THE WEISS-MCNAIR CONE HARVESTER

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Abstract. -- The Weiss-McNair cone harvester is a gasoline powered machine that scoops up slash (Pinus elliottii Englem. var. elliottii) and loblolly (P. taeda L.) pine cones from the orchard floor using two paddle wheels. The cones are then moved via two conveyor belts to a 20 bushel crate on a trailer at the rear of the machine. An air blower removes pinestraw and small sticks that were picked up with the pine cones.

INTRODUCTION

The harvest of pine cones is the most expensive aspect of seed orchard management. Maximum benefit from orchard management practices can only be achieved if the cone harvest is conducted in a timely and efficient manner. Because of the high cost of harvesting pine cones and the increasing potential for large cone crops due to enhanced management practices and increasing orchard tree size, the Company has examined and tested several cone harvesting systems. This paper describes one system which appears to have potential for increasing harvest efficiency.

PINE CONE HARVESTING PROCEDURE

Slash pine cones are dislodged with a tree shaker. Loblolly pine cones are hand picked by two-man crews in aerial lift trucks. Regardless of the collection method, the pine cones are removed from each tree and dropped to the ground. Moving the pine cones from the orchard floor to the seed extraction facility has been the most time consuming, and tedious aspect of cone harvest.

Prior to 1984, pine cones were removed from the orchard floor by hand and deposited into 20 bushel capacity cone crates by temporary labor crews. The temporary work force varied with the size of the cone crop, but was consistently increasing year by year. In order to reduce the cost and shorten the cone harvest season, a mechanical method of retrieving pine cones from the orchard floor and transferring to 20 bushel crates was developed.

THE WEISS-MCNAIR CONE HARVESTER

The Weiss-McNair cone harvester was developed from a pecan harvester design. After several prototypes and many modifications, the cone harvester has become an efficient and reliable machine (For specifications, see Appendix A). All producing seed orchards are mowed a few days before cone harvest to

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facilitate the operation of the cone harvester. During the harvest, the machine operator begins cone pickup next to an orchard tree. The tight turning circle of the machine allows the operator to move in a tight spiral around the tree (Figure 1). On the average, three to five slash pine cones remain on the ground after the machine moves around a tree. Loblolly cones are generally smaller than slash cones and seven to ten cones are left on the ground. One person then follows the machine and picks up by hand any remaining cones.

Pine cones on the orchard floor are picked up by two paddle wheels in the machine pickup head. The cones are then transferred via two conveyor belts to a 20 bushel crate on a small trailer towed behind the machine. Light weight trash such as mowed grass, pine needles, and small sticks are removed from the pine cones when the cones pass through a high speed air stream prior to their deposition in the crate. Large sticks and other heavy objects are not removed. The machine is powered by a 30 horsepower air-cooled engine and all mechanical systems are hydraulically driven including the pickup head which automatically adjusts (floats) to small contour changes in the orchard floor. The pickup head will not collect pine cones in holes or other depressions in the orchard floor. The machine has two front drive wheels and a single steering wheel in the rear. Increased efficiency and speed of cone pickup off the orchard floor are among the advantages of using the mechanical cone harvester. The greatest benefit is the reduction in labor costs since fewer temporary employees are needed.

Detailed information on the cone harvester mechanical specifications and current cost of the machine are available from:

Fred Parks
Albany Tractor Co.
1709 South Slappy Blvd.
Albany, Georgia 31701
(912) 432-7468

The Weiss-McNair cone harvester is manufactured by:

Weiss-McNair Incorporated
531 Country Drive
Chico, CA 95926
(916) 891-6214

Figure 1. A typical cone harvest pattern around an orchard tree.

Appendix A. Weiss-McNair Cone Harvester Specifications.

GENERAL

Engine - - Wisconsin Model VH4D; 30 h.p. @ 2800 RPM

Transmission - - Eaton Hydrostatic

Hydraulic Pump - - Sperry Rand

Power Drive Wheels - - Two 26 X 12.00 X 12 Knob Grip Tires

Steering Rear Wheel - - One 18 X 9.50 X 8 Turf-Saver

Hydraulic Oil - - 12 gallon capacity

Gasoline - - 12 gallon capacity

Fuel Consumption - - 2 gallons per hour

FLOATING PICKUP HEAD

Size - - Five Feet Wide; Three Feet High; Three Feet Long

Paddle Wheels - - One 30 in. Diameter with 5 in. Rubber Paddles
- - One 10 in. Diameter with 5 in. Rubber Paddles

Conveyer Belt - - One 5 ft. X 12 in.; rubber

Tires - - Two 13 X 6.50 X 6

CONVEYER TO CONE CRATE

Conveyer Belt - - one 12 ft. X 10 in.; chain link

Blower Fan - - 24 in. X 9 in. Paddle Fan

Air Duct - - 12 in. Diameter To 5 in. X 10 in. Air Shoot

Metal Cone Slide - - 16 in. X 30 in. Metal Slide @ 45° Angle To Crate

CONE CRATE TRAILER

Capacity - - One 20 Bushel Crate

Trailer - - Metal Frame

Tires - - Two 4.80 X 8