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AN AVOCADO PLANTING ON FLATWOODS SAND WITH DRIP IRRIGATION

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Abstract

An avocado planting of 94 gross acres was made in May-June, 1973. The predominant soil types are Sunniland, Immokalee, and Leon fine sands. The land was bedded and ditched to facilitate drainage. On a setting of 18 ft. x 27 ft. were set 'Simmonds', 'Pollock', and 'Tonnage', 'Monroe', 'Peterson', 'Ruehle', and 'Hall' varieties. Prior to planting, a drip irrigation system was installed to water the young trees.

A 94 acre tract of land was planted to avocados in late May and early June, 1973, on properties of The Collier Company lying in Collier County, Florida. The principal soil types of this tract are Sunniland, Leon, and Immokalee fine sands. In its native condition, the land supported palmettos, gallberries, and other vegetation typical of the soil types and land area. It was cleared of native vegetation in 1958 and farmed until 1963, producing the various vegetable crops grown in the Immokalee area. In 1963 it was seeded to Pensacola Bahía gass and utilized as improved pasture until early 1973 when preparations for avocado planting were begun. This tract lies on the east side of the Okaloacoochee Slough, a well-known watershed in east Collier County. It has about 18 inches fall in elevation per mile toward the slough, being very flat sandy land.

Land Preparation. In order to provide the drainage necessary for growth of avocados, a network of canals and single-row beds were established with an outfall canal to the Okaloacoochee slough. This network of beds and canals is very similar to drainage work for citrus in various parts of south Florida and is commonly known as a 'single-row bed and swale system". However, the single-row beds in this project are higher than those in general use for citrus, and the ditches are deeper and closer together than normally is the case in flat-land citrus groves. The beds average 20 inches height or better from the water furrow. The canals are 284 ft. apart and were cut seven feet deep. The beds are 27 ft. apart, center to center, and there are nine rows between canals.

Prior to bedding, the land was disced north south and east-west with a large heavy set of disc-harrows to thoroughly cut up the heavy bahía grass turf that was present. The bedding was done by motor grader, blading topsoil out of the water furrows onto the top and center of the bed. The canals were cut by backhoes with buckets in the shape of the canal cross-section, which buckets do an excellent job. The main outfall canal runs east west along the south perimeter of the tract and is connected to all the field lateral canals which run north-south. A spill pipe with a header-gate allows gravity drainage most of the year. When water levels will not permit gravity drainage, a pumping installation is provided to take off 4 acre-inches in 24 hours.

Shallow swales cross the nine row blocks to provide surface drainage in the blocks, collecting water from the water furrows and taking it to the canals. These swales are connected to the canals by a 15 inch culvert. Each of the 14 blocks has at least one swale. These swales are located at the lowest elevation in the block.

Varieties. Varieties planted are 'Simmonds', 'Pollock', 'Tonnage', 'Peterson', 'Monroe', 'Ruehle', and 'Hall'. To facilitate pollination, the 'Simmonds' and 'Pollock' varieties are interset—2 rows 'Simmonds', 2 rows 'Pollock', etc. To the extent possible, the other varieties are planted alternately with respect to A and B flower types.

Cold Protection. A permanent heating system designed by Spot Heaters, Inc. is being installed presently. It will be operational before December 1, 1973. It utilizes 40 heaters per acre and burns diesel fuel.

Irrigation. Immediately prior to planting, a drip irrigation system was installed, utilizing microtubes. Each tree has two microtubes supplying water. When the trees were planted, one of the two microtubes was turned toward the tree so as to place its water immediately adjacent to the tree. This was done because of the limited root system of the small potted trees. They would have been unable to get water from the microtubes, which varied in length from 66 to 39 inches in order to compensate for pressure changes down the row. After about one year, anticipating that root growth will allow, this tube will be extended to its normal position. The entire drip system is under-ground to prevent rodent and mechanical damage. Only the ends of the microtubes are above ground.

After initial heavy use of the system, we settled on operation of the system 1% hours per day, tempered by rainfall. The system is operated either by a manual switch or a timer switch.

The iron content of our water has created some problems. Initially, on the advice of a consulting chemist, we pumped from a ditch. This was done in the hope that all iron in open water would be precipitated and filterable. However, it was found that some soluble iron was still present and precipitated in the lines, causing problems. We have gone back to well water containing 5 ppm iron.

We are injecting acid into the water to depress the pH and keep this iron in solution until it comes out of the microtubes. This method seems to work well. Constant vigilance is necessary when this type of water is used to prevent a buildup of iron precipitates. The response of the trees to this method of irrigation has been very pleasing. A sand filter and a 160 mesh screen filter are used to filter out particulate matter. A five horsepower motor turning a 3 inch centrifugal pump waters the entire tract.

The 94 acre tract has 6,015 trees set 18 ft. by 27 ft. This yields 68 net planted acres by tree count giving a 72% land use factor.