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Avocados From the Growers' Standpoint

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In the subject assigned to me, namely, "Avocados from the Growers' Stand point," there is room to cover so many phases of the avocado industry that I may not hit upon some point which should be brought out, but will doubtless touch upon some points that will be of interest to some.

In the first place, the question may be asked why anyone in Florida should grow avocados. The answer from a business standpoint is, *for profit.* As the growing and marketing of avocados is a comparatively new industry, the average grove man must be shown that he not only can make a profit out of the venture, but he must be assured that there is a chance to make a greater profit than he can usually make from growing citrus, truck crops, or following some other well established business with which he is familiar.

He will doubtless realize that if he is raising citrus and has good land, suitable for growing avocados, that it may be better to raise some of each crop than depend upon either one alone.

If he is a cautious man he will not only investigate the chance of making profits, but will also look for factors which might cause him to make a failure and consequently lose money on the venture.

If he gives careful consideration to the following points he will reduce his chance of making a failure in the Ridge section:

1) Select a well protected, warm location, well drained, and having good air drainage. A hill side on the southeast side of a large lake is desirable;
2) Select hardy varieties of proven value;
3) Provide irrigation if possible;
4) Use cover crops and plenty of stable manure or fertilizer high in organics.

For a crop which is so expensive to bring into bearing as an avocado grove, it is well worth while to select the best and safest place possible, even though it costs twice as much as an average location, which does not have natural advantages for frost protection. This deserves far greater consideration than is usually given, and is of prime importance, since our best avocados will not stand as much cold as citrus.

In the selection of hardy varieties, the writer believes that some of the Guatemalan type hold more promise for this section than the West Indian varieties. The Collinson, Winslowson, Lulu, Walden, Taylor, Taft and Eagle Rock are varieties that have proven themselves to be good for the Ridge. There are others which look promising, as the Spinks, Panchoy, Itzamna, Queen, and Linda. Where well protected the Trapp and the

Pollock should also be grown.

The question of root stock for avocados for the Ridge should be studied much more carefully. It will undoubtedly influence the amount of cold the grafted tree may stand. In Florida the Mexican root has not proven as satisfactory for West Indian scions as vice versa. The West Indian furnishes a splendid stock, as it has an enormous. Root system and grows off rapidly but will not produce as hardy a tree as a Guatemalan root or a Mexican stock. Popenoe states the Guatemalan grows well on West Indian stock, but perhaps even better on Guatemalan stock. Simmons, formerly of the U. S. Plant Introduction Gardens, at Miami, has found that the Gottfried is a splendid stock for both West Indian and Guatemalan varieties, and told the writer he would recommend the planting of a few Gottfried trees, to get seed for raising seedling stocks for use in the Ridge. The Gottfried is a rapid grower, has wonderful root system, and is very hardy. It has not been injured by cold at all in Avon Park section during the last few years. The Gottfried produces a nice fruit for home use, in addition to being good as a root stock.

H. J. Webber, of California, reports that during the winter of 1916-17, at 30° F. nothing was injured so far as could be seen.

29° F. No serious injury. Only traces on most tender growth of West Indian and Guatemalan types.

28° F. Guatemalan leaves scorched. Considerable damage on West Indian.

27° F. Mexican varieties with new leaves slightly scorched Guatemalan with all new foliage injured, and West Indian badly damaged.

24° F. Some dormant Mexicans uninjured; Guatemalan badly injured; West Indians killed.

21° F. All Guatemalan varieties killed to bud; a few of the hardiest Mexicans had young leaves only injured.

Krome reported, from Homestead, that, "As a rule, West Indian avocados, beyond one year old, will not be damaged by a temperature of 32° unless that temperature holds for a longer period than two or three hours. When four or five years old they will stand 26° F. without injury, except to tender growth, but below that temperature there is likely to be considerable damage. At 22° five-year-old Trapp trees were killed back to wood one inch in diameter, while Guatemalans suffered little damage besides singeing of leaves."

At Avon Park, two-year-old trees that were given clean cultivation in the fall were not injured at all by a temperature of 27°, whereas others which had Crotolaria, beggarweed, and grass growing in the middles had the leaves and tender shoots damaged.

During the winter of 1926-27 tender growth was killed on the West Indians, and some of the Guatemalans at a temperature of 25°, but the Mexicans were unhurt.

Of the varieties showing the greatest cold injury was the Hawaii, Sanchez, Linda, Spinks, Eagle Rock, Collinson and Lulu, in the order named. Pollock trees grafted from a bearing tree that had withstood the 1917 cold were not injured as much as Collinson or any of several Guatemalans. The Winslowson showed little damage. Panchoy, Taylor, Queen and Taft stood cold slightly better than Collinson. Gottfried and Puebla

were not injured.

In 1927 the writer thought some young trees were badly injured, and cut off all at the bank except twelve trees. Later it developed that the twelve trees left without pruning were not severely hurt and the twigs died back but about six inches, though two days after the cold it looked as if they were ruined. Six hundred trees were cut off about fifteen inches above the ground which should have been left alone for several months. But four of the six hundred trees cut off died from the severe pruning, but some growth was lost. Leave trees alone when damaged by cold for several months and then remove the dead wood. For some unaccountable reason, some West Indian trees budded on West Indian stock were not as severely damaged as West Indian seedlings.

The two factors which affect growth most are moisture and fertilizer. While the avocado likes a well drained soil, it thrives best when supplied with plenty of moisture. It may develop that overhead irrigation will be proven very profitable; but there has not been experience enough to decide this point.

Stable manure, cover crops, and fertilizer high in organics are essential to rapid growth. Beware of the use of nitrate of soda unless in very limited quantities.

Studies in cross pollinization are being made. At present it is safe to advise planting different varieties adjoining each other. This may be done by planting a variety in alternate rows. The writer plants each row to a different variety from the row on either side, so each row may be pollinated by two other varieties. Indications are that the Spinks will be exceedingly valuable in fertilizing other varieties. It blooms very profusely and trees of other varieties seem to bear heavier when growing next to a Spinks tree. Other varieties may prove very valuable for this purpose.

One of the first questions asked by a prospective avocado grower is, "What will it cost per acre to grow trees to bearing age or to four years of age?" To get information on this subject, Mr. R. A. Carlton, Agricultural Agent of the Seaboard Air Line Railway, has compiled figures from eighteen separate groves on the East Coast, and the figures are given herewith:

ACRE COST OF AVOCADO GROVE DEVELOPMENT UP TO AND INCLUDING THE FIFTH YEAR—MIAMI-HOMESTEAD DISTRICT

Land	$150.00
Clearing land	86.39
Scarifying and removing rock	58.33
Trees—101 at $1.25	126.25
Setting	109.16
Total initial cost	$530.13
Interest at 8 per cent for five years	$212.05
	$742.18

	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.
Fertilizer	$18.21	$32.41	$55.75	$80.53	$108.19
Hauling and applying fertilizer	1.25	1.75	2.96	4.28	5.59
Harrowing	8.76	8.94	8.76	8.18	8.12
Spraying	2.62	3.15	9.07	12.26	12.73
Pruning	.....	.....	.....	1.22	1.89
Hoeing	13.91	13.37	13.42	12.89	12.13
Mowing	3.65	4.06	4.65	5.35	4.53
TOTALS	$48.40	$63.68	$94.61	$124.71	$153.18
Interest on maint'nance chg.	19.35	20.36	22.68	20.00	12.25

*Total Maintenance Cost per acre	$ 599.22
Grand Total Cost Per Acre	$1,341.40

*$20.00 added to this amount for taxes and unclassified items of expense.

Entire credit for this work is due Mr. Carlton, who was kind enough to permit me to use these figures in advance of their publication by his organization.

The writer has kept careful cost of the production of twenty acres of avocados at Avon Park on high pine land. The cost is as follows on a basis of one hundred trees per acre:

Cost of land, per acre	$150.00
Cost of clearing land, per acre	30.00
Cost of 100 trees	125.00
Cost of staking grove, digging holes, planting trees and shading them, per acre	40.00
Watering trees, first season, per acre	15.00
Stable manure, 30 lbs. in hole for each tree at $5.00 per ton—per acre	7.50
Commercial fertilizer—2 lbs. per tree first season—per acre	4.50
Seed for cover crop, planting same, cultivation of tree rows, plowing under cover crop, harrowing, and banking trees, per acre	19.00
Total cost at end of first year	$391.00

Each year a heavy cover crop of cowpeas or Crotolaria has been grown on the land and plowed under, with the result that the third year but seven and one-half pounds of commercial fertilizer was used during the year, this being divided into three applications, and the trees were in very vigorous growing condition. It was estimated that the

Crotolaria plowed under green would have weighed at least ten tons per acre, hence an enormous amount of humus was put back into the soil. The cover crop was so heavy a mule team could not be forced through it, and it had to be broken down and cut with the tractor and disc harrow. It required from four to six discings to cut it up thoroughly.

The greatest saving in the cost of a grove on the Ridge as compared with the East Coast, was in clearing the land, no cost for scarifying and removing the rock, and in setting the trees. The cost of a grove at the end of the first year was about $187.00 per acre less on the Ridge than on the East Coast.

The cost of growing this grove for each year after the first until four years old was about the same as for the East Coast. Not as much fertilizer was required, but some trees which did not grow off well had to be replaced, which offset that saving. If interest was charged on the investment there would be an additional saving as the initial cost was less.

There have not been enough groves brought into bearing on the Ridge to give very definite figures on the return which may be expected. One grove at Lake Placid is bearing for the first time this year, and the fruit has sold from January 1st to April 1st, 1928, for $9.00 to $12.00 per dozen.

On the East Coast the growers report prices of $18.00 to $35.00 per crate for their fruit, which ripens from Nov. 15 to May 30 and much less for summer and early fall fruit. Mr. Herman of Coconut Grove reports as much as $1,700.00 worth of fruit per acre from old trees. George B. Cellon, of Miami, has reported Trapp trees from seven to ten years old bearing from five to ten crates of fruit, counting forty fruit to the crate. Krome reports that his Trapp trees, five years of age average about two and one-half crates per tree. Other growers on the East Coast have estimated that mature groves will produce up to five hundred crates per acre.

The profit to be expected per acre will doubtless be discussed by someone with far greater experience than I have had, hence I will not attempt to discuss this phase of the subject.

The growing of avocados in the Ridge is still in the experimental stage and much is yet to be learned. There are some things we have learned from the experience of many growers in the last ten years. One important thing is that a large percentage of the trees that have been planted are Fuertes and they have been very unsatisfactory. In California they have been one of the best varieties, but in Central Florida they have been shy bearers, have failed to carry most of their fruit to maturity, what fruit has matured has ripened unevenly, a portion becoming ripe while the upper part of the fruit is still unripe or green, and this variety seems especially subject to black spot or rot. Until these difficulties are overcome the grower will do well to leave this variety alone or to plant very few of them.

We have learned that contrary to the opinion of some, avocados will not do well on low, wet land, especially where the water table is close to the surface during some parts of the year. The grower will be disappointed who plants on such land.

We have learned that avocados grow exceedingly well on our sand hill land, especially where given plenty of humus and water. Every home should have one or more trees, as

they grow exceedingly well in the back yard, for they are better protected there, and the danger from cold damage is small.

We realize that while there is a great deal yet to be learned about the business, and many new varieties must be tested out before we can definitely recommend the best for our section, that the business looks very encouraging, and if especial care is used in selecting a location and in the selection of proven varieties, and the grove is given good care and close study by the owner, the production of avocados in the Ridge has a very bright future and the acreage will doubtless increase very rapidly.