



# CENTRAL HARDWOOD NOTES

## Seeding And Planting Walnut

Aggressive black walnut plantation management will produce rapid growth, good form, and marketable products much faster than plantations allowed to grow without intensive culture.

### Selecting Sites

Site quality must be the first consideration in deciding whether to plant walnut. Professional help is essential for this. In general, soils should be at least 36 inches deep, well-drained, and have good moisture-holding capacity. Fertile loams and sandy loams with high organic matter and pH from 6.5 to 7.2 are usually best. Bottomland soils often meet these requirements, but avoid bottoms with excessive flooding, poor internal drainage, and bedrock or gravel deposits close to the surface. Ridgetops, south- and west-facing slopes, and swampy areas usually are poor walnut sites. Some level upland fields may be suitable walnut sites if the soil is deep and internal drainage is good. A mottled appearance (alternating spots of gray and brown or orange color) indicates poor internal drainage.

### Preparing the Site

This includes activities necessary to get the land ready to plant the trees. All perennial weeds, brush, or sprouts should be killed with herbicides the summer or fall before planting (table 1).

If soil pH is below 7.0, add lime before planting when it is most easily done. In general, if the pH is less than 6.0, apply 3 tons per acre; if 6.0 to 6.7 apply 2 tons per acre; and if 6.7 to 7.0 apply 1 ton per acre.

### Sources of Seedlings

Most state forestry organizations maintain nurseries to provide seedlings for reforestation. Order at least 10 to 20 percent more trees than you need. Sort and plant only the larger seedlings with healthy root systems. If you decide to grow your own seedlings or direct seed:

1. Gather seed from the best-formed and fastest growing trees in your area (see Note 2.02 Genetic Principles).
2. Remove husks.
3. Keep nuts cool and moist at all times.
4. Store in cold moist stratification for 3 months (moist nuts in plastic bags in cold storage or in a well drained, outdoor pit will do).
5. Plant nuts 1 to 2 inches deep in the spring.
6. If you are direct seeding in the permanent plantation, cover each spot with a 1-foot square of 1-inch mesh poultry netting to deter rodents. Stake the wire down and allow the seedling to grow through during the first growing season.

Table 1 .-Summary of black walnut management activities

Activity	Date	Rate of application	Comments
Liming	Fall- Winter	Maintain pH between 6.5 and 7.2. Requires 2 tons per acre once every 3 to 4 years.	Incorporate or apply before planting. Use pulverized agricultural limestone only.
Pruning	Feb.- April	Annually after trees are 2 years old. <sup>1</sup>	Maintain a central stem. Side branch pruning should begin when trees reach 6 to 8 feet tall.
Fertilizing	April	100 to 200 lbs. per acre of urea or 400 to 800 lbs per acre of 12-1 2-1 2 every other year, starting after age 3.	Broadcast over entire area just before rain or incorporate. Do not fertilize the growing season of outplanting.
Controlling weeds	March- April	Surflan 75W <sup>2</sup> at 2-2/3 to 5-1/3 lbs per treated acre.	Surflan kills germinating weed seeds so must be applied early. Will not harm walnut seedlings.
Controlling weeds	May-June	Roundup <sup>2</sup> at 2 quarts per acre in 25 gallons of water per treated acre.	Roundup must be directed so that it is not applied to young bark or green foliage. Leave weed or legume strips 4 to 6 feet wide between rows. Strips could be mowed occasionally. After trees are 20 feet tall, weed control can be discontinued or greatly reduced. Tall fescue and goldenrod should be eradicated from all plantings.

<sup>1</sup>Beineke, W.F. 1982. Corrective pruning of black walnut for timber form. FNR-76. West Lafayette, IN: Purdue University Cooperative Extension Service. 7 p.

<sup>2</sup>The use of trade names does not constitute endorsement of the products by the USDA Forest Service. Be sure to read and follow all directions when using herbicides.

7. After the leaves fall, remove the wire netting.
8. If planting nuts in a nursery bed, roll poultry netting over the planted seeds and remove wire in the fall. Seedlings should be transplanted to their permanent location the following spring.

## **Establishing Plantations**

**Planting Season.**-Plant bare-root walnut seedlings from March through early May, after danger of late freezes. You can direct seed either in the fall or spring; however, spring planting with stratified seed reduces the hazard of rodent pilferage.

**Layout and Spacing.**-Recommended spacing for walnut plantations varies from 12 x 12 feet (300 trees per acre) to 40 x 10 feet (108 trees per acre) depending on intercropping and thinning schedules. Rows must be perfectly straight in at least one direction to facilitate weed control and other cultural operations.

**Planting.**-Bare-root seedlings can be planted with a planting bar, auger, tree planting machine, or shovel. Walnut seedlings often require root pruning before planting. Prune long lateral roots that will not fit in the hole without curling or a taproot too long for the planting hole. Do not prune taproots to less than 8 inches.

Plant seedlings at the same depth or slightly deeper than they grew in the nursery. This spot can be recognized as a color change between the stem and root just above the swollen taproot. Keep seedlings cool and moist and out of direct sun when transporting, storing, and planting.

**Multicropping.**-Multicropping or "agroforestry" is planting two or more crops on the same site. Co-mingling species provides several advantages in walnut plantings. For example, crops of wheat, corn, hay, Christmas trees, or ornamental shrub crops provide income early in the life of the plantation. Black locust, autumn olive, vetch, and European alder add atmospheric nitrogen to the soil and trees and tall shrubs improve the form of the walnut bole through side-branch competition and early natural pruning.

## **Controlling Weeds**

Without weed control black walnut plantations invariably fail or grow too slowly. Three methods of weed control are available to most growers: herbicides, cultivation, and mulches.

Herbicides are safe, effective, and the most popular method of controlling weeds in walnut plantations (table 1).

Cultivating is an acceptable alternative to herbicides but will be needed several times during each growing season. Do not cultivate more deeply than 2 inches because many walnut feeder roots are in the upper soil layers. Also you must keep machinery from injuring the base of the trees.

Black plastic or organic mulches such as leaves, hay, straw, bark, chips, sawdust, may be used to control weeds. Generally, if you have more than a few trees, obtaining enough materials and applying it is not cost effective.

Mowing.-Mowing is not effective weed control and is mostly cosmetic. Weeds resprout using moisture and nutrients. In numerous plantations, mowing has done much more harm than good by causing serious tree wounds.

- Pruning
- Next to weed control, pruning is the most important cultural activity needed during the establishment period to improve the quality and future value of your black walnut plantation (table 1). For more complete information on the subject see Note 6.09 *Pruning Central Hardwoods*.
- Fertilizing
- Under no circumstances should seedlings be fertilized the year of planting. Most studies show that fertilizing walnut provides little growth improvement. On very good sites nutrient levels are probably adequate for optimum walnut growth, at least while the trees are young. Optimum nutrient levels for black walnut are unknown. The nutrient most often at low levels is nitrogen, and some additional nitrogen might be considered on some sites if optimum growth is desired (table 1).
- Problems
- Like all hardwoods, planted walnuts must be protected from domestic livestock. Deer browsing and rubbing are also a serious problem in walnut plantations. Small soap bars attached to trees and Ropel, a commercial repellent, have been reasonably effective deterrents.
- Most disease and insect problems in black walnut cause cosmetic damage and some growth loss but seldom kill trees. Walnut shoot moth larvae feed on expanding shoots, and various caterpillars feed on leaves. Ambrosia beetles with their companion fusarium fungus sometimes kill small trees to the ground but they usually resprout. Scale insects occasionally kill back the tops of trees. Unless defoliation occurs very early in the season, leaf diseases cause little damage. If you encounter serious pest problems you should contact local or regional experts.



The walnut caterpillar eats the leaves of the black walnut but seldom does serious harm  
(Philip Marshall)

#### References

- Beineke, W.F. 1982. Corrective pruning of black walnut for timber form. FNR-76.  
West Lafayette, IN: Purdue University Cooperative Extension Service. 7 p.
- U.S. Department of Agriculture, Forest Service. 1988. In: Burde, E. Lucy, ed.  
Walnut notes. St. Paul, MN: U.S. Department of Agriculture, Forest Service,  
North Central Forest Experiment Station. A set of individual notes with varied  
note numbers and page numbers.

Walter F. Beineke  
Department of Forestry and Natural Resources  
Purdue University  
West Lafayette, Indiana

James Jones  
Hammons Products Co.  
Stockton Missouri