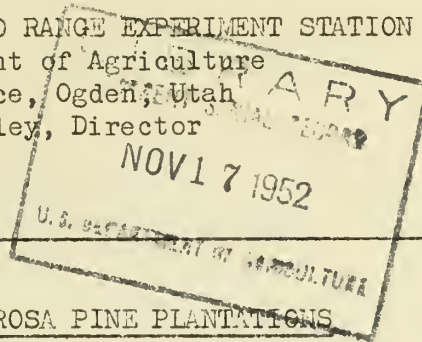


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INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION

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 Reed W. Bailey, Director



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RODENT DAMAGE IN PONDEROSA PINE PLANTATIONS

Alvin K. Wilson, Forester

Initial establishment of ponderosa pine (Pinus ponderosa) stands, by both natural and artificial means, is made difficult by infrequent seed years, low precipitation, and plant competition. These difficulties are aggravated by the feeding of the snowshoe hare (Lepus americanus) and the western porcupine (Erethizon epixanthum) which takes the form of bark and branch removal from the stems of surviving seedlings and small saplings up to 6 feet in height thus disfiguring, weakening, or killing the trees. Both rodents are present on all sites where ponderosa pine is likely to be planted, or is found in natural stands, in the Intermountain region. Feeding by the hare tends to be most frequent where snowbrush (Ceanothus velutinus) provides cover against predators. Porcupines will locate the scattered wildlings and planted stock even in large burns when they are growing several miles from the margin of timber.

To determine the extent and nature of feeding by both rodents, examinations were made by running randomly located 0.5 chain strips through each of two 10-year old plantations some 6 miles apart in the Boise Basin of south central Idaho. Trees were tallied by two height classes (under 3 feet and over 3 feet) and three condition classes, no feeding, damaged (but not girdled), and girdled. Few stems exceeded 6 feet in height. Table 1 shows the percentages damaged and girdled by feeding.

Table 1.--Percentage of seedlings and small saplings by condition classes and the number of trees examined in two 10-year old plantations in central Idaho

	Not	Fed on		No. trees examined
	fed on	Damaged	Girdled	
	Percent	Percent	Percent	
Granite Creek	79.3	18.4	2.3	87
Elk Creek	76.9	18.9	4.2	353

Further analysis was made in testing several hypotheses by use of chi-square analysis along the lines suggested by Snedecor.^{1/} The following interpretations were made:

1. For the two plantations, the percentages of trees falling in each of the three condition classes were essentially the same, indicating that the same extent and kinds of injury can be expected regardless of location.

2. The degree of feeding on trees under 3 feet in height is significantly less than the degree of feeding on trees over 3 feet in height. For the former 12.9 percent is an unbiased estimate of the proportion fed on; for the latter 29.0 percent is an unbiased estimate of the proportion fed on.

3. The number of trees in each injury (or noninjury) category is in direct proportion to the sample size.

4. The ratio of undamaged to damaged to girdled trees follows approximately an assumed 16:4:1 ratio, respectively.

From observation there are no sizable sections of either plantation in which trees are girdled to such an extent that understocking now exists. Since feeding by these rodents is continuing, however, understocking could become a reality in the near future.

It is obviously desirable to minimize damage by large rodents in young plantations like those described here. The two methods of accomplishing this are direct and indirect control of the mammals involved. In all areas requiring artificial regeneration, but especially in large burns, direct control measures by poisoning are made difficult by the presence of stock. Despite this it is still possible and perhaps advisable to poison, even though the initial cost of plantation establishment is increased. Indirect methods, though less obvious, but certainly less expensive, are applied by encouraging natural enemies. The open season in Idaho on all hawks and owls, the reduction in numbers of cougar, and the organized poisoning of the coyote militate against the natural control of these large rodents. An adjustment of the regulation applying to birds would be a limited but forward step in reducing numbers of these undesirable rodents and protecting the growing stock in Idaho plantations.

^{1/} Snedecor, George W., Statistical Methods. 4th Ed., 485 pp. Ames, Iowa. 1946.

