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Cap. 2

TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION
U.S. DEPARTMENT OF AGRICULTURE . FOREST SERVICE

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CURRENT SERIAL RECORDS

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Jack Pine From Lake States Seed Sources
Differ in Susceptibility to Attack by the White-Pine Weevil

During the 1953 and 1954 growing seasons 17 jack pine seed source plantations were established in the three Lake States.^{1/} The plantations consist of four replications of a randomized block design, each replication with 30 seed sources. Sixty-four trees of 2-0 stock from each source were set out in 40-foot square blocks with a 5x5-foot spacing. One of these plantations was established on the Chippewa National Forest near Cass Lake, Minn. Measurements of this plantation in August 1958 (fifth year) showed that as high as 23 percent of the trees of a seed source were found to be currently damaged by the white-pine weevil. This afforded an opportunity to study susceptibility of seed sources to damage by this pest.

Preliminary analysis of the 1958 attacks revealed a highly significant difference between seed sources. To obtain stronger evidence the plantation was examined again during August 1959. The data for 1958 and 1959 were combined and subjected to an analysis of variance. Appropriate precautions were taken to insure additivity and homogeneity of variance. The analysis of variance is as follows:

<u>Source of variation</u>	<u>Degrees of freedom</u>	<u>Mean squares</u>
Replications	3	1.05**
Seed sources	29	1.11**
Error	87	.22
Total	119	

**Significant at the 1-percent level.

Table 1 shows a comparison between sources for mean numbers of trees weeviled per acre per year. Significantly more weeviling occurred in the sources from Pine County, Minn.; Douglas, Burnett, Marinette, Oneida, and Wood Counties, Wis.; and Gogebic County, Mich., than was observed in the local source. No source had significantly less damage than the local stock. The basic cause for the difference is obscure, but it is believed to be some characteristic of these trees. It is also possible that these sources planted elsewhere may respond differently to other weevil populations. Further investigation is necessary before the responsible factors are known.

It is apparent that considerable care should be exercised when selecting seed for planting stock, even within the natural range of jack pine. Over the entire rotation of these trees it will be difficult to evaluate the growth characteristics of the different seed sources that are due to genetic differences because weeviling may mask them.

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^{1/} "Work plan for a regional jack pine seed source study in the Lake States" by Paul O. Rudolf and T. Schantz-Hansen, July 7, 1953; on file at the Lake States Forest Experiment Station.

(over)

Table 1.--Mean number of trees weeviled per acre per year during 1958 and 1959.
Chippewa National Forest plantation, regional jack pine seed source study.

State and county of origin	Seed source number	Mean no. of trees weeviled per acre per year
MINNESOTA		
Cass	1589	34.4
Cass	1590	32.5
Itasca	1591	26.3
Lake	1592	33.5
Cook	1593	36.7
St. Louis	1594	35.8
Pine	1595	125.6**
Pine	1596	114.1**
Becker	1597	48.2
Cass	1600	47.1
Beltrami	1601	30.2
Itasca	1602	49.8
Cass	Local	33.5
WISCONSIN		
Douglas	1604	99.1**
Bayfield	1605	12.1
Forest	1606	50.9
Oneida	1607	60.3
Burnett	1608	97.6**
Marinette	1609	114.1**
Oneida	1610	108.5**
Wood	1611	116.5**
MICHIGAN		
Gogebic	1612	104.5**
Ontonagon	1613	47.1
Alger	1614	56.1
Chippewa	1615	60.3
Manistee	1616	44.9
Ogemaw	1617	56.1
Alpena	1618	63.3
Grand Traverse	1620	30.8
Luce	1621	32.1

**Significant at the 1-percent level when compared with local source.