

## REPORT ON THE EXPERIENCE OF USING MAN POSITIONING MACHINES IN HARVESTING AVOCADOS

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This report deals with the use of man-positioning machines to assist in the picking of avocados on a ranch in Corona, California. Five machines have been in use for various periods of time. One is a four-wheel machine with a full rotating boom; the other four are three-wheel machines on which the booms are fixed rotationally. On all machines the booms elevate and lower hydraulically and are maneuvered by the operator from the basket at the end of the boom. The operators feel that the three-wheeled machines are more maneuverable than the larger four-wheel machine. Each of the machines has the capability of elevating the operator to a level where his feet are 16 feet above the ground. Several of the machines are equipped with hydraulic lines to the operator, so that hydraulic chain saws can be used to prune the tops of tall avocado trees. This use of the machines provides an additional economic factor which contributes favorably toward owning the machines.

The machines have been used to assist in the harvesting of 30 acres of Bacon, 20 acres of Hass and 50 acres of Zutano avocados. Most of the trees are planted on a square pattern of 18 feet by 18 feet making 140 trees per acre. The terrain is fairly smooth with slopes varying from 5% to about 7%. The orchards are irrigated by drip irrigation, mostly buried, and non-tillage is practiced.

Crops harvested have varied in size from fair crops of 13,000 pounds per acre (93 pounds per tree) to light crops of 6,500 pounds per acre (46 pounds per tree).

A combination hour-and-bin rate has been used in compensating the picker. In light crop years this has been \$1.50 per hour plus \$7.00 per 680 pound (17 Calavo field box) Calavo bin whereas in heavier crop years the rate has been \$1.50 an hour plus \$6.00 a bin. The combination rate has proven to be most satisfactory to the grower as well as to the picker because the more he picks the more he makes per day, and at the same time the per-pound cost of picking that fruit becomes less to the grower. This can be seen in the chart where a picker is being paid \$1.50 an hour plus \$7.00 a bin, so that if he picks two bins per day he will earn \$27.50; including the machine cost the grower's cost per pound will be 4.3 c. Whereas, if that picker's productivity can be increased to five bins picked, he can earn \$48.50 per day with a cost to the grower of only 2.5c per pound. Experience has shown that a man's productivity can be increased by a factor of about 2.5 if he is put on a machine. This means then that the two-bin picker without the machine will pick fruit at a cost of 2.5 e per pound while the picker with the machine will pick five bins with the same 2.5c per pound cost to the grower. The obvious question then is, why use the machines, if there is no savings in the cost of fruit picked?

Even with the necessity of making a considerable capital investment, there are many

reasons why using the machines has proven to be an advantage to this company:

1. Since a man's productivity is at least doubled, less men are needed to harvest the crop.
2. Employees are economically better off, because they are able to earn 50% to 75% more money.
3. Pickers are able to work longer hours with less fatigue.
4. Less injuries have resulted and, more importantly, the injuries have been less severe; therefore less time is lost and a savings in compensation insurance premiums is effected.
5. Handling of field containers is simplified due to there being less picking units to service.
6. Since fewer men are required to harvest the crop, transportation and housing are less expensive.
7. It is possible to pick high fruit selectively and with greater accuracy.
8. Machines can be used for pruning high trees and also for tying trees during heavy crop years to prevent limb breakage.

Part of the machine operators are year-around employees and some are hired just for the picking season. There has been no problem in training previously inexperienced men to operate the machines. There is a feeling of competition and a desire on the part of the employees to be assigned to work on the machines.

The tables show the daily earnings, cost to grower per pound of fruit picked conventionally compared with cost when machine is used. The 25% added for overhead; provides for FICA, paid vacations and holidays, health insurance, housing, retirement, compensations insurance, and transportation. The cost of using the machines was figured at \$24.00 per day, depreciated over a five year period, including use factor of 100 days per year and cost of interest on the investment, gas, oil and maintenance. Both tables are based on a nine hour work day.

Table 1 uses \$1.50 per hour plus \$6.00 per 680-pound bin which is the rate paid when picking a 13,000 pound per acre crop. Table 2 is based on \$1.50 per hour and \$7.00 per 680-pound bin—that is the rate used when picking the lighter crop of about 6,500 pounds per acre.

TABLE 1. Using \$1.50 per hour plus \$6.00 per bin, working 9 hours

Bins Picked Per 9 Hour Day	1	2	3	4	5	6	7
Dollars Earned Per Day	19.50	25.50	31.50	37.50	43.50	49.50	55.50
Grower Cost Cents Per Pound	3.6	2.3	1.9	1.7	1.6	1.5	1.5
Machine Picked Cost Per Pound	7.2	4.1	3.1	2.6	2.3	2.1	2.0

TABLE 2. Using \$1.50 per hour plus \$7.00 per bin, work 9 hours

Bins Picked Per 9 Hour Day	1	2	3	4	5	6	7
Dollars Earned Per Day	20.50	27.50	34.50	41.50	48.50	55.50	62.50
Growers Cost Cents Per Pound	3.8	2.5	2.1	1.9	1.8	1.7	1.6
Machine Picked Cost Per Pound	7.3	4.3	3.3	2.8	2.5	2.3	2.1

*Note: The four-wheel machine is a Selma Treemaster and the three-wheel machines are Afron Power Ladders.*