

Harvester designs mechanical picking arm

Text and photos by Jane T. Adams

Mike Daniels' experience as a Southwest Florida citrus harvester has given him much insight into the problems of harvesting. This man, however, isn't content to sit back and complain about problems! After thoroughly analyzing last year's labor situation, he has produced a solution for hardship picking conditions — a citrus mechanical arm mainly targeted at large seedling-type trees in scattered blocks.

Initially, this invention was a tapered contraption, shaped much like the rear tail section of an airplane. It worked similar to a Norelco shaver, pulling up oranges, then cutting them off and dropping the fruit.

Daniels invited two DeSoto County manufacturers from C. Stephens Industries (CSI), Donnie and Chris Stephens, to review with him the citrus arm's operation. At that point they agreed to keep the principle involved but to change the shape, size and way the head was executed on the goat. The initial flat, diamond-shape had PVC rollers and utilized a rotary motor, but movement of the fruit using the flat surface was too time-consuming and awkward. Void areas resulted in utilization of only 60-70 percent of the surface area.

To improve this, a dome-shaped basket increased the picking area to 100 percent. After fruit is picked, it drops into the bottom of the newly-shaped device which holds over a box of fruit. The basket opens 60 degrees

for speedy dumping into a truck. The top section, made of half-inch cold roll steel (round rod), provides rigid construction. The main frame, two by four square tubing, gives additional strength. Surrounding the basket is a solid 100 percent gum rubber pad which protects trees from any impact they may receive from the mechanical picker. A recent improvement is the addition of spring loaded wipers which allow fruit to drop without becoming lodged in the basket. Daniels notes, "When picking Valencias, the recessed wipers have the added feature of preventing the machine from picking young Valencias or pulling the bloom from the trees."

Daniels and the Stephens decided to name their streamlined orange and black product, the Mongoose A-300 after a small animal known for its swift action.

Daniels says, "The version we have right now for scattered blocks is designed as a one man operation. We believe nine to 10 oranges can be picked per second, which will equate to about a trailer load of fruit a day in a grove with scattered trees.

"We can begin immediate production of the heads and attach them to goats. Once they are ordered, a three-day delivery process is required."

Operators for the production type machine, currently in the manufacturing stage, are dependent upon the number of booms in use. Daniels say, "We are anticipating producing a double boom type machine. As the operator drives down the row he will be picking one side and the second person will pick the other side. In addition to those individuals, drivers will be needed to shuttle the fruit by truck."

Through past observations, Daniels concluded



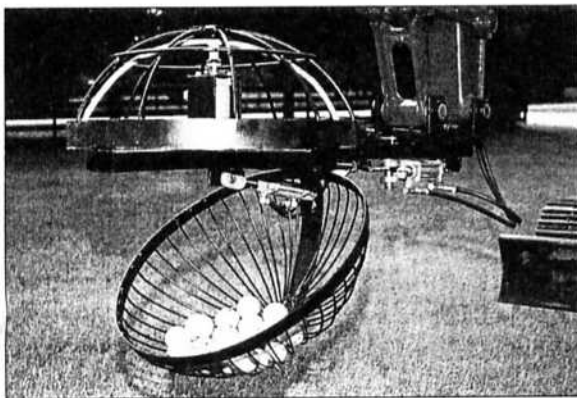
The latest version of the Mongoose A-300 was shown at the Lakeland trade show in October.

there was a problem with picking machines holding the fruit. When the machines became full, their cargo had to be dumped. This resulted in a time lag during the transporting process. He notes, "We already have the goats and plan to use them as courier trucks from the picking machines back to the trailers."

At the Citrus Expo in August and at the Lakeland Trade Show in October, growers saw how the citrus picking head could operate on a Link Belt Machine. Daniels stated, "Right now we are investigating other alternatives such as an experimental forklift machine. This four wheel drive machine is compact. Its overall height is 74 inches with a wheel base which has a turning radius of 94 inches. It is highly maneuverable."

The trio involved in the development of these mechanical pickers has received numerous inquiries. Recently growers analyzed the Mongoose A-300 in Hardee County at the Carlton's Two by Four Ranch. Bert Roper of Roper Growers Cooperative in Winter Garden has purchased a picking head for field testing analysis this year. In addition, several other on-site field testing operations are underway.

At present, the Mongoose A-300 is designed for juice fruit, but it will be tested for fresh fruit this season. Daniels' believes this invention will dramatically cut overhead related to labor expense. Further information on the Mongoose products may be obtained by contacting the manufacturers at 800-226-0693. ■



The basket hinges to 60 degrees