

FLORIDA AVOCADOS — BY A CALIFORNIAN

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INTRODUCTION

About 6,500 of Florida's 6,800 acres of avocados are located in the southern part of the state in Dade County (1). The Florida avocado industry reached its peak during the mid-1950's, but acreage has since declined following freezes and hurricanes. Production in 1962-63 amounted to about 30,800,000 pounds with a value of \$2,200,000. This was about 20% of the total United States' production.

HISTORY

The first recorded avocado importation was in 1833 by Henry Perrine, but the Spaniards probably introduced it even earlier (8). By 1900 there were several commercial groves of West Indian seedlings near Miami. The first commercial planting of budded trees was 20 acres of the Trapp variety near Miami in 1906. Some Mexican variety budwood was imported from California in 1902. Guatemalan seed were imported by the United States Department of Agriculture in 1904-06. Importations from California, Mexico and Central America have continued, but most of the acreage is planted to varieties of Florida origin—most of West Indian, Guatemalan or hybrid selections.

DISTRIBUTION OF PLANTINGS

In 1959, 34 of Florida's 67 counties reported some avocado production (5). Most of the acreage was in Dade County, but there were important groves in Highlands, Brevard, Polk and Pinellas Counties. Smaller groves were reported in Citrus, Duval and Washington Counties.

After the 1962 freeze, and at the present time, Dade County is the only important avocado county in Florida (Fig. 1). Over 98% of the total production of the state is in this one county. There are still scattered groves in Highlands, Pinellas and Brevard

Counties. There are dooryard plantings in many of the counties from the middle of the state, south. Scattered trees are found as far north as St. Augustine and Gainesville (Fig. 2).

Since there are a few scattered trees even out on the Keys, avocados are grown in Florida from below latitude 25 degrees in the south to approximately 30 degrees in the north—the majority at approximately 25.5 degrees (Fig. 1). This, in comparison with California, where most of the avocados are grown between approximately 33 degrees north latitude in San Diego County to 35 degrees above Santa Barbara. There are some commercial plantings as far north as Oroville, California—which is approximately 39 degrees latitude.

DADE COUNTY

Metropolitan Dade County is one of the youngest and fastest-growing major metropolitan areas in the United States (3). Between 1890 and 1962—a span of 72 years—the population increased from 861 to more than 1,000,000 people. By 1985 it is predicted that the county will have approximately 2,433,000. Their population expansion is very similar to many areas in California in that much of the land needed for urban use is now in agriculture—including avocados.

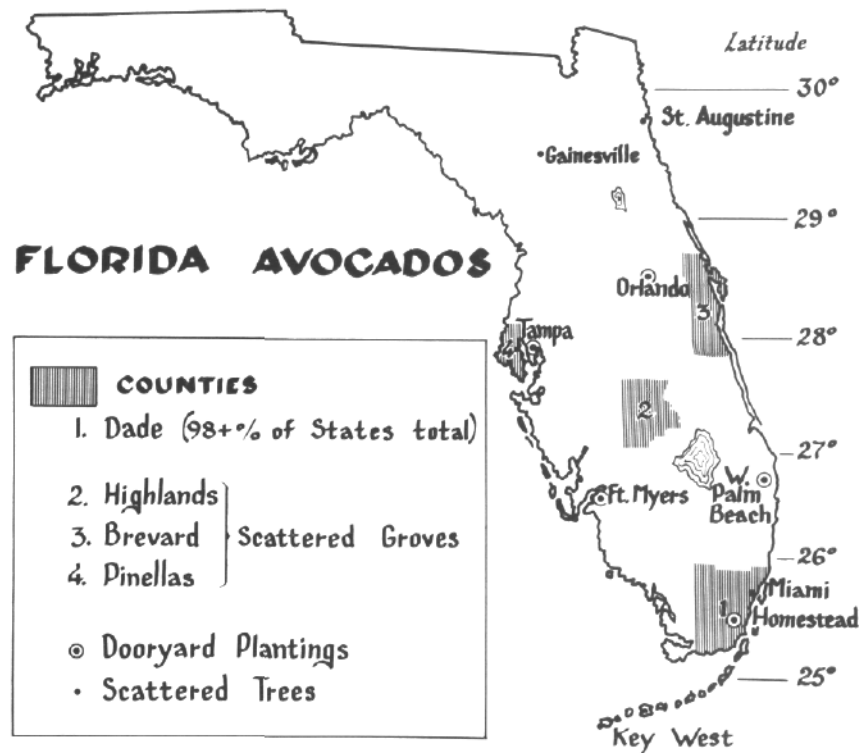


FIGURE 1. Map showing Florida avocado plantings.

SEASON AND MATURITY

In Dade County, where most of the avocados are grown, the season for avocado fruit maturity is summer, fall and early winter (6). The heaviest production is in the fall. During the summer, avocados are in short supply—mainly because of a lack of good commercial varieties. In Florida, maturity is based on a specific date and the size or weight of fruit rather than on oil content (8).

VARIETIES

West Indian varieties formerly predominated in Florida, but in recent years Guatemalan-West Indian hybrids have been more popular (8). Lulu, a Guatemalan variety, has accounted for about 25% of Florida's total production since 1955. The ten principal varieties for the 1964-65 season in order of their total yields were: Lula, Booth 8, Waldin, Pollock, Booth 7, Hickson, Booth 1, Monroe, Fuchs and Booth 3 (2).

Generally the large-sized fruits, like the Pollock (Fig. 3), have been more popular with growers in Florida; but there is growing interest in some of the smaller varieties.

One of the problems that Florida avocado growers have is that of too many varieties and seedlings. Together with the approximately ten leading varieties, there are also some 40 other varieties and numerous seedlings (8).



FIGURE 2. Mexican-type avocado tree growing on the main campus, University of Florida, Gainesville. This unnamed tree is over thirty years old and has survived the freezes of 1957 and 1962.

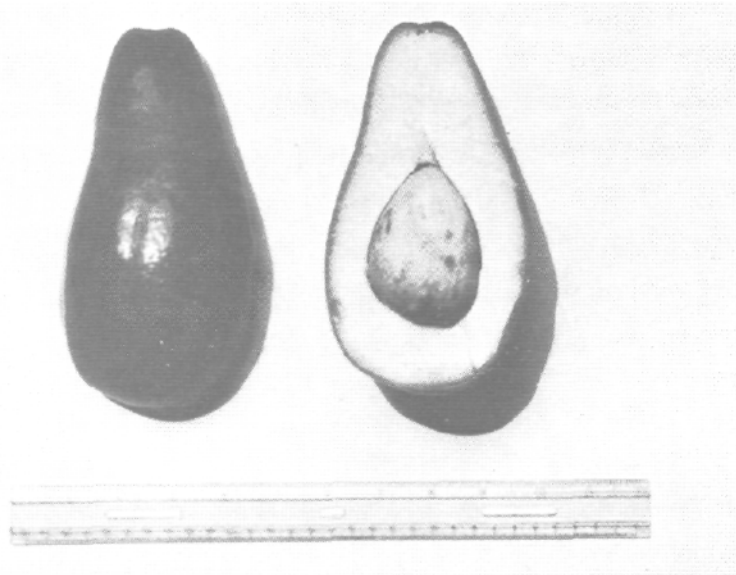


FIGURE 3. Pollock variety fruit from Dade County. Fruit are very large—sometimes over 40 ounces. Skin is smooth, light glossy green. Fruit mature from July to September.

Lulu—this most popular variety came from a tree in Miami which reportedly was from a seed from the original Taft tree at Orange, California (8). The Taft is Guatemalan, but the pollen parent is unknown. The tree fruited in 1919 in Florida and was propagated commercially in 1921. The fruit are pyriform or occasionally necked, medium-large (14 to 24 ounces), with a nearly smooth, light-green skin. Oil ranges from 6 to 15% and the season is mid-October to mid-January. The tree grows rapidly with an upright habit. Although the Lula is susceptible to disease and subject to wind damage due to its tall habit of growth, it has proved satisfactory both in the Ridge section of Central Florida and on the lower East Coast.

SOILS

The avocado is grown successfully on a wide range of soils in Florida, including the sands of the Ridge, the limerock of Dade County, and the muck of the Lake Region (8). In Dade County, most of the avocados are grown on the soils of the Rockdale series. As can be seen from figure 4, this "soil" is mostly pulverized limestone. These soils are underlain with a porous limestone and are well-drained (4). However, since the elevation above sea level ranges from 8 to 14 feet, there is often a high-water table. During periods of high rainfall or hurricanes, the surface of much of the county may be covered by water two to 60 inches deep for many days.

The soil reaction ranges from pH 7.0 to 8.0. The organic matter content is low and the native vegetation consists of pine, palmetto and grasses.

A few groves have been planted on the Perrine marl soils. Since these soils are generally lower than the Rockdale soils and the surface and subsurface drainage is poor, few avocado growers have risked planting these soils.

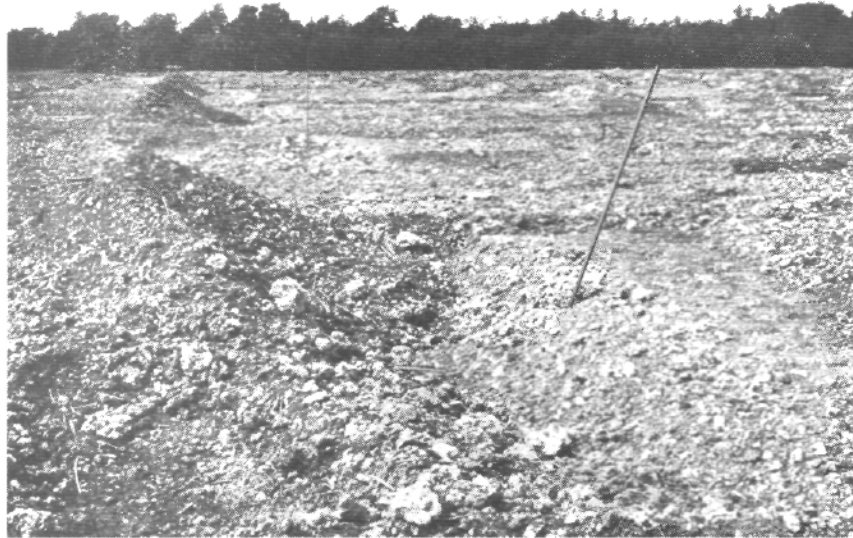


FIGURE 4. Typical Dade County soil prior to planting avocados. This Rockdale series soil is well drained, but must be scarified before planting is possible.

DISEASES

There are a number of avocado diseases that damage avocados in Florida. The main ones are: Cercospora spot, Anthracnose, Avocado Scab and Stem-end Rot—all caused by various fungi (8). Regular copper fungicidal sprays are necessary to control these diseases (Fig. 5). Some Lula avocado trees require three copper sprays each year to control scab—in addition to two spray applications for cercospora control.

Avocado root rot has been found in Florida and has damaged some trees (8). In a recently completed avocado soil and root rot survey of Dade County by the author and others (in press) the fungus *Phytophthora cinnamomi* was found in a number of avocado groves, but does not appear to be as serious a problem as in California and many other avocado-growing areas (10).

Some other minor diseases include: Verticillium wilt, Powdery mildew, Algal spot and Cankers. Sunblotch has been observed a few times and was probably brought to Florida from California on propagating material (8).



FIGURE 5. Fungicidal spray application to avocado trees in Dade County. Trees have been hedged and topped.

INSECTS

Wolfenbarger (9) in 1963 considered about a fourth of the two dozen insect and mite species attacking Florida avocados were economically important. The most common pest is the avocado red mite, *Oligonychus yothersi* (McG.), which can cause the leaves to become reddish colored. A severe infestation can cause heavy and premature leaf fall.

Other economically important insects include: Dictyospermum scale, avocado tree girdler, greenhouse thrips and tortricid moths. There are a number of other insects that can be a problem at times.

NEMATODES

The burrowing nematode, *Radopholus similis* (Cobb) Thorne, and a meadow nematode, *Pratylenchus pratensis* (de Man) Filipjev, were reported on avocados by Du Charme and Suit in 1953 (8). These two nematodes appear to be a problem to avocados only on sandy soils.

In the course of an avocado soil and root rot survey in Dade County (in press) the author and co-workers identified reniform nematodes, *Rotylenchulus*, sp. in three samples. In one sample from a tree in very poor condition these nematodes were numerous enough to have contributed to its condition.

CULTURAL PRACTICES

Cultural practices such as irrigation, fertilization, cultivation, and propagation of

avocados in Florida often seem unique to a Californian.

Irrigation—which is very important and necessary in avocado groves in California, is practiced in relatively few groves in Florida. As late as 1958 (8) it was still only recommended as supplementary, even for young trees. This was, of course, mainly because of an annual rainfall of approximately 60" in Dade County (3). However, this rainfall is not always spread evenly throughout the year—the winter months of November to March are usually dry. The author talked to a few growers that observed improved production and tree growth by sprinkler irrigation—usually of the overhead type.

Fertilization—of avocado trees in Florida is considered expensive and many of the recommendations are based on fertilizer programs developed for other crops (7).

The Rockdale soils in Dade County are very low in most plant nutrients as virgin soils and when newly scarified have a tendency to fix phosphates, copper, zinc, manganese and iron (8).

Popenoe (7) in 1963 reported that in one experiment in South Florida on avocados, two pounds of nitrogen per tree annually was inadequate and that three pounds was probably the minimum for South Florida.

With the exception of iron deficiency, symptoms of micro-element deficiencies can be corrected generally by foliage sprays (8).

Cultivation—for weed control was practiced in many avocado groves of Florida—especially on the more sandy soils (8). Many groves on the limerock soils of Dade County have a permanent ground cover of grasses and weeds which is mowed periodically.

Propagation—of avocado trees in Florida is primarily by grafted seedlings grown in containers (Fig. 6). One of the most popular root-stocks is the relatively large-seeded West Indian race Waldin variety (8). Mexican seedlings are not popular in Florida due to lack of uniformity and problems of compatibility with West Indian scions.

Grafting is preferred rather than budding and the side-graft is one of the most popular methods (Fig. 6).

Tarpaper containers similar to those used by some California nurserymen are used generally; however, some nursery trees are grown in metal cans and there is some interest in polyethylene containers (Fig. 6). In Florida there are almost 110 commercial field-grown avocado nursery trees.



FIGURE 6. Avocado nursery trees at Goulds, Florida. These Waldin variety seedlings in polyethylene containers have just been side-grafted.

Planting—of avocado trees in South Florida is very unique. Due to the rocky soil, extensive scarification and pulverization by heavy equipment is necessary before planting (Fig. 4). In the past, tree planting holes were blasted by dynamite (8). The use of heavy-duty trenching machines is also becoming popular for planting avocados—and limes—in Florida.

Production costs—average approximately \$250.00 per acre on bearing avocado trees in Dade County. This includes fertilization, irrigation, spraying and mowing.

INDUSTRY PROBLEMS

Some of the major problems facing Florida avocado growers include: 1) marketing; 2) urbanization; 3) labor; 4) natural disasters; 5) increasing production costs; and, 6) low yields (1).

Marketing problems are complicated by the lack of effective coordination of marketing on an industry-wide basis, needed production and market information, and too many varieties of various shapes, sizes and quality. The relatively short season—mainly September to January—means not only a less efficient use of equipment, but this maturity season often coincides with the "hurricane season." In September of 1965 it was estimated that hurricane Betsy blew approximately 90% of the South Florida avocado crop onto the ground—also hundreds of avocado trees were blown over and had to be reset.

FUTURE GOALS

The University of Florida in 1965 (1) predicted that for the next ten years, Florida

avocado acreage and production will remain at present levels. New plantings will offset that lost to subdivisions, freezes and hurricanes. New avocado plantings are not expected in the more sandy soils as long as citrus is economically sound.

SUMMARY

Florida's avocado industry totaling approximately 6,800 acres— 6,500 in Dade County—does not appear to be dynamic. A number of factors for this lack of expansion are described. Florida's avocado industry differs appreciably from California's in such things as soils, varieties, irrigation, insect and disease control, marketing, maturity standards, total acreage, climate and, especially—hurricane potential. However, both states have similar problems such as increasing production costs, rising taxes and encroaching urbanization. It should also be remembered that California and Florida furnish almost all the avocados consumed in the United States.

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