in the sectioned cones along with the full seed. The number of full seed divided by total seed (full and empty) then gives an estimate of sound seed percent. This was done for 400 cones used in the present study and an estimate of 67.5 percent sound seed was obtained. In comparsion, the percentage determined by actual extraction and counting of full and empty seeds was 71.3. The difference (3.8 percent) was probably due to inaccuracies in distinguishing between intact empty seeds in the sectioned cones (which usually appear along with full seed upon extraction) and defective or aborted ovules (which are not extractable). Incomplete separation of full and empty seed by the seed blower would also be a factor. However, the discrepancy is not great, so the cutting technique can also be used to obtain a fair estimate of sound seed percent.

Additional Relationships

Positive correlations significant at the 1-percent level were found between cone size and seed weight ($r = 0.750$, 14 d.f.), cone size and number of sound seeds per cone ($r = 0.642$) and total number of seeds per cone and percent sound seed ($r = 0.630$). No significant correlation was found between sound seed per cone and seed weight, or between *Laspeyresia* damage or rate of infestation and any of the other variables measured.

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Hog-Ringer Speeds Seed Trap Construction

Abstract. An upholsterer's hog-ringer, with Hill's No. 1 pig rings, increased production of one-foot-square wire seed traps by 25 percent. A design modification allowed two bottom sections to be cut from a 36-inch roll of wire.

The one-foot-square wire seed trap described by Boe[1] and tested by Roy[2] has had extensive use at Challenge Experimental Forest, Challenge, Yuba County, Calif. The Soper-Wheeler Company of Strawberry Valley, Calif., the project cooperator, contracted to construct about 800 traps a year in 1962 and 1963.

At first, considerable difficulty was experienced in wiring tops to sides. In addition to the problem of manipulating tie-wires inside the trap, the workman's hands became badly scratched by sharp wires on the raw edges of hardware cloth. In looking for improved methods, the Company tried both a livestock and an upholsterer's hog-ringer. Jaws of the livestock hog-ringer were too wide, but the upholsterer's hog-ringer (Fig. 1) was very successful. The rings could be clamped to the traps from the outside with the plier-like ringer (Fig. 2), practically eliminating scratches on the hands. A 25-percent increase in the rate of trap construction resulted.

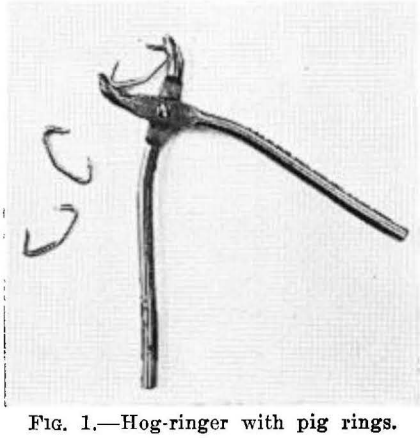

FIG. 1.—Hog-ringer with pig rings.

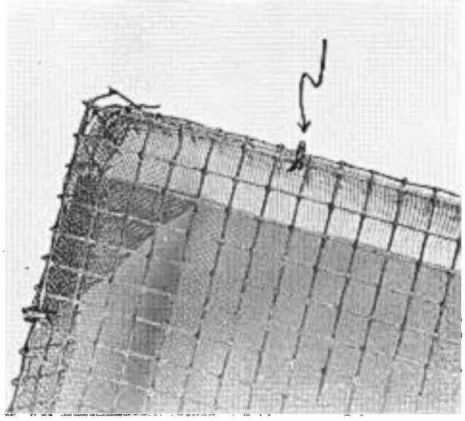

FIG. 2.—Seed trap detail, showing pig rings in place (arrow).

The upholsterer's hog-ringer costs less than $1.25. The Company used Hill's No. 1 pig rings with it. These cost about $2 per 1,000. Eight rings were used for each trap.

Modification in trap design resulted in a saving in materials. The window screen bottom and sides were cut 18 inches square instead of 20 inches. This permitted two squares to be cut from a roll of screen 36 inches wide.

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[1] Boe, Kenneth N. A one-foot-square wire seed trap. Jour. Forestry 53:368-369. 1955.

[2] Roy, D. F. Small seed traps perform well in the Douglas-fir type of California. U. S. Forest Service, Pacific Southwest Forest and Range Expt. Sta. Res. Note 150. 7 pp. Illus. 1959.