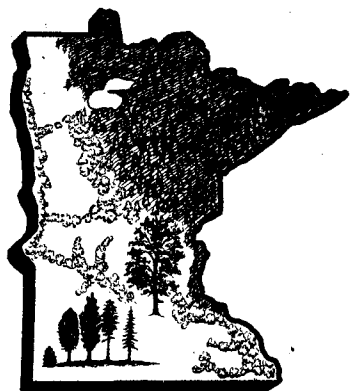
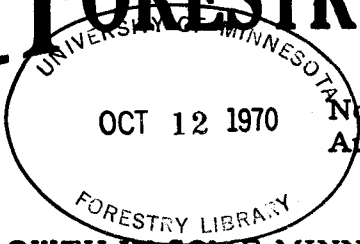


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# MINNESOTA FORESTRY NOTES



No. 32  
August 15, 1954

## SPECIES SURVIVAL AND HEIGHT-GROWTH IN SOME MINNESOTA WINDBREAKS

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The initial selection of species determines to a large degree the success of windbreak plantings. Species' adaptability to what are frequently difficult site conditions is extremely important. Also, the planting as a whole must meet the functional requirements of a good windbreak including: 1) protection to ground level; 2) maximum ultimate height; 3) year-round protection; 4) rapid growth; and 5) reasonably long life.

Data obtained in 1936 and 1948 on 64 and 119 windbreaks respectively, provide information on comparative height growth and on the survival of certain species with particular reference to the physical properties of the soils on which they were planted. The windbreaks studied represent a sampling of western and west-central Minnesota farmstead plantings made by farmers in the early 1920's cooperating with the School of Forestry, the Agricultural Extension Division of the University of Minnesota, and the Minnesota State Division of Forestry. Only those species planted in sufficient numbers to provide reliable data are included in the table and figure. Other species, some of which are well adapted to windbreak planting in Minnesota, are not included.

Relative survival is shown in the table. Two significant comparisons may be noted. First, hardwoods in general have shown appreciably higher survival than conifers. There is little doubt that conifers require more careful site selection and better care following planting than hardwoods. Once established, however, conifers have done as well as hardwoods. The 5 coniferous species on the 64 windbreaks covered in both surveys have shown an average post-establishment survival (between the 1936 and 1948 resurveys) of 77 percent compared with 75 per cent for the 6 hardwoods covered in both surveys.

Second, the hardwoods tested, with the exception of Northwest poplar (Populus sp.) (2), show no pronounced soil preference. The conifers tested, on the other hand, with the notable exception of Colorado (blue) spruce, show appreciably better survival on lighter soils.

Growth comparisons are shown in the bar graphs (see fig.). Species showing rapid early growth include Northwest poplar, boxelder, white willow and jack pine. Colorado spruce, although starting slowly, grew nearly as rapidly between ages 13 and 25 as such hardwoods as green ash and silver maple.

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- (1) Former graduate student and Associate Professors, respectively, University of Minnesota School of Forestry. Data are derived from field studies by the senior authors.
  - (2) Other scientific names according to Little, E. L., 1953. Check list of native and naturalized trees of the United States. U. S. D. A. Ag. Handbook 41.

**Relative Survival of Six Conifers and Six Hardwoods on Various Soil Types  
During First 25 Years Following Planting in Windbreaks**

Heavy Soils <u>1/</u>			Light Soils <u>2/</u>			All Soils <u>3/</u>		
Good Survival (60% to 85%)	Medium Survival (35% to 59%)	Poor Survival (34% or less)	Good Survival (60% to 85%)	Medium Survival (35% to 59%)	Poor Survival (34% or less)	Good Survival (60% to 85%)	Medium Survival (35% to 59%)	Poor Survival (34% or less)
-----	Colorado spruce Northwest poplar	Jack pine Scotch pine White spruce Red pine White pine	Jack pine	Scotch pine Red pine White spruce White pine	Colorado spruce Northwest poplar	Green ash Boxelder American elm	Silver maple	Willow <u>4/</u>

- 1/ Clays, clay loams, and silt loams.
- 2/ Sandy loams, loamy sands, and sands.
- 3/ Species listed here show no pronounced preference.
- 4/ White and laurel.

