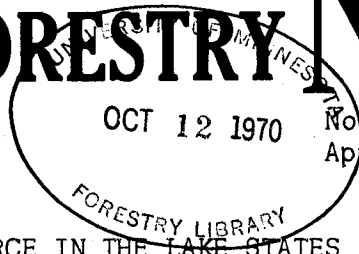




MINNESOTA FORESTRY NOTES

COPY 2



A STUDY OF JACK PINE SEED SOURCE IN THE LAKE STATES
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Jack pine (*Pinus banksiana* Lamb.), a widely planted species in the Lake States (Minnesota, Wisconsin and Michigan), has considerable differences in its growth habits from area to area. Although foresters have recognized these variations, little attention has been paid to them when selecting stock for planting, and the role of heredity in this variation has not been known.

To complement two jack pine seed source studies already established (one in Minnesota and one in Michigan), the University of Minnesota School of Forestry and the Lake States Forest Experiment Station proposed and planned a regional study. Answers to the following questions are sought: (1) Are there important heritable racial differences in jack pine native to the Lake States?; (2) If so, are local seed sources best?; and (3) Are there seed sources that will perform better than local seed sources in some localities?

Cooperators in the study are the United States Forest Service; the Conservation Departments of Minnesota, Wisconsin and Michigan; Burnett and Marinette Counties in Wisconsin; the Mosinee Pulp and Paper Mills Company and the Nekoosa-Edwards Paper Company. Cone collections were made from dominant and codominant trees in 29 different jack pine stands in the Lake States. The seed was extracted at the University of Minnesota Cloquet Forest Research Center and tested for germination by the Lake States Forest Experiment Station in St. Paul. The nursery stock was grown at the General Andrews State Nursery, Willow River, Minnesota and the Hugo Sauer State Nursery, Rhinelander, Wisconsin. Three-fourths of the seed was planted in the spring of 1952 and the remaining one-fourth in the spring of 1953. Stock from the latter sowing was used to replace first-year field mortality.

The 2-0 stock was set out in 17 plantations: six in Minnesota, six in Wisconsin, and five in Michigan. One plantation (in Minnesota) was established in the fall of 1953; the others were planted in the spring of 1954. Failed spots were planted with 2-0 stock in the spring of 1955. Each planting, with one exception, contains all of the 29 sources plus a source (designated as "local") selected from stock grown in each nursery for general distribution. The exception contains only 14 of the sources plus the "local" source. A 2-row isolation strip of "local" stock surrounds each plantation. Each source is replicated four times in each plantation. Each replication for a single source consists of 64 trees planted with a 5 x 5 spacing. The map shows locations of the cone collection areas, plantations and nurseries in relation to the seed collection zones proposed by the Lake States Forest Tree Improvement Committee.^{2/}

The results of survival counts at the end of the first and second years were summarized in informal reports to the cooperators. A third examination was made at the end of the fifth growing season to determine mortality and its probable causes, height growth, and important causes of injury. A summary of average heights and stocking for the six Minnesota

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^{2/} Rudolf, Paul O. 1957. Forest tree seed collection zones for the Lake States. (A publication of the Lake States Tree Improvement Comm.) Forestry Div., Mich. Dept. of Conservation.

plantations appears in the Table. A more detailed analysis is in preparation. Local reports on results in other states may be prepared by other cooperators, and special reports on insects and diseases in some of the Minnesota plantations will be prepared cooperatively by the University of Minnesota's School of Forestry, Department of Entomology and Economic Zoology, and Department of Plant Pathology and Botany.

1958 Average Height and Stocking Percent - Minnesota Plantations*

Seed Source No.	State and County of Origin	Pillsbury S. F.		Sand Dunes S. F.		Gen. Andrews Expt. F.		Cloquet F. R. C.		Chippewa N. F.		Superior N. F.	
		Av. Ht. Ft.	Stocking %	Av. Ht. Ft.	Stocking %	Av. Ht. Ft.	Stocking %	Av. Ht. Ft.	Stocking %	Av. Ht. Ft.	Stocking %	Av. Ht. Ft.	Stocking %
MINNESOTA													
1589	Cass	5.1	77	-	-	4.8	95	5.8	97	2.8	86	4.2	95
1590	Cass	5.2	75	5.0	76	4.2	84	6.2	92	3.0	91	4.2	92
1591	Itasca	5.2	79	5.4	92	4.5	93	5.6	99	2.9	86	4.6	95
1592	Lake	5.6	72	5.2	82	4.2	93	5.8	99	2.8	93	4.6	96
1593	Cook	5.2	74	4.7	93	3.9	93	5.0	98	2.9	95	4.3	97
1594	St. Louis	5.4	76	5.1	73	4.2	92	5.8	100	3.0	91	4.7	96
1595	Pine	5.8	67	5.9	71	4.5	93	5.8	99	3.3	89	4.7	94
1596	Pine	5.6	80	-	-	4.6	94	5.8	98	3.1	92	4.7	92
1597	Becker	5.3	72	5.2	75	4.2	89	5.6	98	3.0	89	4.4	94
1600	Cass	5.5	75	5.4	81	4.4	90	5.6	95	2.9	89	4.3	95
1601	Beltrami	5.5	81	4.9	75	4.1	94	5.0	98	2.7	89	4.2	95
1602	Itasca	5.3	69	5.4	90	4.1	96	5.7	98	2.9	91	4.3	93
WISCONSIN													
1604	Douglas	5.0	70	-	-	4.0	80	4.7**	88**	3.2	86	4.4	94
1605	Bayfield	5.0	83	-	-	3.9	91	4.2	96	2.6	84	3.5	94
1606	Forest	2.7	42	-	-	4.0	87	4.4	96	2.8	86	4.5	93
1607	Oneida	5.2**	70**	-	-	3.7	82	4.9**	95**	3.1	83	3.8**	89**
1608	Burnett	5.8	71	-	-	4.1	87	5.0**	98**	3.2	89	4.7	95
1609	Marquette	5.1	67	5.4	79	4.2	90	4.9	87	3.1	87	4.0	91
1610	Oneida	5.5	56	-	-	4.7	93	5.5	95	3.0	84	4.6	94
1611	Wood	6.0	73	5.8	85	4.4	81	5.8	96	3.1	90	4.2	93
MICHIGAN													
1612	Gogebic	5.5	54	5.4	79	4.1	91	5.6	97	2.9	91	4.3	94
1613	Ontonagon	5.7	75	-	-	4.5	91	5.3	99	3.1	85	4.8	92
1614	Alger	5.0	80	-	-	3.5	90	5.2	97	3.0	87	4.2	97
1615	Chippewa	5.3	79	-	-	3.6	93	4.3	98	2.7	85	4.1	96
1616	Manistee	6.2	57	-	-	4.2	88	5.2	96	3.1	87	4.6	90
1617	Ogemaw	5.8	66	-	-	4.0	79	4.8	90	3.0	85	4.0	89
1618	Alpena	6.1	84	-	-	4.3	95	6.0	98	3.2	80	4.1	93
1620	Grand Traverse	7.0**	65**	-	-	4.9	97	5.9	96	3.2**	76**	4.5**	79**
1621	Luce	5.2	78	5.0	82	3.7	98	5.0**	96**	2.6	82	4.3	96
Local	-----	5.6	67	5.3	73	3.4	82	5.6	98	2.8	89	4.8	93

* Five years after field planting
** Other seed sources used as substitutes

