TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION
UNIVERSITY FARM ST. PAUL, MINNESOTA

The Animal Factor in Natural Reproduction of Jack Pine

The quantity of coniferous seed eaten by small rodents and birds has been the subject of study by the Station's biologist. Because the animals involved are small, elusive, and mostly nocturnal, direct observation of their seed-eating habits is almost impossible. Several indirect approaches have been attempted and the results permit a few generalized statements to be made.

In order to determine what species do eat coniferous seed, part of an area with cone-bearing jack pine slash was trapped throughout the summer. The contents of the stomachs of the animals caught on the area were analyzed. In all, 45 stomachs were examined, distributed as follows:

White-footed mice	22	Chipping sparrows	8
Red-backed mice	9	Juncos	2
Western chipmunks	1	Jumping mice	3

Jack pine seeds were found in the stomachs of only two species--the chipping sparrows and the white-footed mice. Thirty-eight percent of the chipping sparrows and 45 percent of the white-footed mice had been feeding on these seeds. The number of seeds eaten in each case was usually small, although two of the mice had consumed 60 and 20 seeds respectively. In addition to these findings, jack pine cones that had been reduced to middens by red squirrels were found on the area.

In order to determine the amount of seed eaten, counted quantities of jack pine seeds were placed in small low-sided screen baskets. These were exposed in the woods for 10 days. At the end of that time 64 percent of the seeds were missing. The presence of empty hulls in some cases was evidence of the work of small rodents. However, some losses were encountered on the check plots which could only be attrib uted to the activity of insects as it was impossible for birds or rodents to get access to them. In contrast to this, planted jack pine seeds unprotected except by soil coverage suffered only a 39-percent loss and planted seeds that were protected from birds and rodents suffered only an 18-percent loss. Part of the latter-termed losses were in reality germination failures and possibly some insect damage. White pine seeds showed 11 percent better germination on protected plots.

In another test jack pine cones were marked and set on the ground to open. After being exposed for 15 days a count of the remaining seeds was made and showed approximately a 15-percent loss due to rodents or birds.

The conclusions which can safely be drawn from these studies are: (1) Small rodents and birds do have a part in restricting natural reproduction of conifers; (2) in the case of jack pine, animal losses can be reduced if the soil has been suitably prepared for the seeds when they fall, and (3) indications are that white-footed mice and chipping sparrows are the most important offenders.

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