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Planting Southern Appalachian White Pine In Wisconsin: The Pros and Cons

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INTRODUCTION

If you went back in time to the end of the nineteenth century, and you mentioned the word 'lumber' to a Wisconsinite of that period, he or she would probably just assume that you meant eastern white pine lumber.

Back then, the annual harvest of white pine was measured in billions of board feet. This was a time when trees which we consider valuable today, for example red oak and black walnut, were considered a nuisance because they interfered with the white pine harvest. Of course, a lot has changed

since then. Today, white pine is a much smaller component of Wisconsin's forests, and has a relatively small share of the lumber market.

However, it would be wrong to think the outlook for Wisconsin white pine is all bad. There are a number of reasons why we should be optimistic about white pine's future in the state.

First, foresters at the federal, state and county levels, have done an excellent job of regenerating and managing young stands of white pine.

White pine regenerates well in forest openings and on abandoned agricultural land. In parts of New England, it is sometimes called 'old field pine' because of its ability to colonize former farmland.

Second, compared to some species, white pine is

genetically quite diverse. This is an advantage for anyone interested in increasing yield or improving form. (Red pine, on the other hand, has limited genetic diversity).

And last but not least, white pine continues to be one of the most culturally important species in the state. This might be for its historical significance, for its aesthetic attributes, or its wood characteristics, but many people think of white pine as their favorite tree species.

DID YOU KNOW?

In 1892, Wisconsin produced well over 4 billion board feet of white pine lumber.

In 1995, Wisconsin's total lumber harvest (both hardwood and softwood) was approximately 1 billion board feet.

These were some of the reasons which prompted the USDA Forest Service to establish white pine trials across the eastern United States during the 1960's.

EARLY WHITE PINE TRIALS

Early trials indicated that white pine from the Southern Appalachian States (Georgia, North Carolina, Tennessee) tended to grow faster than local white pine in New England, the Middle Atlantic states, and parts of the Midwest.

WISCONSIN'S WHITE PINE PLANTINGS

After seeing the growth potential of southern Appalachian white pine, many states, including Wisconsin, established their own trials to look more closely at how the southern seed sources compared with local sources.

FAMILY in tree improvement jargon refers to a group of trees which have the same mother but different fathers. For examples, if you collect seed from underneath a lone white pine tree, these would be considered a family, because you know they all fell from the same tree, but you don't know which trees provided the pollen.

SEED SOURCE refers to a group of families from an area with roughly the same local growing conditions, for example soil type or climate.

In 1986, the Wisconsin DNR and the UW-Madison Dept. of Forestry established white pine plantings in 6 counties; Sawyer, Washburn, Chippewa, Wood, LaCrosse, and Richland. These sites were chosen for their north-south distribution, and their variation in growing conditions.

Each planting contained 30 white pine families, 28 from the Southern Appalachian region, and 2 from Wisconsin. The Southern Appalachian families had been chosen because they were 'above average' in their local environment. The Wisconsin families were selected at random from the State Forestry Nurseries.

After 11 years, we measured the plantings for height and diameter at breast height (DBH)

WHAT DID WE FIND?

As you might expect the plantings in the northern half of the state had noticeably slower growth rates than those in the south. This was true for both the local Wisconsin families and the Southern Appalachian families. Table 1 shows the variation in average family heights at each of the planting sites.

In southern Wisconsin, the Southern Appalachian seed sources generally grew faster than the local sources.

The performance of Southern Appalachian white pine in Wisconsin can best be illustrated by comparing growth at the northernmost (Sawyer Co.) and the southernmost (Richland Co.) sites.



Location of the 6 Southern Appalachian white pine trials in Wisconsin

Height growth at the Richland Co. planting was very impressive. The majority of families had individual trees which grew more than 25 ft. after 11 years. This was a result of the somewhat longer growing season in Richland Co. as well as the ideal nutrient and moisture conditions at this site (this planting is located on a fertile 'shelf' near the Wisconsin river).

At the Sawyer Co. planting site however, the Southern Appalachian sources did not perform very well. When we measured this planting (in the spring), we could distinguish the local sources from the southern sources at a glance.

While the Wisconsin white pine appeared healthy, many of the Southern Appalachian sources were stunted and had lost their needles. These trees produced a new set of needles each spring, grew normally during the summer, and then lost their needles during the winter.

At the other plantings, we noticed a similar, but less pronounced pattern. Figure 1 illustrates this well; the horizontal lines indicate the average height of the two Wisconsin families at each planting. The dots represent the average height of the 28 Southern Appalachian families.

At the plantings in the southern half of the state (on the left) the Southern Appalachian families grew at a similar or slightly faster rate than the local families. At the northern plantings (on the right), the Southern

Appalachian families grew at the same or slower rate than the local sources. At the Sawyer planting, none of the southern sources grew at the same rate as those from Wisconsin.

RECOMMENDATIONS

Clearly, there is little to be gained by planting Southern Appalachian white pine in the northern half of Wisconsin. Although many survive in this region, these sources are too slow growing to include in plantings.

- In Southern Wisconsin (especially the counties which border Illinois) Southern Appalachian white pine has the potential to grow faster and produce profits more quickly than local white pine.

BUT REMEMBER!

The Southern Appalachian seed sources have only been tested for a limited time

in Wisconsin. An extreme winter or a series of very early frosts could reduce their growth significantly

The Southern Appalachian seed sources were chosen because they were known to be fast growers, while the Wisconsin seed sources were just chosen at random. Intense selection of superior Wisconsin seed sources could produce white pine which grows as fast or faster than the Southern Appalachian seed sources AND which is much less susceptible to winter damage.

The WDNR/UW Tree Improvement program is currently making white pine selections in Wisconsin, and testing should begin in 1999.

Table 1. The average height (ft) of Wisconsin and Southern Appalachian white pine families at 6 Wisconsin plantings.

	Richland	LaCrosse	Wood	Chippewa	Washburn	Sawyer
Wisconsin	23.1	16.3	14.8	17.8	16.1	10.3
S. Appal.	23.3	17.6	15.2	16.1	14.8	7.6

Figure 1. The average 11-year height of 30 eastern white pine families (28 Southern Appalachian and 2 Wisconsin) at 6 locations in Wisconsin. The horizontal lines indicate the average height of Wisconsin families (# 0). Note the height scale differences at the Sawyer and Richland plantings.

