

BLACK WALNUT

Cover Type Guidelines

ROTATION AGES

Harvest black walnut between 60 and 80 years of age. Consider tree size and quality, available markets, and 5 - 10 year growth projections in determining rotation ages for plantations as well as for individual natural trees found in other cover types.

HARVEST SYSTEMS

Single tree selection of commercially valuable trees is the recommended harvest method.

REGENERATION SYSTEMS

Planting of seedlings is the preferred regeneration method. Nut planting can also be used, but results often are erratic. Initial spacing of black walnut seedlings should be 10 x 10 feet or 10 x 12 feet. Interplant white pine or alder to help "train" the walnut and to help provide competitive control. Plantings of 2-3 rows of pine and one row of walnut have worked well.

Potential sites for establishing walnut plantations should be carefully screened. Select only the best sites for establishing walnut. Do not manage walnut if the current or projected site index is less than 40.

CULTURAL PRACTICES

Site preparation and weed control: Intensive competition reduction is required to produce high quality, fast growing walnut trees. Practice weed control for at least 3 years after establishment.

Pruning: Perform both lateral and corrective pruning. On stunted and malformed trees, coppicing should also be used. Begin lateral branch pruning as soon as the trees are 10 feet tall, limiting cuts to branches 2 inches or less in diameter. Prune 25 - 100 crop trees per acre, and limit pruning to trees less than 10 inches in diameter. The ultimate goal is to produce trees with 17 feet of clear bole. Because of the risk of canker diseases, do not prune between April 1 and November 1.

Thinning/release: Keeping the trees free of grass and overtopping woody competition is critical for maintaining good growth. Release individual crop tree so at least three-fourths of the crown of the released trees.... be at least 5 feet from the crowns of adjacent trees 60 to 100 percent as tall and at least 10 feet from the crown of taller trees" (Manager's Handbook for Black Walnut, Gen. Tech. Rep. NC-38.)

Thin to reduce crop tree competition and to recover more merchantable material. Base

thinning schedules on "crown competition factor" (ccf) as described in the above mentioned publication.

PEST CONSIDERATIONS

Black Walnut trees are affected by a number of insect and disease agents.

Foliage Pest

The most common foliage insect, the walnut caterpillar *Datana integerrima*, causes mid to late summer defoliation. Most often single colonies will defoliate an individual branch causing little impact. However, during outbreaks heavy defoliation may occur in closely spaced saplings and in individual large open-grown trees resulting in growth loss, twig dieback, and stunted seed crops. Heavy defoliation for more than two years may lead to mortality.

Another common late season defoliator is the fall webworm *Hyphantria cunea*. This insect forms webs while defoliating individual branches and is seldom serious.

Important leaf diseases include: walnut anthracnose, *Gnomia leptosyla*; *Mycosphaerella* leaf spot, *Mycosphaerella juglandis*; and *Cristulariella* leaf spot, *Cristulariella pyramidalis*.

Anthracnose is commonly found in all walnut age classes and site locations causing light defoliation in mid to late season in most years. In young slow growing upland plantations during wet years, defoliation can be complete by late summer further reducing growth.

Defoliation by *Mycosphaerella* and *Cristulariella* leaf spots occurs during mid to late summer in bottomland plantations in wet seasons. Heavy defoliation can result in growth loss. Outbreaks of *Mycosphaerella* leaf spot disease can persist in consecutive years making cultural control desirable in some plantation.

Bud and Shoot Pest

Annual terminal bud and shoot loss in young to pole size walnut is common in most years caused primarily by late spring frosts but includes the walnut shoot moth, *Acrobasis domotella*. This damage results in stem deformities that produce poorly formed trees in slow growing plantation.

Shoot dieback associated with *Phyllosticta* spp. causes pockets of mortality in young pole size plantations on bottomland sites. Conditions that favor disease development and control remain unknown.

Stem Canker

A perennial stem canker disease caused by *Fusarium sporotrichioides* causes a perennial stem canker which can lead to top kill. This disease is most common in bottom-land plantations. The disease enters the stem primarily through wounds made during the growing season.

Walnut Caterpillar

Monitor population defoliation for control needs.

Anthracnose Leaf Disease

In young upland walnut plantations, weed competition control can change the nutrient balance sufficient to eliminate defoliation by anthracnose.

Mycosphaerella Leaf Spot

Reduce disease inoculum by removing or destroying over wintering defoliated walnut foliage.

Terminal bud and shoot loss

Maintain maximum height growth in planted walnut for the first ten years. An average of 18" of height growth per year is necessary to outgrow the impact of annual stem deformities. Improve success selecting deep well drained soils on bottomland sites, or eliminate annual weed competition on upland sites and interplant to Eastern white pine. Corrective pruning for stem deformities is not recommended.

Shoot dieback disease

Report, monitor, and remove diseased trees from plantations.

Fusarium canker

Prune walnut only during the late dormant season, January 1 to April 1.

WILDLIFE CONSIDERATIONS

Walnut is normally associated with other hardwood species, and in this combination good plant species diversity provides wildlife benefits. Since walnut also produces food for nut-eating mammals, it is generally rated good overall for wildlife.

PREFERRED SITE CONDITIONS

Black walnut develops best on deep, well-drained, nearly neutral soils which are generally moist and fertile. This species is common on limestone soils and grows especially well on deep loams, loess soils, and fertile, well-drained alluvial deposits. (Manager's Handbook, Gen. Tech. Rep. NC-38.)