

Research Note

EVALUATION OF A HAND-OPERATED COFFEE PICKER¹

At present, coffee berries are picked by hand because there is no efficient mechanical harvesting equipment available. The coffee plant is an evergreen shrub which grows to a height of about 4 m. The secondary and tertiary branches are relatively thin. Branches above the height of coffee pickers have to be pulled down for harvesting. Pruning can help to keep branches within the reach of the laborer.²

The portable coffee picking machine here evaluated consists of two helicoidal spindles connected by gears (fig. 1) that rotate the spindles in opposite directions. The spindles are placed on opposite sides of the fruiting branch (fig. 2) and are pulled or

pushed along the branch. Contact with the branch and berries causes the spindles to rotate. To facilitate the use of the machine, the handle of the unit extends transversely in the direction of the spindles. A basket surrounds the spindles in such a manner that harvested berries fall into it. The operator then empties the basket into a large container such as that used in conventional coffee picking. The testing and evaluation of this machine was done at the request of its inventor, Victor M. Alexandrino, who asked permission of the Dean of the College of Agricultural Sciences and the Department of Agricultural Engineering, UPR-RUM.

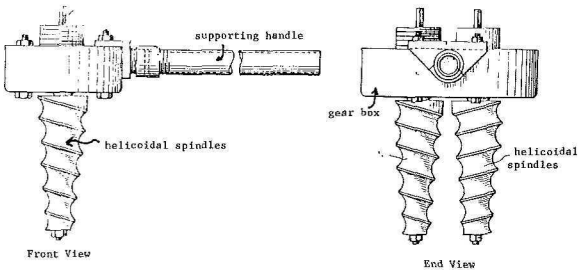


FIG. 1.—Hand-operated coffee picker.

¹The manually operated coffee picker was designed and developed by Victor M. Alexandrino, US Patent No. 329865, Dec. 11, 1981, pending. This machine was tested and evaluated under project TAD-PR-4, "Appropriate machines for hill land farming". The authors thank Anibal Torres, Carlos Torres and Alfredo Santiago for their help at different stages of the evaluation.

²Alexandrino, V. M., 1983. Portable coffee harvesting machine. Paper No. PR-83-04 presented at the 1983 Spring Meeting of The Puerto Rico Section of The American Society of Agricultural Engineers, Mayagüez, P. R.

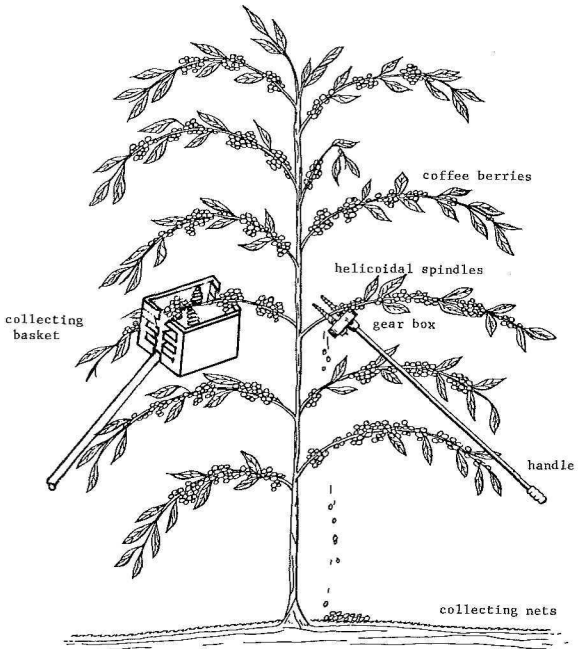


FIG. 2.—The coffee berries being picked by the hand-operated coffee picker, with and without collecting basket.

In January 1984, the above machine was evaluated at one of the commercial coffee farms located in Adjuntas. Coffee trees (var. Robusta) were spaced 3 m x 3 m; the orchard was about 5 years old. The seasonal data collected by the farmer indicated that 19.0 kg/hour of berries are picked by an average farm worker working 8 hours per day.

Berries from the randomly selected trees were picked by the machine, and were picked by hand in the control treatment for

15 minutes. The picked berries were classified into mature berries, green berries and trash. The berries which fell on the ground were also picked and classified into mature and green berries. The mean values are given in figure 3.

Material collected by the machine was 39.8% ripe berries, 29.2% green berries, and 1.0% trash; 31% of the berries fell to the ground. When picked by hand, 61.6% of the material in the collection basket was

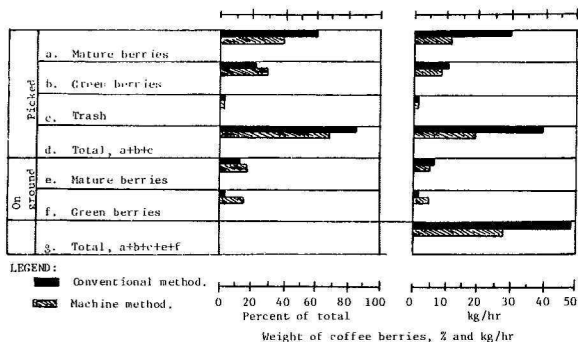


FIG. 3.—Evaluation of hand-operated coffee picker.

ripe berries, 22.1% was green berries and 1.1% was trash; 15.2% of the berries fell to the ground. The machine picked 19.2 kg/hr; hand laborers picked 39.9 kg/hr.

This study indicated that the hand-operated mechanical picker damaged flowers and flower buds, picked green berries and

dropped a high percentage of berries to the ground.

Megh R. Goyal
 Associate Agricultural Engineer
Félix R. Rivera
 Assistant Agricultural Engineer
 Department of Agricultural
 Engineering

