



# MINNESOTA FORESTRY NOTES

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## JACK PINE VARIATION AND DISTRIBUTION IN MINNESOTA (1)

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During the past year a preliminary survey of the distribution and variation in jack pine (*Pinus banksiana*) native to Minnesota was initiated. The primary objective of the survey was to locate trees and stands with unusual characteristics of possible usefulness in the University's tree improvement program. Although major emphasis was placed on jack pine, individual trees and stands of other species displaying characters of potential genetic interest were also noted.

To obtain as complete a survey as possible within a reasonable time, while benefiting from a variety of views as to unusual trees and a wealth of available experience, federal, state, and industrial foresters and others were interviewed. Whenever possible, the stands recommended by these workers were visited for observation.

Approximately 100 individual trees and stands with characteristics of genetic interest were located and described. Photographs were taken of the most unusual trees and stands observed. These photographs as well as maps with the stand locations supplement a detailed report of this preliminary survey on file in the School of Forestry.



Fig. 1. Jack pine cones on typical branches from three adjacent trees. Note the variation in size, shape and angle of inclination with the branch.

The major variations observed in jack pine were in the characteristics of the cones, stem and crown form, apparent vigor, and disease and insect resistance.

Some evidence was found to support the hypothesis that the closed or "serotinous" cone character in this species (Fig. 1)

shows a gradual or clinal change from predominantly closed-cone types in the northeast to open-cone types in the southern part of the range in Minnesota. Since delayed cone opening is very likely a character of positive selection value in repeatedly burned areas, the possibility is not discounted that geographical distribution of closed- and open-cone types may have been influenced to a considerable extent by the state's forest-fire history. The size and shape of cones, and the angle formed with the branch was found to vary within stands but was relatively uniform on individual trees. The three types of cones shown in Figure 1 were found on three adjacent trees in an old stand in Itasca County.

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Among the unusual branching habits observed was the fastigate type shown in Figure 2. This tree was found in a young stand in Crow Wing County in which most of the trees have branches borne at an angle of about  $50^{\circ}$  with the stem. The angle of branching on the tree in Figure 2 is as small as  $10^{\circ}$  near the top.

Several cases of apparent resistance to the jack pine budworm (*Choristoneura pinus*) and to pine-oak rust (*Cronartium cerebrum*) were found.

Trees of genetic interest selected in the survey will be vegetatively propagated and introduced into uniform test gardens at the North Central School and Experiment Station for further study. Tests of open and control pollinated progenies of selected trees and stands will also be established.

The botanical range of jack pine in Minnesota and western Wisconsin is shown in Figure 3. Two natural outlying stands in southeastern Minnesota have been previously reported. The first of these, described by Rosendahl and Butters (3), is found three miles west of Rushford, in the Root River Valley, northeastern Fillmore County. The second outlier stand is located in Section 14, T108N, R10W, on the Whitewater Game Refuge, Winona County. This stand first came to the attention of game management personnel working in this area several years ago. A third natural outlier stand was located during the past winter in connection with the present survey. The stand is located in Section 5, T109N, R9W, Wabasha County, on an area locally referred to as a "sand prairie," about five miles southeast of Kellogg, Minnesota. The area of the stand is about five acres. The oldest trees are from 55-60 years and up to 50 feet tall.



Fig. 2. Jack pine with fastigate branching habit. Variants of this type may be of ornamental value.

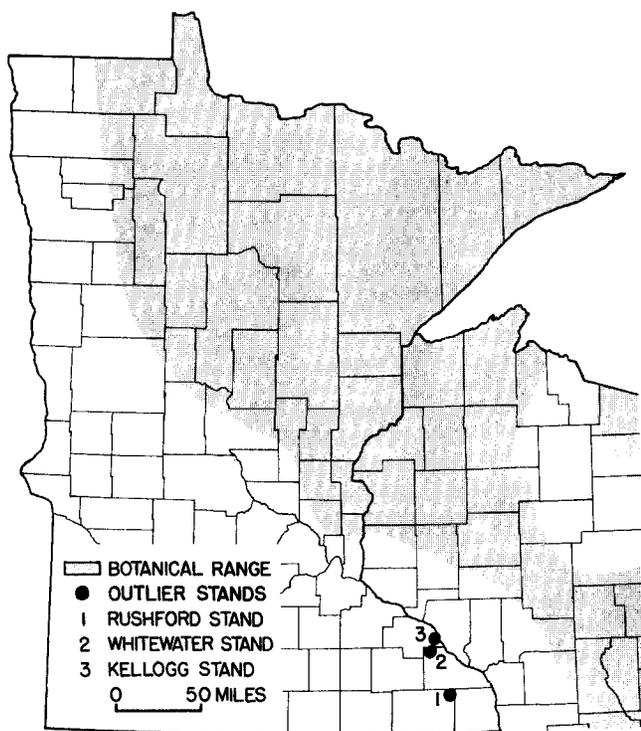


Fig. 3. The botanical range of jack pine in Minnesota and western Wisconsin based on Little (4), and herbarium collections of the Universities of Wisconsin and Minnesota.

(3) Rosendahl, C. O. and F. K. Butters. 1918. On the occurrence of *Pinus banksiana* in southeastern Minnesota. *The Plant World* 21:107-113.

(4) Little, E. L. 1949. Important forest trees of the United States. In U.S.D.A., *Trees*, Yearbook of Agriculture.