

11. Spacing, Timing, and Layout with Hardwood Trainers

John Kelsey 2023 Sept



Spacing:

Some people love a natural setting and hate to see trees planted in a grid. Our objective is to grow a crop. Did you ever see corn planted at random? There are several reasons to use a grid layout. Number one is the ability to get equipment in to control invasives. Number two is that I can walk straight to tree coordinate 23,116, and find it every time. If you want a park-like setting, go for it. That can be beautiful, but our heavily shaded plantings intentionally look like a bramble by design.

From the chapter 9's analysis, hardwood trainer species have been chosen. The selections should have dense foliage and match black walnut's vertical growth rate for the planting site. If there isn't clear winners, plant a mix and see how they grow. Then follow up replanting with the winners. It might cost a year or two to get started as planned.

Recent technical advice recommends a 9 x 9 foot grid. I like 3 feet wider than your brush hog. If you have a 6 foot brush hog, we are in complete agreement. Plant the black walnuts on 18 x 18 foot spacing. That is 3 trainers for every black walnut. That comes out to 134 black walnuts and 403 trainers per acre.

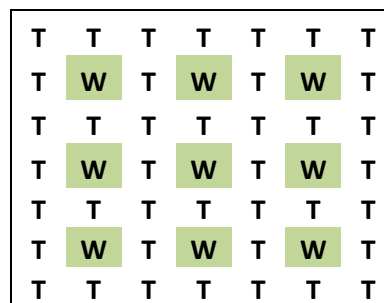


Figure 1. An initial layout of black walnuts surrounded by hardwood trainers

Figure 2. A grid of black walnuts planted in 1935

Timing:

When these trees are small they will grow like open-grown trees. Their major enemies are sod forming grasses and deer (see chapters 14 and 15). The trainer shading will not kick in for a few years, so some manual pruning would be useful. At least correct codominant leaders. When the walnuts get to 2 inch diameter, they will be 12 feet tall and the crowns will touch. At 2.5 inches, the canopy will be closed and your manual pruning work is done. I'm going by diameter here, not time. Canopy closure might be in 3 years on a very good site, or 6 years on a marginal site, but in either case, the diameters will be 2.5 inches.

With the canopy closed, serious natural training begins. Unfortunately some growth slowdown also begins. If the trees were in the open, their crowns would keep expanding, but here, they are stuck in a 9 x 9 grid, 81 square feet of canopy. How much space they want, divided by how much space they have, is called the Crown Competition Factor, CCF. At 2.5 inches diameter the CCF is 100%. At 4 inch diameter the trees are 25 feet tall, and they would like to have a much bigger crown, but they are stuck with 81 square feet, and the CCF is about 150%. Their growth is being slowed. It is time to give them some more room, so eliminate half the trainers.

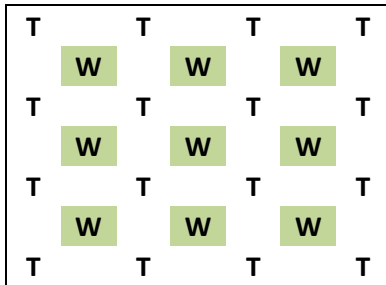


Figure 3. A second layout with half the trainers removed

With half the trainers removed, each walnut now has 162 square feet of canopy, and the CCF is dropped to 75%. Both the black walnuts and the trainers' crowns will expand to fill in the new canopy openings. The number of years it takes will again depend on the site, but the black walnut diameter will be about 5 inches, and the CCF is back up to 100%.when the canopy recloses. When the diameter reaches 6 inches trees are 35 feet tall with 25 feet of clear stem. The CCF is back up to 150%, and the growth rate is again slowed. It is again time to give the black walnuts some more canopy Space.

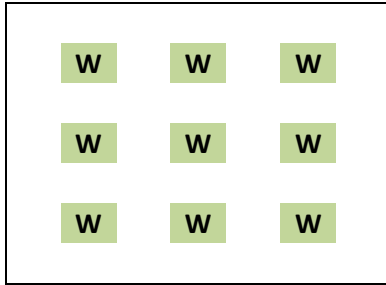


Figure 4. A third stage layout with all the trainers removed

Now the planting is a monoculture of 6 inch black walnuts in an 18 x 18 foot grid. The CCF is back down to 75%. The trees are 35 feet tall with 25 foot clear stems. Training time is over. The goal now is to pack the annual wood volume onto the best trees. There are 134 black walnut trees per acre. That is 4 times too many for the final density. From here forward, thinning will be gentler. We have used crowding to shape the black walnuts, but that phase is complete. Now we want full speed growth, of the very best crop trees. The details of further thinning are described in chapters 19, Selecting Corp Trees and 20, Pampering Crop Trees.

Comments:

This plan is about the same as would be advised by your local forester for a mixed hardwood planting. I am afraid it will not produce quite enough shade and somewhat suppress growth. I have tried to split the difference, and get a little bit of both. A bit of manual pruning may pay big dividends. The only hardwood training I've seen that worked well was a naturally seeded bottom with 1000s of stems per acre. The guys who are sold on this dense approach are Walnut Council members Bill Hammitt and Larry Krotz. The problem is supplying all the trees. Larry gathers every kind of seed he can find, spreads them on the field, and disks them in. I'm guessing their spacing is no more than 3 feet.