CONDITION OF FORTY-YEAR-OLD MINNESOTA DEMONSTRATION FARMSIDE WINDBREAKS

Harold Scholten1/

Through the cooperation of the School of Forestry, the Agricultural Extension Division, and the State Division of Forestry, 330 demonstration farmside windbreaks were planted throughout Minnesota from 1919 to 1927. These windbreaks consisted of 6 to 10 rows of various conifer and hardwood species with spacings from 4 by 6 feet to 6 by 12 feet. In most plantings two rows of shrubs were placed some distance from the main break on the windward side to form a snow catch.

The original planners hoped that the owners would manage their windbreaks as small farm woodlands. They visualized early thinning operations producing fuelwood and fence posts, later thinnings producing poles and possibly some lumber, and the possibility of reproduction perpetuating the windbreak indefinitely.

During the summer of 1961, a study was made of a representative sample including 24 windbreaks located in five counties. This note reviews some of the results of past management practices.

Spacing: The close spacing recommendations of the original plantings were sound in that early, maximum protection was provided when the lower branches of the trees closed in and formed a solid windbreak. The original planners also recommended that the owners should thin their windbreak before the adverse effects of crowding ensued. Since thinning was practiced by only one of the windbreak owners included in this study, it was not surprising to find that all owners interviewed were dissatisfied with the close spacing of the original plantings. In the individual case where the owner did thin, the operation was performed too late to be of maximum benefit (see Fig. 2).

Many trees located in the inside rows are either suppressed or dead. This is especially true of conifers. Conifers in the inside rows of some windbreaks were able to keep their crowns even with or above the crowns of competing hardwoods. Conifers in this situation have bare trunks and a very short live crown as illustrated in Figure 1. Green ash and American elm are least affected by crowding when located too close to the next hardwood row. Excessive crowding has killed the lower branches of all trees and therefore reduced the windbreak effect.

Fig. 1. Row of white pine crowded out by the hardwoods on either side.

1/ Instructor, School of Forestry, University of Minnesota.

Published by the School of Forestry, University of Minnesota, St. Paul, Minnesota, cooperating with the Division of Forestry, Minnesota Conservation Department, and Forest Industries of Minnesota.
Thinnings: Although thinnings were recommended, only one of the 24 owners included in this study thinned his windbreak. In this case, two adjacent rows of green ash and silver maple were removed because they were crowding rows of pine on either side. (These trees were sawn into lumber and used in the construction of a granary.) The effect of crowding on red pine is shown in Figure 2. Several owners cut dead and wind-thrown trees for fuelwood; however, this study did not reveal a single owner who cut fence posts from his windbreak.

Reproduction: Boxelder reproduction was most prevalent followed by green ash, the former often invading other areas of the farmstead. American elm, silver maple, and caragana reproduction was rather scarce, and conifer seedlings were found in only one windbreak.

Shrubs for Snow Catch: The shrub rows of all the windbreaks included in the sample were either completely gone or had only a few scattered individuals remaining. Some were plowed under soon after planting in order to increase cropland acreage. In many instances the shrub rows were included in adjacent pasture where they suffered the effects of grazing.

General: It is estimated that half of the original 330 demonstration windbreaks are no longer in existence. Poor survival following planting, failure to replant, improper care of young plantings, and grazing are causes of windbreak failures. Twenty-five percent of the windbreaks studied were grazed by various forms of livestock. Some of these are virtual failures. Use by poultry is especially prevalent (see Figure 3). Considerable damage results from removal of the lower buds on conifers, exposing roots by scratching, and increasing surface runoff through packing of the soil. Soil compaction is usually quite serious and probably least suspected of poultry. Heavy concentrations of poultry droppings are also harmful to trees. Various weed species were common except in the better conifer windbreaks.

In general, all of these 40-year-old windbreaks have either reached their peak or are several years beyond their peak with respect to performing their primary function of reducing wind velocity. It is believed that this peak performance was reached prematurely because of the close spacing and lack of thinning.

Despite the lack of recommended thinning practices and improper use such as grazing, most of these windbreaks have adequately performed their functions of reducing wind velocity, protecting the farm buildings and feed lots, and have added beauty to the farmstead. Proper thinning practices, it is believed, would have extended maximum performance of these functions for many more years. These windbreaks have also provided a valuable source of information, through past studies, on which to base present and future recommendations.