

Suction Harvester

picks up almonds from ground at rate of about four acres a day

R. R. Parks and J. P. Fairbank

THE NEWEST MECHANICAL HELP for the almond grower in California is a suction-harvester which picks up the nuts from the ground.

The orchard is carefully smoothed and rolled before the nuts start falling. Then harvest is delayed until the nuts will knock easily. In this way, the machine-harvested nuts hull easier and require no additional drying before they are marketed or shelled. A machine will cover approximately four acres a day.

The forerunner of the almond suction-harvester is a filbert harvester developed at the Oregon State College. The nozzles were built from a blueprint of the filbert harvester nozzle. From there every one of the 15 machines in California differ in minor details but in general points are similar.

Construction

The fans are driven by industrial or converted automobile engines that will develop some 50 horsepower. It is necessary that about 2½" of vacuum is maintained at the nozzle tips that run along

about 1½" above the ground. To do this on a six nozzle machine, the fan must handle about 7200 cubic feet of air per minute, drawing about 5" of vacuum at the inlet.

Separation of the nuts from the air is accomplished by use of a large chamber just ahead of the fan where the nuts fall or are diverted from the air stream by a metal grill. Below this usually a rotary valve or "air-lock" is used to remove the nuts from this chamber and drop them into a cross-conveyor from which an elevator takes them to the sacks or trailer, whichever is used. Bulk handling in a trailer is an improvement two growers made on this year's machines to eliminate the need of the man on the sacking platform.

It does not require much power to move the machines over the ground because they move so slowly, less than one mile an hour. For this purpose, one builder this year used a six horsepower air-cooled engine. Some of the other builders have taken power from the fan engine to move the machine. Some others have gone to the expense of supplying

additional industrial engines for power.

All of the problems in machine harvesting have not been solved. The dust nuisance has caused considerable comment. Two growers this year found it practical to flood their orchards ahead of harvesting to get rid of the dust from the smoothing and rolling. It is believed that noncultivation can be worked into the management practice where machine harvesting is to be done. Also, some nozzle design changes can be used to reduce the dust somewhat, but the problem remains the most serious one to solve.

Advantages

The machines are not yet commercially manufactured. If their cost is estimated at \$3500 and the investment is written off in five years—then to harvest 100 acres of almonds annually, it will cost in the neighborhood of \$15 an acre counting labor, operating expense, repairs, interest, etc.

The grower who uses a machine for harvesting need not worry about drying winds hitting the orchard before he is ready to pick nuts. He has no seasonal labor problems. It is easy to train a machine operator. The nuts knock later in the season with about one third the labor. The machine-harvested nuts require no drying; and it is believed the meats shell out with less breakage and splitting.

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Two men operate this suction-harvester. The driver on the front watches for obstructions and regulates the height of the nozzles. The man on the rear platform sacks the almonds from the elevator, then sets the sacks off at the end of the tree row.

