Mechanical harvesters: Promise and problems

By Ernie Neff

A crowd of about 60 listened to a metallic "click-clack-click-clack-click-clack" sound growing in volume on the far side of a ditch. The sound was similar to that of a German tank approaching in an old World War II movie. But this was a citrus grove near Immokalee, not a battlefield. The machines creating the clacking sound were Oxbo continuous canopy shake harvesters that move through rows of trees without stopping.

The two giant yellow harvesters that comprise a working "set" of Oxbos finally emerged from the grove across the ditch. The crowd could clearly see huge numbers of oranges being shaken loose by multiple "probes" that shook the trees as the machines passed by.

"It's a brief but very dramatic view" of how much fruit the Oxbos can harvest, said Fritz Roka, a University of Florida agricultural economist. Indeed, Tom Visser of T&S Harvesting, which owns the harvesters, said a set of two Oxbos can load from five to 25 trailers a day. But, he quickly added, 25 loads has been accomplished only occasionally, on very unusual days when there are no mechanical breakdowns and plenty of fruit trailers are available.

Visser said a set of two Oxbo harvesters operating in a clean, uniform grove will get 90 percent of the fruit in the trailer. Another seven to eight percent of the crop will be picked by hand laborers "gleaning" fruit after the machines go through, he said.

"The industry cannot accommodate them (the Oxbos)," Visser told the crowd. He explained there either are not enough trailers to take all the fruit the Oxbos can harvest in a day, or not enough groves for them to operate in. "There's not much of a movement in the industry" to adopt mechanical harvesting, he said.

Visser and his audience were participants in an April 6 University of Florida Citrus Mechanical Harvesting Field Day near Immokalee. After the Oxbo demonstration was complete, a bus hauled growers, researchers and others in the crowd to a grove being harvested by Coe-Collier Citrus Harvesting trunk shakers.

Coe-Collier manager Will Elliott said his company's machines, which stop to shake one tree at a time, harvest 91-92 percent of a grove's fruit with one pass. Remaining fruit is gleaned by hand.

"We're trying to keep you in business," Elliott told growers. "We need you to keep us in business."

Roka said trunk and canopy shakers like those shown on the tour handle more than 90 percent of groves that are currently harvested mechanically. Approximately 25,000 acres were mechanically harvested in the 2004-05 season.

Will Elliott of Coe-Collier Citrus Harvesting discusses his company's trunk shakers, shown in action below. "We're trying to keep you in business," Elliott told growers. "We need you to keep us in business."

An Oxbo continuous canopy shake harvester.

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In the Southwest Florida Research and Education Center before the harvesting tour began, Roka said oranges are hand harvested in Brazil for less than 50 cents a box. By contrast, hand harvesting costs $1.50 to $1.70 per box in Florida, he added.

Roka later said mechanical harvesting contractors have been charging $1.25 to $1.35 per box this season. That price includes the cost of gleaning. "Growers in southwest Florida who have committed to mechanical harvesting are saving significant amounts of money," he declared. He believes mechanical harvesting costs eventually could drop to less than 75 cents per box, but several problems have to be overcome.

Roka said one of the problems Visser addressed – insufficient trailer allocations – is the second biggest impediment to mechanical harvesting adoption.

The biggest impediment, he added, is the "late season" problem. In spring, there are two sets of Valencia oranges on the tree – the current season's mature oranges and immature fruit that won't be ready for harvest until a year later. Currently, mechanical harvesting conducted past some point in May shakes off much of the next season's immature fruit, along with mature fruit.

Researchers think the late season problem can be solved with the use of an abscission chemical. An abscission chemical loosens mature fruit enough that it can be shaken off with less force so that the next year's crop is largely spared.

University of Florida researcher Jackie Burns said the industry is working to register a promising abscission agent called CMNP. However, the product isn't likely to be registered for full use until 2010, she said.

While mechanical harvesting can reduce the following season's Valencia yield, it has no impact on the next-season's Hamlin yield, according to university plant physiologist Jim Syvertsen.

Bob Rouse, a university horticulturist, spoke near the end of the program about future tree requirements for mechanical harvesting. He said citrus canker regulations affecting citrus nurseries will raise the price of trees to at least $7 each. There are also additional costs to prepare groves for mechanical harvesting. Near the end of his talk, Rouse showed slides stating: "The survivors in the industry will be mechanically harvesting their citrus ... Pay a little more now, or a lot more later."

Funding the Florida Citrus Archives

Florida Southern College President Anne Kerr and State Senator J.D. Alexander visit on the campus in March. Alexander was instrumental in getting the state of Florida to contribute $100,000 for the college's Florida Citrus Archives. Additional public and state funding is needed. Information is available from Robert Tate, vice president of development at FSC, at 863-680-4347.