

Grove Caretaking

By JIM FISHER

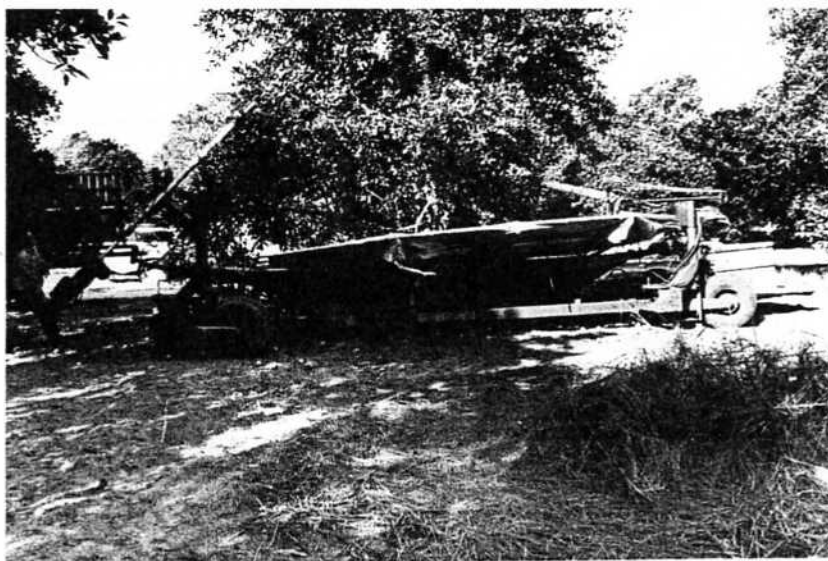
"I feel that all the progressive growers, at least, should be thinking about what they need to do to get ready for mechanical harvesting. Certainly I think they should believe in mechanical harvesting, because it's coming just about like tomorrow is coming. Maybe it's not coming next year but it's going to come pretty soon."

The name of the game in grove caretaking now appears to be mechanization, not only in keeping down the costs of producing a crop of fruit, but in getting prepared for machine harvesting, as indicated by the aforementioned remarks of James Blair, mechanical harvesting coordinator for the Florida Department of Citrus.

Speaking much in the same vein was Glenn Coppock, DOC agricultural engineer at the Agricultural Research and Education Center, Lake Alfred, one of the pioneer researchers in the Florida citrus industry in machine harvesting. "It's important—very important—to do some preparation of the grove for any kind of mechanical harvesting," he said. "I believe it is too much to expect, in most of the groves, to just go in and harvest without doing any preparation."

Coppock has been readying a grove owned by the center for mechanical harvesting tests. Working with him was Stan Best, a transplanted Washingtonian, who arrived in Florida last November after pulling a Roberts Harvester diagonally across the country.

"My main interest is to do custom harvesting," Best said, but recently he has been pruning trees for Coppock and for Don Bryan, director of the Lake Garfield Citrus Cooperative, who has expressed an active interest in the machine that Best brought with him. Using a chain saw, Best said, he had pruned 5,500 trees for Bryan and "right at 6,000 trees in the past two



Stan Best ran into problems last fall when he brought his shaker-catchframe mechanical harvester from Washington to have a try at Florida's citrus. Now modifications are to be made by the manufacturer in the harvester to conform with crop conditions here, and Best has been working in grove preparation for machine harvesting.

he never worked past noon, to avoid the sun's heat.

"We may use an air harvester in here some," Coppock said, referring to the center's grove that was being prepared, "but primarily we will use a limb shaker with a catching frame. However, we will test any other new harvesting devices that we have at the time . . . pickup machines, fruit rakes and this sort of thing."

Best explained he was lifting tree skirts to approximately 3½ feet on the average. "We're trying to eliminate the leaders to approximately five—four are preferable, but the trees haven't been pruned like this for several years, so we'll have to stick mainly to about five leaders."

He expressed hope that the proposed Roberts double shaker unit would be able to move at a rate of 25 trees or more per hour, making two or three grabs with each shaker per tree. He also noted, "By pruning the trees so a guy can get a decent grab on the limb, it will take a lot less abscission material to remove the fruit."

When asked if the pruning would make much difference in production, Coppock replied, "These trees are old and a lot of the lower limbs have quit producing

continued, would show "that a very small percentage of fruit is borne on those lower limbs."

Approximately seven acres of trees, set on a 25 by 25-foot spacing, will be involved in the experimental work, the ag engineer said. "I don't know the age of the trees, but they were hit real bad with the cold back in 1962. Most of the larger outside growth has occurred since then," he said.

Hedging would be done in one direction, he said, to open up adequate size drive middles for the harvesting equipment. "No topping is necessary in this grove," he added. "The trees, I would say, are from 15 to 18 feet high."

Harvesting of pineapple oranges in the grove would begin about the first of next year, he said, while there are several rows of Valencias that will be used for harvesting and for testing abscission chemicals.

Pointing to one of the pineapple orange trees, Coppock explained, "This tree is pruned specifically for tree shaker and catching frame. The skirts are raised so the frame can go under the tree very easily. The water sprouts are removed inside the tree so the shaker can grab onto the limbs with a minimum number of clamps."

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Best brought with him from Washington a machine that was designed for other commodities than citrus, such as cherries and prunes. Modifications are necessary, he said, such as lowering the catchframe, enlarging the conveying system to handle more volume, and replacing the shakers with models that will be more powerful, having slower frequencies and a longer stroke.

"With the cooperative efforts of the Florida citrus industry (which provided a loan for development of the two-shaker machine) and of Roberts Harvesters out of Portland," Best said, "I think we'll have a machine next November with the modifications. So my main concern now is to have the groves prepared in which to use it."

The grove he pruned for Bryan, he said, is being hedged on every other middle each year. High productive trees, he related, came right down to the ground. "He is real interested in mechanical harvesting," Best said of Bryan, "and he's decided to go ahead and do some skirt lifting and to remove suckers. He feels his production loss is minimal. If we can run the equipment at full efficiency, then his picking costs will be cut way down."

Best recommended that a grower have pruning done on a piecework basis, having one or two supervisors over a crew to see that the job is done. "Production will be up three times what it would be if he paid by the hour," Best said.

Regardless of what type of mechanical harvester might be used, Blair said, some grove preparation is necessary.

While an air harvester drops fruit on the ground and there is no need to skirt trees in this particular case, he said, "if you want to pick it up off the ground, you need to prune the skirts, also, because clearance under the tree is necessary for pickup equipment."

Coppock said the brush created by Best's pruning would be broken up with a chipper, "hopefully into

small enough pieces that they will deteriorate before next fall, so we can use pickup machines in here for harvesting."

Rows in the grove to be used in the harvesting tests are straight, he noted, with ample turn middles at the ends. A drawback, he said, is that the grove doesn't have an irrigation system.

"Speaking of irrigation," Blair said, "I think it's been found that, after trees are shaken in mechanical harvesting, it is desirable to get water to them."

According to R. E. (Bob) Norris, veteran citriculturist, in his booklet, "A Guide to the Economical Production of High Quality Citrus Fruit," hedging originally was instituted largely to improve the percentage of packout of crops earmarked for fresh fruit channels, along with opening groves to expedite the operation of grove maintenance for grove rejuvenation. Now, both operations are important in shaping trees to aid in harvesting operations.

Charles V. Kime Jr., production manager for Waverly Growers Cooperative, said hedging and topping have become of "paramount importance" among old groves in the Ridge area. "Citrus trees respond very much as your wife's shrubbery does to hedging and topping, or pruning. They put out new growth and new fruiting wood, and the fruit they produce is of a better grade.

"I think if we hadn't been hedging and topping, we probably would have been out of production up and down the Ridge, because the trees would have been old and unproductive. Some that I know of are between 80 and 90 years old, and they're still economically producing."

Waverly has been hedging trees for 23 or 24 years, said Kime, who has been with the cooperative a quarter century. "We kind of got our feet wet," he said, in being one of the first organizations to get into this practice. At first, it was done on a limited base in old groves, he said, with other citrusmen considering them a bit odd for cutting off fruit. "Then people got interested in it, and the Citrus Experiment Station did a lot of work

on it.

"All in all, it has proven to be very successful, very profitable."

He said hedging was started with "what we called whiz saws" and pruning shears. The electrically operated, high-speed saws were small and mounted at the ends of poles. Workmen could sweep trees from a truck, at times perhaps cutting out a tunnel between rows. "It's a big improvement to do it by machinery," Kime said.

In Waverly's program, a middle is hedged every other year as a uniform practice, depending on tree growth and if a middle has refilled sufficiently to warrant attention.

"We haven't gotten into mechanical harvesting yet," he said. "We're thinking about it."

He explained caution is being used in this area because Waverly is made up of small growers, and a crop might be the grower's sole means of income. "It makes it a little more difficult for us to do experimental work."

Waverly, itself, he said, owns only 30 acres of grove property, while there are 9,500 acres in the cooperative, scattered from southern Lake county to Arcadia. And Kime is responsible for all the production.

Norris, who came out of retirement to be interim director of Florida Citrus Mutual's grower division, said regarding those in positions similar to the one held by Kime, "among the most important and well informed people in Florida's great citrus industry are its grove production managers and caretakers. They are regarded by many as the industry's unsung heroes. Whether or not this is so, they are key people."

He went on to explain, "Production managers make most, if not all, of the decisions with regard to details of the management of the groves in their charge. This includes long-range planning and the day-to-day activities in the grove. Sometimes this is done in consultation with grove owners, but more often owners leave management decisions to their managers or caretakers."

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The veteran of 32 years with the Lake County Extension Service pegged the average production manager as about 40 years old, a college graduate, married and the father of two children.

Norris termed him as a "good family man," who is active in church and civic affairs, while his recreational activities center on the outdoors in such pursuits as fishing, hunting and golfing. He is a member of professional organizations that relate to his work, two of the most popular being the Florida State Horticultural Society and the Florida Citrus Production Managers Association.

Kime said he has been president of the latter group and has filled the post of secretary-treasurer for quite a number of years. The FCPMA has about 140 members, he said, and "we represent the lion's share of the industry." He's been associated with the organization nearly two decades.

"It's a very good organization," he commented. "We meet four times a year, primarily with the experiment station personnel. We get together more to upgrade our information and to trade conversation."

Norris said the association, organized in 1937, has been cooperative with the Institute of Food and Agricultural Sciences (IFAS) at the University of Florida, and its Cooperative Extension Service and experiment station at Lake Alfred. It also supports U. S. Department of Agriculture researchers.

"Its members helped develop and are strong backers of the Budwood Registration Program, the Rootstock Validation Program and the Burrowing Nematode Program of the Division of Plant Industry of the State Department of Agriculture," Norris noted, adding, "It has been effective in labor relations activities."

Kime said production managers are seriously concerned with rough lemon root decline or young tree decline, nematodes of various



Skirts have been lifted in a grove of the Agricultural Research and Education Center, Lake Alfred, in making preparations for experiments in mechanical harvesting and the use of abscission chemicals. Trash still was under trees at right after lower limbs had been removed with a chain saw.

types, snow scale control, new spray materials and with research work in dwarfing of trees—"things of that type that help keep production expenses tenable, or so you can live with them."

Regarding the matter of climbing expenses in this area, Ronald P. Muraro, farm management specialist with the Polk County Extension Service at Bartow, remarked, "The inflationary costs we have experienced in the citrus industry have not spared the citrus caretaker. With increasing costs for labor, fuel, parts and equipment, the citrus caretaker has had to increase the customer rates charged for his services."

Tables Muraro prepared showed that, on the average, most custom rates had increased 20 per cent from March of 1972 to February of this year. His tables showed increases ranging from 6.24 per cent (cost of herbiciding by the hour—plus materials) to 58 per cent (cost of power saw with operator per hour).

Among the leaders were dry bulk fertilizing, from \$8.42 to \$12.38 per hour plus materials, and machine banking and unbanking, which went from \$7.15 to \$10 an hour plus transportation. Planting trees went from \$2.25 to \$3.06 an hour plus the cost of a water truck.

Information presented in the

tables were obtained from surveys of Polk County citrus caretakers in March, 1972, and February, 1974, Muraro said. Copies may be obtained by writing the Polk County Extension Service, P. O. Box 50, Bartow, Fla. 33830.

"With increasing customer rate charges also will come increasing citrus production costs," Muraro said. "Therefore, more than ever before, the citrus caretaker and producer will have to work more cooperatively together. For they both are dependent upon each other to maintain a productive and profitable business."

In dealing with some of the rising costs, Kime said, Waverly has gone into a liquid-dry fertilizer program, "in which we put out materials rather than mixing fertilizer goods. In turn, that provides a chance to put out very high analysis materials, rather than low analysis, which reduces freight rates and gives a better operation, too, because less equipment and people are needed to fertilize a grove."

Separate distributors are used, he said, for putting out liquid fertilizer, usually a nitrogenous material such as liquid ammonium nitrate or a combination of urea and ammonium nitrate, and for spreading dry fertilizer, either a

sulfate of potash magnesia or a muriate of potash. In some operations, he said, a distributor is used that puts out liquid and dry material at the same time.

Taking this route for fertilizing, he said, "has been a way of keeping operational cost to a minimum, because you're getting more plant food per pound of material used, and you can move faster."

Waverly has cut back from three to two applications a year, Kime said, and has found two to be just as effective. It has been found experimentally that one application is effective, he said, but "we haven't got that far yet." Applications are made in late fall and in early to late spring, depending upon weather conditions.

"Our effort has been toward mechanized fertilizer operations," he noted, "rather than putting out low analysis materials."

The same concept is being extended to irrigation, he said, with concentration being made on an overhead system "simply because

there's not enough known about the drip system yet."

Getting back to the topic of pruning, Kime remarked, "Part of the justification for topping is for ease of harvesting. Trees have to be low because they don't manufacture a ladder over 21 feet long now. If trees are much over 21 feet, then the tops are never picked, or seldom picked. We're trying to keep trees down to somewhere between 20 and 25 feet."

Hedging facilitates production operations, he continued, because it is easier for trucks and tractors to get through the groves. He pointed out, too, that it is easier to spray a small tree, even though Waverly does its spraying from the air.

Waverly tried fixed-wing aircraft for spraying, Kime related, but found them less adapted than helicopters for the small blocks of the cooperative. "We need something that can go at a lower speed and get into the corners," he

explained, "and going at a slow speed gives more time to cut the spraying on and off."

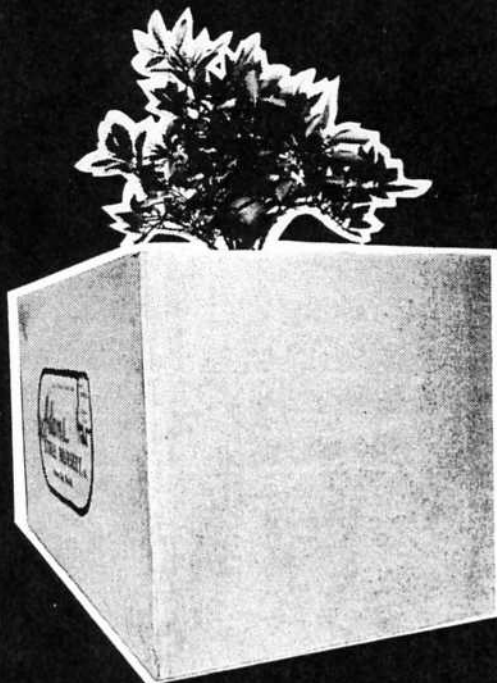
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