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# MECHANICAL HARVESTING RESEARCH CRANKS UP AGAIN

By Gordon Smith

**A**fter several years of little concern about mechanical harvesting of citrus, there is now renewed interest. This was covered during a seminar held in connection with the recent Citrus Expo in Fort Myers, Fla.

After a brief history of mechanical harvesting research presented by Jodie Whitney, Tom Schieffelin talked about harvesting safety and workers' compensation. Whitney is an agricultural engineer at the Citrus Research and Education Center, while Schieffelin is director of safety management for PCA Solutions, Inc., Altamonte Springs, Fla.

PCA Solutions is involved with the Citrus Self Insuror's Fund and Schieffelin related that 29 percent of harvesting accidents involve slips, trips and falls and 56 percent of claims are paid out for these types of accidents. Twelve percent of claims come from over-exertion.

Back injuries may be the result of over-exertion, said John Miles of the University of California-Davis. He discussed ladders, bags, clippers and other equipment necessary for the harvesting of citrus.

With the cost of labor going up, Miles said growers must find ways to improve the productivity and working environment of harvesting crews. He said pickers seem to want big picking bags so they don't have to empty them so often. A picker can, however, be just as productive with a 40-pound bag as with an 80-pound bag, Miles said.

Ladders might be redesigned, Miles said. One possibility would be to change the center of gravity of ladders so they could be moved more readily.

The use of mobile loading machines in young groves might also improve productivity, said Scott Hedden. He retired from the USDA after many years of mechanical harvesting research. Such machines can have a bin with a capacity of 90-100 bags of fruit. Used in groves with trees 6- to 10-foot

tall, all pickers dump into a common hopper and pool the output.

Hedden said that with such a system, pickers spend 90-94 percent of their time actually picking. This is a higher percentage than with other harvesting systems.

Matti Laserson, president of Fruit Harvesters International, Inc. in Alva, Fla., talked about mechanical harvesting of fruit for processing. He said there is a potential for 750 mechanical harvesters to be operating in Florida. He said two machines with 12 people can harvest as much as a 35- to 40-man picking crew. Laserson added that the hand removal of 50 percent of the fruit from a tree is as expensive as removing 100 percent mechanically. He cautioned, however, that trees must be shaken gently and must be left in good condition.

Jodie Whitney made a second appearance at the Expo when he discussed grove design. He said the largest trees and best looking foliage do not necessarily also produce the best yield and quality of fruit. He suggested getting trees down to a manageable size — perhaps 16 feet in height. He also suggested in-row planting of 10-15 feet with 7- to 8-foot middles.

Skirting of trees is essential for mechanical harvesting, said Whitney.

Galen Brown is now overseeing the Department of Citrus mechanical harvester research effort. He said not every idea for a mechanical harvesting system will be funded. Although there has been a trend toward tree shakers, Brown said other systems will also be explored.

"If we do nothing, we're going to be in trouble," Brown said, stressing the idea that sooner or later, it will be necessary to mechanically harvest citrus because of cost factors.

In addition to searching for mechanical harvesting machines, Brown's functions will also include studying the shape of picking bags, use of and possible redesign of ladders, and pick and drop techniques. ○