

Black Locust Plantations in the Piedmont Region of Alabama



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A very good 12-year-old black locust plantation in the Piedmont Region is shown on the cover page. The site is a small colluvial area which has a deep loam topsoil and which is well supplied with moisture.

Below is a poor black locust plantation in the same region. The site, however, is a dry old field on an upper slope. The topsoil is a thin clay loam. This is typical of sites where black locust should not be planted.



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BLACK LOCUST, *Robinia pseudoacacia*, was at one time generally considered as one of the best adapted of all species of trees for planting on eroded hillsides and gullied lands. In reference to the black locust Mattoon (1) wrote, "Its strong spreading root system and rapid development give it first place among all trees in ability to check erosion in gullies and on steep hillsides." He further indicated that the locust was generally recommended for planting from the New England States south to Georgia and west to Texas, Missouri, and Illinois.

Meginnis (2), in describing the black locust, stated, "It is not only particularly well adapted for growth on most eroded sites and exposed clay subsoils much too poor for agricultural use, but, like most legumes, it also builds up the soil by contributing nitrogen." Tillotson (5) in discussing this species for forest plantings in the eastern United States, said, "It grows on poor, sandy, gravelly, or clay soils." As a result of the recommendations of Mattoon (1), Meginnis (2), Tillotson (5), and others as Turner (6), and Rehder (4), black locust seedlings were produced in quantity by the Soil Conservation Service, Forest Service, Tennessee Valley Authority, and state nurseries.

LATER RECOMMENDATIONS

Between 1927 and 1934 the Alabama Agricultural Experiment Station made a series of 10 black locust plantings. Ware (7), in describing survival and growth of these black locust plantations in Alabama, reported, "These plantings have definitely shown that the locust in Alabama does not behave according to the generally accepted opinions

expressed in literature and commonly held by people in other sections." He stated that, among other things, the Alabama Experiment Station's plantings indicated:

- (1) That the black locust planted in gullies, on eroded hillsides or on old fields will fail where the land has not been prepared and where the plants have received no attention.
- (2) That the locust planted on old fields of low or fair fertility will make very rapid growth where the land has been prepared, where three cultivations have been given, and where a complete fertilizer has been added.
- (3) That the cost of establishing the locust satisfactorily makes this species too costly to use in large scale reforestation programs or for large scale plantings on abandoned agricultural land.

Minckler and Chapman (3), in recommendations for planting in the Virginia-Carolina Piedmont Region, reported, "In the Piedmont, black locust may be planted for erosion control in deep gully bottoms and around check dams where there is plentiful moisture and an accumulation of soil and debris. Pine is usually more successful, even for erosion control. Locust can be grown on suitable sites to a limited extent for posts. It does not grow well on very acid soils." They also reported that only very small areas of the Piedmont are suitable for this species and that it will not grow on abandoned old field, upland sites.

OBSERVATIONS OF PLANTATIONS IN THE PIEDMONT REGION OF ALABAMA

As a result of early recommendations, many black locust plantings were made in the Piedmont Region of Alabama. The majority of these plantings were established by the Soil Conservation Service, using CCC labor, and included plantings for both erosion control and fence post production or a combination of the two.

During the spring and summer of 1948, field observations were made for the Piedmont Region as a part of a state-wide plantation study by the Alabama Agricultural Experiment Station. Only the black locust plantations made for fence post or combination of fence posts and erosion control were studied, since most of the gully plantings were made up of scattered small groups of trees. On approximately 125 plantations, general observations were made concerning site condition, growth, size, disease, insects, and general condition of the trees. Records were made on 27 plantations which represented a

range from poor to good stands. Several plots were established and the trees were measured to obtain growth and yields.

DESTRUCTIVE AGENCIES

Locust borers, leaf beetles, fire, cattle, and undergrowth were the most injurious to black locust in the Piedmont. Many of the plantations have already been destroyed or are gradually passing out of existence because of these factors.

The locust borer, *Cyllene robiniae*, is probably the most destructive agent. One tree may be attacked over and over again by this insect, since it attacks both injured and healthy stems. Consequently, many trees are killed annually.

The larvae of the leaf beetles are leaf miners. The beetles, *Chalepus dorsalis*, and others known to attack black locust, attack the locust summer after summer. Partial, and in many cases almost complete, defoliation causes the trees to make a much slower growth than normal.

Fire and grazing are especially damaging to black locust. The characteristic thin and ridge type bark makes the species susceptible to any type of fire, even of the lightest intensity. Cattle feeding on green leaves of seedlings and saplings cause breakage of the limbs and trunk.

The black locust is one of the most intolerant of the hardwood species and can not withstand competition with heavy growth of underbrush and vines. Honeysuckle vine will choke out the seedlings and saplings. Loblolly pines, established at the time of planting the locusts or shortly thereafter, outgrew and shaded the locust. Many plantations in the Piedmont are gradually passing out of existence because of the competition of pine and hardwood reproduction and undergrowth of shrubs and vines.

EFFECTS OF SITE

The best growth of black locust in the Alabama Piedmont Region was found on moist, well drained sites where the topsoil was 10 to 12 inches deep and both the topsoil and subsoil were loose and friable. Such sites occur mainly in colluvial areas and in small bottom lands. Good growth was observed on small colluvial areas on lower and middle slopes, when these areas were well supplied with water. Practically all plantings on old abandoned fields with eroded top soil and compact subsoil were failures.

Quality of the site appears to have a very definite influence on the amount of damage caused by the locust borers and leaf beetles. Some such damage can normally be expected on any site, but this damage was much more pronounced on the poorer sites and in plantations receiving no care, such as protection and cleanings. On the better sites, the effect of insect damage was negligible.

DISCUSSION

Most of the lands on which black locust plantations were established were prepared by plowing and fertilizing. Also, many of the plantations were cultivated during the first and second year after planting. Ware (7) stated that such treatment was very beneficial. Even this treatment did not cause black locust to survive and grow on sites to which it was not suited. Other than cultivation for the first and second years, the majority of the plantations received very little management after they were planted. The growth of plantations of the same age was variable because of differences in soil moisture, fertility of sites, and degree of protection and management. On the better sites, the trees attained fence post size in 8 to 10 years.

SUMMARY

The majority of the black locust plantations, which were established in the Piedmont Region of Alabama during the 1930's for fence post production, were unsuccessful because they were not put on proper sites and did not receive proper care from the land owners. Good growth of black locust can be expected only on moist, well drained sites where the topsoil is deep, and both the topsoil and subsoil are loose and friable. Black locust is not a suitable plant for preventing or checking soil erosion or for reclaiming old abandoned fields of eroded topsoil and compact subsoil.

Farm owners should be able to successfully produce black locust trees for fence posts by following these recommendations.

1. Plant the seedlings on moist, well-drained sites where the topsoil is at least 10 to 12 inches deep and both the topsoil and subsoil are loose and friable.
2. Break the land prior to planting.
3. Cultivate the plantations for the first and second years after planting.
4. Protect the plantations from fire.
5. Do not allow grazing until the trees attain sapling size.
6. Clean out periodically undergrowth and competing tree species.

L I T E R A T U R E

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