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SUGAR MAPLE BARK INJURY BY GRAY SQUIRRELS IN A MINNESOTA WOODLOT

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Where sugar maple (Acer saccharum Marsh.) occurs in Minnesota, branches stripped of bark are occasionally noted in the spring. This injury is often caused by gray squirrels. A study of this activity was started in the spring of 1956 as a phase of a cooperative research project already in progress on the St. John's University Forest in Stearns County, Minnesota. Observations made during routine field work on this forest suggested that the squirrel activity might have management importance here.

The gray squirrel is found in Minnesota wherever there are mast bearing hardwoods and is most abundant where there are large blocks of ungrazed, mature hardwood timber. It is active throughout the year, but may hole up for several days during periods of severe winter weather. The presence of gray squirrels in a woodlot is evidenced by the tunnels and holes in the snow made during their search for nuts stored earlier. Gray squirrels sometimes eat the bark of certain hardwood trees during the dormant season. Their bark feeding activity can be separated from that of the porcupine because the tooth marks are smaller, and the discarded outer bark is scattered underneath the tree in small chips.

Fig. 1. Four inch sugar maple girdled by gray squirrels.

Fig. 2. Past and current bark injuries on one tree.

The present study started with casual field observations of bark injury to sugar maples. As the need for quantitative information became apparent, data were collected on the type, severity, and position of current and past damage observed on 21 one-fifth acre plots in a well stocked red oak-sugar maple forest type.

The gray squirrel inflicts this injury by chipping off the outer bark and eating the inner bark, or phloem, and cambium tissues. The extent of

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injury varies from a small patch an inch or less in diameter to nearly complete stripping of the individual tree. It is largely confined to stems from one half to six inches in diameter, and is probably directly related to bark thickness.

If a stem is completely girdled, the top dies back to the girdled point. Repeated stem girdling produces crooked boles or trees with no central stem, and reduces merchantable length. Some mortality was observed as the result of severe past injury. Some trees had been injured repeatedly and in extreme degrees, while neighboring sugar maples were injured slightly or not at all. Some trees which showed no evidence of past damage were hit hard between October, 1955, and March, 1956. Figures 1 and 2 illustrate typical injuries found at St. John's.

This activity is commonly assumed to occur during late winter and early spring, and to be associated with a shortage of other food. At St. John's, no current damage was observed on October 29, but a good start had been made by December 19. No fresh activity was noted after mid-March, but no special effort was made to establish the starting and stopping dates.

The data collected indicate that about one-third of the sugar maple trees had visible evidence of some squirrel damage. It is probable that small injuries which left no large scars were missed. Possibly some scars attributed to squirrels might have had other causes, but the observers tried to minimize this error by rejecting all items that were doubtful. Past damage was noted on 25% of the sugar maples, and current damage, from the winter of 1955-1956, on 19%. Most of the current damage inflicted on trees six inches d.b.h. and over is in the upper third and above the two-log merchantable bole.

Since all injuries are included in these data, not just those which will reduce merchantable timber values, and since past mortality from this cause is ignored, this figure cannot be taken as a direct measure of probable economic losses from squirrels.

Since red oak is the species desired for management on this area, the implications of squirrel damage to sugar maple are not simple. If the number of maples killed regularly by the squirrels is large, the forest owner has an automatic weeding device operating for him. If, however, the mortality is low and the chief result is reduction in value of the maple component without a reduction in its competitive vigor, then the net cost of stand improvement through removing maples may be greater than it would be with no squirrel damage.

This study will be continued to collect information on the variation in amount and type of damage over a period of several years. Case histories will be compiled for injured trees to provide a basis for predicting mortality, deformity and other defects resulting from specific classes of injury. When this information has been obtained, an attempt will be made to evaluate the importance of this factor, and the need for its control.

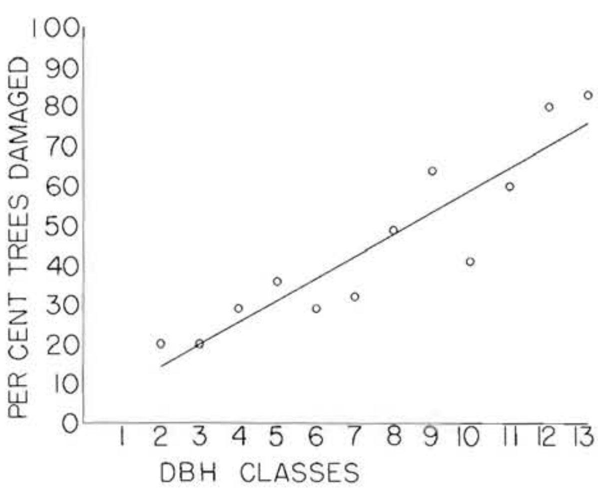

Fig. 3. Relative frequency of squirrel damage by diameter classes for 417 sugar maples.
(r is .92; significant at P=.01)

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