

### Regional Jack Pine Seed Source Study

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In 1951 the Lake States Forest Experiment Station and the University of Minnesota jointly drew up plans for a regional jack pine seed source study to complement two such tests already underway, one in Minnesota and one in Michigan, to study racial differences in jack pine within the Lake States.

Federal, State, and private forestry agencies collected cones from 29 jack pine stands in the three Lake States during 1951 and 1952. Stock was grown in state nurseries in Minnesota and Wisconsin.

The 2-0 stock was set out in 17 plantations in the Lake States, one of which is the plantation on the Chippewa National Forest. This plantation was established in May 1954 and contains all of the 29 sources plus a "local" source. A 2-row isolation strip surrounds the plantation.

A randomized block design with four replications was used in all the plantations. Each seed origin was represented in each block by a 64-tree plot arranged in 8 rows of 8 trees at a 5 x 5-foot spacing.

Survival counts made at the end of the first, second, and fifth growing seasons showed considerable variation between seed sources, but no definite patterns of differences were apparent.

At the end of the fifth year in the Chippewa National Forest Plantation Source 1595 from St. Croix State Park in Minnesota was the tallest, and Source 1605 from the Chequamegon National Forest in Wisconsin was the shortest. Average height development in this plantation was the poorest of the six Minnesota plantations and was only slightly over 50 percent of that in the best Minnesota plantation.

Repeated attacks of various insect pests probably account for much of the poor development of this planting. Striking apparent differences between seed sources in susceptibility to the jack-pine shoot moth and white-pine weevil were revealed by the fifth year observations.

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Lammas growth and prolepsis occurrence in 1958 in this plantation differed significantly between seed sources. These late shoots occurred most frequently in the more southerly sources and least often in the northern sources (see table 1).

Further information on the early results of this jack pine seed source study is available in the following publications:

Arend, John L., Smith, Norman F., Spurr, Stephen H., and Wright, Jonathan W. 1961. Jack pine geographic variation--five-year results from Lower Michigan. Mich. Acad. Science, Arts, and Letters Papers 46: 219-238.

Batzer, H. O. 1961. Jack pine from Lake States seed sources differ in susceptibility to attack by white-pine weevil. U.S. Forest Serv., Lake States Forest Expt. Sta. Tech. Note 595, 2 pp. (Processed.)

Jensen, Raymond A., Schantz-Hansen, T., and Rudolf, Paul O. 1960. A study of jack pine seed source in the Lake States. Minn. Forestry Notes No. 88, 2 pp. (Processed.)

King, James P., and Nienstaedt, Hans. 1963. Variation in needle cast susceptibility among 29 jack pine seed sources. (Ms. in preparation for publication.)

Rudolph, T. D. 1963. Lammas growth and prolepsis in jack pine in the Lake States. (Forest Science Monograph in press.)

Stoekeler, J. H., and Rudolf, Paul O. 1956. Winter coloration and growth of jack pine in the nursery as affected by seed source. Zeitschr. Forstgen. Forstpflanzenzllchtung 5: 161-165.

Table 1.--Characteristics of the jack pine seed source plantation on the Chippewa National Forest in 1958 after 5 years in the field

Source no.	Origin	Survival	Ave. height	Trees injured by J.P. shoot moth	Trees injured by white-pine weevil	Trees with lammas growth	Trees with prolepsis
		Percent	Feet	Percent	Percent	Percent	Percent
Local	Chippewa N.F.	89	2.8	13.2	2.6	---	---
1589	Chippewa N.F.	86	2.8	7.7	4.1	11.5	19.7
1590	Chippewa N.F.	91	3.0	10.3	3.0	--	--
1591	Cutfoot Expt. For.	86	2.9	11.9	2.7	--	--
1592	Superior N.F.	93	2.8	13.4	2.9	--	--
1593	Superior N.F.	95	2.9	19.0	3.3	1.9	2.8
1594	Superior N.F.	91	3.0	15.9	3.4	--	--
1595	St. Croix State Park	89	3.3	9.2	12.3	--	--
1596	Gen. Andrews Expt. For.	92	3.1	7.7	12.3	4.5	16.1
1597	White Earth S.F.	89	3.0	9.1	4.4	--	--
1600	Crow Wing S.F.	89	2.9	15.0	3.5	--	--
1601	Miss. Headwaters S.F.	89	2.7	8.3	3.1	2.9	5.7
1602	Geo. Wash. S.F.	91	2.9	9.9	5.2	--	--
1604	Mosinee Ind. For.	86	3.2	8.6	8.6	--	--
1605	Chequamegon N.F.	84	2.6	6.5	1.8	--	--
1606	Nicolet N.F.	86	2.8	10.4	5.9	--	--
1607	Nicolet N.F.	83	3.1	8.9	6.6	--	--
1608	Burnett Co. For.	89	3.2	11.9	7.5	--	--
1609	Marinette Co. For.	87	3.1	7.2	9.9	13.8	16.0
1610	Nepco Ind. For.	84	3.0	11.1	8.8	14.6	16.7
1611	Nepco Lake Area	90	3.1	11.7	11.3	19.3	34.1
1612	Ottawa N.F.	91	2.9	9.5	12.1	--	--
1613	Ottawa N.F.	85	3.1	12.0	3.2	--	--
1614	Hiawatha N.F.	87	3.0	12.6	4.5	--	--
1615	Marquette N.F.	85	2.7	12.4	6.9	--	--
1616	Manistee N.F.	87	3.1	9.0	4.5	20.4	35.5
1617	Ogemaw S.F.	85	3.0	11.5	5.5	--	--
1618	Alpena S.F.	80	3.2	12.7	8.3	9.8	17.4
1620	Huron N.F.	76	3.2	3.6	4.1	--	--
1621	Lake Superior S.F.	82	2.6	17.7	4.3	5.7	12.6