

## AN INEXPENSIVE AND COMPACT CONIFER SEED EXTRACTOR<sup>1</sup>

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An account is given of how a conifer seed extractor was constructed with parts salvaged from a commercial front-end loader washer.

Each year personnel at the Mora Tree Farm collect conifer seed cones from white fir (*Abies concolor* (Gord. and Glend.) Lindl.) and Douglas-fir (*Pseudotsuga menziesii* (Mirb.) Franco) for performance-progeny trials. In the past, small lots of air-dried cones were taken to a commercial seed extraction plant. Since this process was expensive, time consuming, and increased the probability of seed-lot mislabeling, a small extractor was built for laboratory use. Because others may need a simple-to-build seed extractor for laboratory work, the unit constructed is described.

Originally, an extractor designed and reported by A.S. Harris (1) was constructed because it was simple, inexpensive to build, and required a small space.

After analyzing the problem, it was decided that a cheaper model could be constructed using parts from a used washing machine. From one of several models of automatic front-end loader washers, a revolving drum similar in size to the 13 1/2- by 20-inch diameter wood-frame drum described by Harris was obtained. In addition, V-belts, pulleys, pulley mounts, the outer

tub, and the motor were salvaged and used in the extractor. Since the washer inner drum was already solidly mounted to a drive shaft, the necessity to build a wood-frame drum and mount it on lathe faceplates and axle was eliminated. Also, pillow blocks were not needed since the revolving drum and shaft could be suspended in an extractor by original mounts.

The completed extractor consisted of a plywood-covered frame that supports a washer drum and its housing (figure 1). It stood 55 inches high and had vertical sides 32-1/2 by 44-1/2 inches and 15-1/2 by 44-1/2 inches. The drum was powered by a single-phase 1/4-horsepower motor belted through two pairs of pulleys to provide a drum speed of 30 rpm (sufficient to afford proper tumbling action). A wood block was used to mount the 8 1/2- and 3-inch idler pulleys from washer to the extractor (figure 2).

Inner and outer drums were slightly modified (figure 3) by cutting out sections as follows: Without disturbing the vanes, six 6 1/2- by 9 1/2-inch sections were cut from the 11 1/2- by 10-inch diameter inner drum. The periphery of the drum was then covered with a 11- by 61-inch

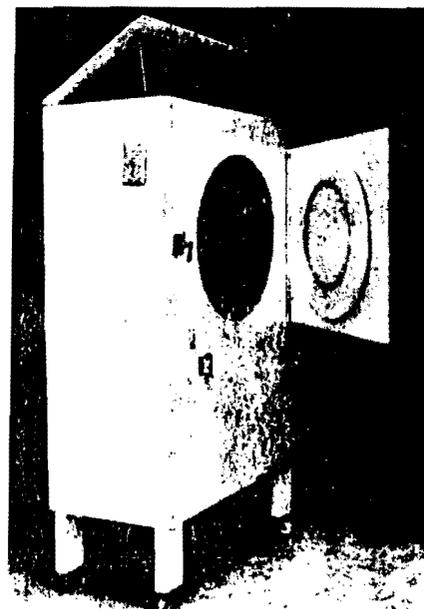


Figure 1.— The seed extractor with hatch and lid open.

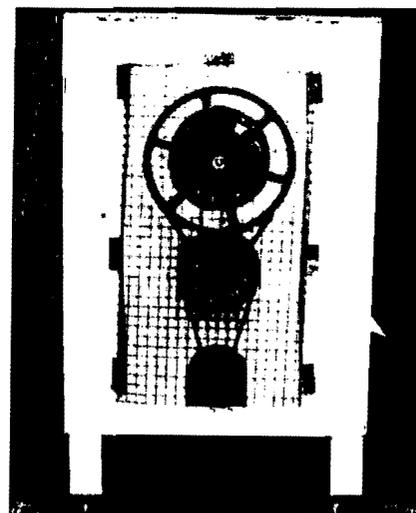


Figure 2.— Rear view of seed extractor showing motor drive assembly.

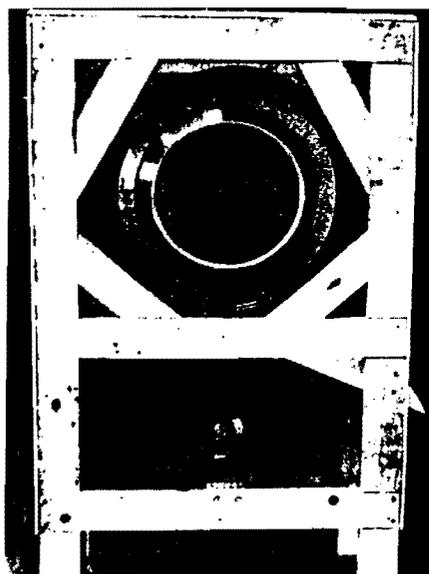
<sup>1</sup>Journal article 606, Agricultural Experiment Station, New Mexico State Univ., Las Cruces, N.M. 88003



**Figure 3.**— Top view of seed extractor with lid open to show how inner and outer washer drums were modified to accommodate hardware cloth.

strip of 1/2-inch hardware cloth secured with metal screws. A 12-by-12-inch square was cut from the top of the outer drum so that cloths of various mesh can be easily interchanged. The plywood top of the extractor was hinged for the same purpose (figure 1).

A 7-by-12-inch section was removed from the bottom of the outer drum so that the seeds fall to a chute below during extraction (figure 4). Any type of receptacle can be used to collect the seeds falling from the chute.



**Figure 4.**— The seed extractor with front panel removed.

The extractor will hold about one-half bushel of cones. After seed and cones are separated, the swivel-mounted funnel used to load the extractor is used to remove cones and debris while the drum is revolving. Only the mount for the funnel is shown in figure 1.

Since the extractor has no heating elements, cones must be open prior to extraction. This is done by spreading freshly

collected cones on burlap-lined benches in the greenhouse until they open or, in the case of white fir, begin to shatter. If necessary, cones and loose seed can be stored in a walk-in cooler maintained at  $0 \pm 1^\circ \text{C}$  prior to extraction. Whether these materials are temporarily stored in burlap or polyethylene bags before extraction depends upon the moisture content of the seed.

The labor and cost involved in constructing such an extractor will of course depend upon one's situation. Ideally, labor should not exceed a day, and total cost should range from \$20 to \$100.

The extractor described was used a great deal last fall and gave excellent service. Because it incorporates the solid construction of a commercial washer, it is quite sturdy and operates smoothly. For the individual or laboratory who has access to the parts mentioned and to metal cutting equipment, the extractor described offers a logical alternative to one requiring a wood-frame drum.

#### Literature Cited

1. Harris, A.S. 1970. A Compact Laboratory Seed Extractor. *Tree Planters' Notes* 21(3): 8-9.