

## Walnuts and White Pine Can Be Grown Together Successfully

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*Small plantings of mixed eastern white pine (Pinus strobus L.) and black walnut (Juglans nigra L.) planted on the same site appear to be healthy after 15 to 18 years. These plantations are producing trees of desirable silvicultural form.* Tree Planters' Notes 37(2):29-31; 1986.

Many cultural problems await the novice landowner during the early years of walnut plantation establishment. Insect damage to leaders, epicormic sprouting, and girdling by meadow mice are a few examples. These problems may require annual corrective pruning or other cultural practices. Many landowners do not have the time, money, or patience for all this management.

The challenge presented to the forester is formidable. How do you establish a walnut plantation that will virtually take care of itself for 10 to 15 years? Usually, by then stem crowding is so apparent that even the most reluctant landowner will concede that an improvement cutting is in order. One answer to this challenge in southwest Wisconsin is the interplanting of white pine and walnut. Several plantations of this mixture were established 15 to 20 years ago, and the effectiveness of the combination is encouraging.

There has been concern about the dangers of growing white pine

and walnut together in plantations. Walnut trees produce the chemical juglone (5-hydroxy-1,4-naphthoquinone), which inhibits the growth of white pine. This growth inhibition seems to occur where white pine is planted beneath an established walnut overstory with the objective of bringing the white pine through to rotation age. But evidence from even-aged (15 to 20 years) plantations of mixed white pine and walnut appears to remove this concern (figures 1 and 2).

The planting design starts with the first row being planted to pure

3-0 white pine on a 6-foot spacing. The second row is planted to white pine alternated with 1-0 walnut on the same spacing. Rows are spaced 6 feet apart. These two basic rows are replicated over and over. When a plantation is completed, each walnut is surrounded by white pine. Approximately 300 walnut and 900 white pine are needed to cover an acre.

It is very important that the plantation be kept from grass competition during the first 2 years. This is best accomplished by applying a band of simazine to each row of



**Figure 1**—Fifteen-year-old mixed plantation of walnut and white pine in northwest Grant County, southwestern Wisconsin. Very little improvement has been accomplished.



**Figure 2**—Nineteen-year-old mixed plantation of walnut and white pine in northeast Rock County, southern Wisconsin. Three improvement cuts were made (1977, 1981, 1984), and the walnut crop trees were pruned to 12 feet.

the planting. Consult your local forester for the amount of chemical to apply. The rate of application will depend on the soil type and amount of grass competition or weeds present.

This white pine-walnut plantation prescription can be planted in many areas of southern Wisconsin, and on a wide range of sites. How-

ever, it works best on a well-drained, silt loam with a soil acidity between 6.0 and 7.0. Areas to avoid are river bottoms and valley floors where prolonged periods of high humidity in midsummer are common. These conditions may produce blister rust infection in the white pine as well as bacterial and fungal infections in the walnut.

In the early years of this prescription (ages 7 to 9) a modest thinning of white pine Christmas trees can be anticipated to help defray the cost of stand establishment. From ages 10 to 15, a genetic thinning is necessary. At this time, trees with better genetic traits will express their dominance; and additional growing space will favor future development of these trees. By age 15, the stocking of the stand should be reduced from 1,200 per acre to 700. Pruning should be done to half the height of the tree, whether walnut or white pine (figures 1 and 2).

The unusual aspect of mixing a conifer and a fine hardwood is that it gives landowners options that are not possible with pure plantings. Landowners may want to favor a walnut by cutting adjacent white pine. They can favor a fast-growing white pine by cutting deformed or poor-growing walnuts. It is entirely possible to bring white pine and walnut growing on the same site to final sawlog rotation.

A 60-year-old white pine plantation in Wyalusing State Park is living testimony to just how well walnut and white pine can grow together (figure 3). This 1923 planting of white pine now has dominants over 115 feet in height and a basal area of 220 square feet. As this planting developed, many walnut volunteers began to appear throughout the plantation. Today these walnut trees are saw-timber size, with 30 to 40 feet of clear

trunk. There is no apparent adverse effect from the walnut trees growing in close proximity to the white pine for 60 years.

The adaptations are limitless on the species mix of this prescription. For instance, for landowners who want to grow a desirable fuelwood species along with their walnut and white pine, it is possible to add green ash to the design. In this case, the design can be altered by substituting a green ash for every other walnut.

With high land prices and property taxes, foresters must be imaginative and innovative in their planting prescriptions. Every effort must be made to maximize returns for the landowner if we are to keep interest alive in forest management. Mixing of conifers and hardwoods is another option that foresters now have in assisting landowners to get the maximum return from a forestry investment.



**Figure 3**—Sixty-year-old plantation of white pine with volunteer walnut trees in Wyalusing State Park, southwest Wisconsin.