Researchers Closer to Abscission Solution

By Jina Martin

Mechanical harvesting shakes most of that fruit right off of the tree. But, for the remaining fruit, abscission agents could be their savior.

Mechanical harvesting alone can retrieve about 90 percent of the citrus crop, said Fritz Roka, associate professor at the University of Florida/Institute of Food and Agricultural Sciences (UF/IFAS) Southwest Florida Research and Education Center. Adding abscission agents to the mix could push retrieval rates above 95 percent.

Another added benefit: Abscission agents will make mechanical harvesting more efficient, and more efficient mechanical harvesting saves growers money.

Currently, hand harvesting and roadside costs run between $1.60-$1.80/box, Roka said. Mechanical harvesting costs run between $1.25-$1.35/box, using remove and catch systems, Roka said. This cost also includes taking the fruit to a trailer and a gleaning crew to come in behind the machine to remove any remaining fruit.

But, Roka said abscission agents have the potential to lower the cost of mechanical harvesting. Abscission agents could eliminate the need for a gleaning crew, and more importantly, they could extend mechanical harvesting through the Valencia season. Currently, mechanical harvesting systems have to stop harvesting the Valencia crop by mid-May because of concerns over removing the new fruit developing on the tree. But, a selective abscission agent would loosen mature fruit and not the young, developing crop.

PHOTO BY SCOTT EMERSON

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In the future, Roka said he sees it as a possibility that mechanical harvesting costs could be decreased to as low as $0.50/box. That decreased cost would be the result of actions that improve efficiency, such as properly prepared groves (skirted, hedged and topped), more efficient mechanical harvesting machines and the use of abscission agents.

One Agent Rises to the Top

Abscission agents are not currently available. A team of researchers at the UF/IFAS Citrus Research and Education Center (CREC) hope that won't be the case for long.

"The abscission research group at the CREC remains committed to searching for and adapting abscission agents for use on Florida citrus," said Jackie Burns, professor at the CREC who heads the abscission research effort. "We are focused on defining eco-

nomic benefits and risks of abscission agents used in combination with mechanical harvesting technologies."

To date, the abscission researchers have tested more than 350 compounds. Several have risen to the top, including CMNP, ethephon and coronatine.

"There is no doubt that CMNP offers superior efficacy and grower control," Burns said. "It causes fruit loosening over a wide range of concentrations, is non-phytotoxic at these concentration ranges, does not negatively affect tree health and yield and loosens fruit three days after application."

Ethephon and coronatine are promising, but defoliation is problematic, especially with ethephon, Burns said. The researchers are working with additives and the companies who manufacture them to reduce defoliation with these abscission agents.

"For now, CMNP is the abscission agent we are the most excited about," Burns said.

Griffin LLC is also excited about CMNP. They are currently in negotiations with the Florida Department of Citrus to produce and sell CMNP. A final agreement has not been reached yet, but "both parties are enthusiastic about the potential that CMNP brings to the Florida citrus industry," Burns said.

It is probable, Burns said, that this partnership will take the necessary steps to guide CMNP through the registration process. The steps include: synthesis and reformulation of CMNP, field testing and studies on toxicology and fate of CMNP in plants, animals and the environment.

"All of these steps involve research and may lead to more or less testing, depending on the results," Burns said. "I think five to seven years is a reasonable estimate of the time necessary to get CMNP through the registration process and into the hands of the Florida citrus grower."

Why the Hesitation?

According to the Florida Department of Citrus, approximately 16,900 acres were harvested mechanically during the 2002-03 season. That's only about 3 percent of Florida's processed orange crop. If mechanical harvesting saves money, why are so few growers using it?

Roka said it deals with a number of issues, such as the fear that mechanical harvesting damages trees.

"There is no evidence to suggest that mechanical harvesting, by itself, adversely affects next year's yield," Roka said.

Another big hurdle is the initial cost of mechanical harvesting. Groves need to be set up for mechanical harvesting, and those costs can run $100-150/acre.

"That's a big commitment of money when prices have been the way they are," Roka said.

Despite the initial investment of money, Roka said that mechanical harvesting is "very imperative" for Florida growers to remain competitive. And, he said that whatever growers have to do to lower costs, they must do.

Roka said the cost of labor is going to continue to rise, and the cost of mechanical harvesting has the potential to decrease as more efficient methods are implemented, including the use of abscission agents. ***CVM***

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