good condition for one more week. At higher temperature the fruit ripened and rotted much sooner. At room temperature, ripening took place in 5 days and in 5 days more, the fruits began to decay.

In its Utilization Laboratory, the Bureau of Plant Industry made jam and paste from avocado, as follows:<sup>5</sup>

**Jam.**—Pulp 2 regular-sized fruit, add one can milk and sugar to taste. Pass through a fine sieve and then heat to jam consistency.

**Paste.**—Continue the heating of the jam to paste consistency. Then spread the product on a piece of board dusted with white crystalline sugar and divide as desired.

The people of the Philippines are gradually realizing and appreciating the value of avocado as a fruit crop. The government has been popularizing it through the schools, community assembly lectures, bulletins, and the press. There is no doubt but that the avocado will find its way into every Philippine home with favor.

<sup>4</sup>Philippine Journal of Agriculture, Vol. 4, No. 1.

<sup>5</sup>Bureau of Plant Industry Contributions to Knowledge of Philippine Agriculture, 1931, page 69.