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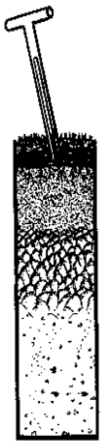

THE SOIL PROFILE

A newsletter providing information on issues relating to soils and plant nutrition in New Jersey

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Black Locust, A Valuable Tree Crop

Black Locust, *Robinia pseudoacacia*, is fast growing tree with many attributes that make it a valuable tree to grow as a crop. This species is well adapted to New Jersey. It is often found growing where soils were once disturbed. Locust wood is very hard, durable, and decay resistant. There is very little swelling or shrinkage with changes in moisture. These properties make locust wood a good alternative to treated lumber.

Wood used for outdoor structures and fenceposts are often treated with preservatives. The chemicals found in treated lumber may include mineral elements such as chromium, copper, and arsenic or toxic organic compounds associated with creosote. The chemicals found in treated lumber can leach out of the wood and contaminate the soil.

Besides concerns about contamination of soil, at the end of its useful life treated lumber creates a disposal problem. It may be considered hazardous waste, or it might otherwise get landfilled. In any case, wood chemically treated with preservatives creates environmental problems when there is a more sustainable solution. Black locust is an environmentally friendly alternative to using chemically treated lumber.

Economic Value

Demand is increasing for locust fence posts and lumber from black locust trees for several reasons. Certified organic farms are prohibited from using pressure treated lumber for fence posts or other structures that will be in contact with soil, feed, or animals. Because organic livestock production emphasizes pasture feeding, there is increasing need for perimeter fencing which typically utilizes locust fence posts. Different rules may apply for other uses of treated wood in other situations. Check with an organic certifying agent for specific details.

Other agricultural uses spurring demand for locust posts are trellises for wine grapes, garden stakes, and tall structures for growing hops. Besides agriculture, black locust lumber is becoming an increasing popular wood for domestic outdoor uses such as decking, patios, and playground furniture.

As already mentioned, black locust wood is very hard, durable, and decay resistant. Because the wood is so hard, predrilling holes for nails and screws is often necessary. Usually, the sapwood on black locust is relatively thin but less decay resistant. The heartwood is the most decay resistant. The heartwood of fence

posts in the ground will typically last for 30 years and often for more than 50 years.

When sawmilled or processed into 3x6 inch, a post 8 ft. long may sell for $15 to $18. Round unprocessed posts may sell for $6 to $12, depending on size and quality. Longer poles for trellises may be worth several times that amount. Lumber from black locust may retail for $3 to $6 per board foot. Logs unsuitable for posts or lumber make excellent firewood which when seasoned may retail at $200 per cord. (Values based on personal communications from several sources).

In addition to producing a highly durable decay resistant wood, black locust has other desirable characteristics as a crop. Black locust is a nitrogen fixing legume with nodules of nitrogen-fixing bacteria on its roots. This ability to capture nitrogen enables it to grow quickly on low fertility soils without added nitrogen fertilizer. Locust is capable of re-vegetating degraded soils and is used to reclaim strip mine sites and control soil erosion.

Another feature is that black locust trees flower in June. The flowers are very attractive to honeybees which produces a mild flavored good quality honey known as Locust Blossom Honey.

Suitable Soils and Culture

Strongly acid soils, very sandy soils, and poorly drained soils are not suitable sites for growing black locust. Black locust can be planted to help to remediate eroded soils, gullies, and steep roadside banks. Although it can be planted on poor soils with low soil organic matter content it will grow much faster on good soils. Well drained sandy loams, loams, and silt loams with soil pH levels between 6 and 7 are good sites. On good soils, black locust is a fast-growing tree that will produce usable fence posts in ten to twenty years.

New plantings can be established from seedlings purchased from a nursery or they may be propagated from collected seed or from dug up root suckers.

There is great potential for plant breeding to select, improve, and release new varieties of black locust. In Europe they have selected trees for desirable traits.

Shipmast is an example of a named variety that has been selected to grow fast and straight.

When black locust trees are harvested, they do not need to be replanted. They will very quickly regrow sprouts from the stump. After trees are harvested, they will grow back even faster from stump spouts to reach commercial size logs. Trees with 6 to 8-inch diameter log are of sufficient size to make a good post. Stumps should be cut low to the ground. The multiple sprouts that are likely to emerge from each stump should be pruned to allow only a single stem to grow into a new tree. New trees from stump sprouts may regrow 4 to 8 ft in the first year after being cut. Logs should be harvested in the fall or winter months. Spring or summer time harvests are not optimum for tree regrowth.

Silvopasture

Some livestock farms practice what is called silvopasture – the integration of forestry with grazing of pasture grasses. Black locust is well suited for silvopasture systems since this species casts a light shade which allows pastures grasses to grow well. At the same time the black locust plantation provides shade and shelter for livestock. Black locust in silvopasture also provides nitrogen to enhance pasture grass growth.

In a silvopasture system, when trees are young, they must be protected from livestock with some type of fencing.

Although ruminates can safely consume locust foliage, the tree is regarded as toxic to equine. If the trees are pruned to remove side branches this produces a clearer trunk with fewer knots in the wood. Pruned branches with leaves intact may be fed to cattle, goats, or sheep but not horses.

Horses cannot tolerate the bark from black locust. Thus, when the posts are used for horse pasture, the bark must be removed.

Pest Management

Locust trees tend to grow straight trunks. However, sometimes locust is attacked by an insect known as the locust borer which damages the stem.

Damaged trees typically recover but they are more likely to grow crooked. These trees might not be suitable for lumber. However, regardless of tree shape locust makes excellent firewood. The wood is very dense and burns well when properly seasoned to make a hot fire.

The locust borer insect prefers to lay its eggs on tree trunks with exposure to sunlight. Cultural practices to shade the trunks is believed to reduce the amount of injury from locust borer. Close space plantings or integration with other forest tree species are strategies for producing more shade on the tree trunks. Delaying pruning of side branches also helps to keep the trunks shaded. At some sites honeysuckle vines may climb on tree trunks and provide shade protection.

In late summer, leaf miners may attack the foliage. In severe infestations, the foliage may turn brown but there is no practical way to control this pest.

One of the most serious pests of black locust, or most any young tree planted in New Jersey, is attacks from deer. Young trees have small thorns, but this is not enough protection from grazing. During the spring, deer especially like to graze on the young fresh shoots of black locust. This greatly sets back upright growth

and repeated grazing can kill trees. In the fall, male deer rub on young trees and injure the bark. Some type of deer fencing, or regular sprays of deer repellent are necessary to prevent deer damage at sites with high deer populations.

Locust Plantation at Rutgers, New Jersey Agriculture Experiment Station

In 2010, a field of brush was cleared from an overgrown abandoned quarter acre field at Rutgers, NJAES Horticulture Farm-3 (67 Ryders Lane, East Brunswick, NJ). The soil at this site is a Sassafras sandy gravely loam. Soil pH was 4.6.

In spring of 2011, two-year seedling trees, 1 - 2 ft were purchased from Musser Forest Nursery, Indiana, PA. They were planted in rows spaced 8 ft apart and spaced 8 ft within the row. This creates a square grid pattern for a population of 680 trees per acre. This spacing allows for easy passage of tractor with mower for weed management. A relatively close spacing is considered desirable for purposes of promoting upright straight growth and shading of tree trunks to minimize borer injury.

After transplanting, agricultural limestone was applied in a 4 ft sq area around half of the trees. The other half were left untreated. In 2012, tree survival was evaluated one year after transplanting. Out of 100 trees planted there was a good survival rate of 95%. Three years after transplanting, tree diameter at breast height averaged 1.55-inch. Trees treated with limestone averaged 1.6-inch dia. And untreated trees averaged 1.5-inch. dia.

Observations Ten Years After Establishment

The initial survival rate in the year after transplanting seedling trees was about 95%. In subsequent years, some trees within the stand died, as might be expected from overcrowding.

Trees on the outside edge of the grove where they have the least competition, have grown to a diameter of about 6 in. at breast height.

Liming strongly acid soils may improve growth rate.

Spacing trees 8 x 8 ft. is too close for optimal growth, but it may help to protect trunks from borer attack.

Trees growing poorly, crooked, or injured may be thinned and used for firewood.

An estimated 60% of the trees that were transplanted might be expected to produce good straight posts within 15 to 20 years after the plantation establishment.

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