

AN INVESTIGATION OF THE MOBILE PICKER'S PLATFORM APPROACH TO PARTIAL MECHANIZATION OF CITRUS FRUIT PICKING¹

G. E. COPPOCK AND P. J. JUTRAS²

Florida Citrus Experiment Station

Lake Alfred

Picking citrus fruit by hand is an expensive operation and one which entails a large portion of the cost of production and harvesting (3) (5). It is becoming increasingly difficult to find suitable labor to perform this strenuous task (1). At present citrus picking is limited to people of sturdy physique, regardless of intelligence or dexterity. The job is shunned by anyone who can find almost any other job at the same money. Adequate mechanization would make the job less strenuous, thus opening up a new source of labor not now available.

Previous studies (4) (2) indicated that the pickers' productivity could be increased and the work made easier by using a mobile picker's platform which would position the picker in the tree under conditions similar to those found when picking from the ground. A study of the design requirements and expected performance of such a machine are presented in this paper.

PROPOSED PICKER'S PLATFORM

An analysis of the design requirements of a proposed picker's platform for use under current grove conditions revealed that it would have to transport two pickers to and from the grove, position them individually in the tree with a minimum of lost time, collect and store the picked fruit in bulk containers and discharge these containers when full.

The mechanics of the machine requires that its use be limited to positioning the picker so he can pick the fruit above a point six feet up on the tree. The fruit below the six-foot level would be picked by a picker standing on the ground (Figure 1). Efforts to enable the picker on the platform to pick all the

fruit complicated the design of the machine beyond the practical point.

It was felt that the proposed machine should consist of a transport unit, two pickers' baskets³ with independent positioning mechanisms and a fruit removal system. The transport unit should be built low to the ground with adequate under carriage to assure good floatation in sandy soils. Power should be ample for rapid mobility in these soils. Controls should be within reach of the pickers from their baskets.

The picker's basket should be constructed to provide adequate room for a man to move around freely and to provide a smooth exterior shape. Mechanical means should be provided to move the baskets horizontally, vertically or rotate them through 270 degrees. The horizontal and vertical movements should be accomplished with a retracting type mechanism such as a telescoping tube or pantograph linkage. This would enable operation in close groves. Controls should be either of the throttling or modulating type for smooth starts and stops.

A batch type fruit removal system should be used to assure positive removal. The fruit would be collected in a bin on the picker's basket and emptied onto a conveyor as the basket passes over it in the normal picking operation. The conveyor would in turn empty the fruit into bulk containers which, when full, would be automatically discharged from the machine.

In operation, the proposed machine would require a crew of two — one picker for each of the two picker's baskets. The fruit below the six-foot level would be picked by a separate crew picking from the ground. This crew would not necessarily be co-ordinated with the platform's operation. The procedure of operation is shown in the lower part of Figure 2. The machine would be spotted between four trees. The picker located on the front of the machine would pick one-quarter of each tree on each side while the picker on the rear would pick the equivalent of the trees

¹Florida Agricultural Experiment Station Journal Series, No. 1155.

²Cooperative research by the Florida Citrus Commission and the Florida Citrus Experiment Station.

³The authors — G. E. Coppock and P. J. Jutras — are, respectively, Associate Agricultural Engineer, Florida Citrus Commission and Assistant Agricultural Engineer, Citrus Experiment Station, University of Florida.

³"Pickers' basket" refers to the individual platforms located on the transport unit.

