TREE SPECIES FOR PLANTING SPOIL BANKS IN NORTH ALABAMA

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While probably not more than 12, 000 acres have been strip-mined for coal in Alabama, the owners of many of these lands recognize an economic and a moral obligation to reclaim them. One of the most likely ways of restoring the spoil banks to production is to plant forest trees on them.

Narrow banks that are near an abundant source of tree seed will seed in naturally over a period of ten to fifteen years. Larger banks (50 yards or more wide and over 150 yards long) will require more time, and even then may not have enough trees for profitable timber management. Tree planting will reduce the time required to put these lands back into production, and will more nearly insure complete stocking.

To determine species suitable for planting on Alabama spoil banks, a study was established in the spring of 1946. It was begun by the Central States Forest Experiment Station of the U. S. Forest Service, and has been carried. on by the Birmingham Branch of the Southern Forest Experiment Station.

The Experiments

The planting experiments are in Walker county, on lands operated by the Marigold Mining Company. These lands are east of state highway number 5, approximately 9 miles north of Jasper. The coal seams of this area are of the Pottsville formation, laid down in the Carboniferous period. In the undisturbed overburden the top two to four feet is usually a fine sandy loam or silt loam; below this is a layer of stratified silt, silty clay, brown shale, or fine sand up to 10 feet thick; directly over the coal seam is a layer of gray shale averaging 12 feet thick. Sometimes sandstone occurs with the shale. The pH of the topsoil ranges from 4. 5 to 5.0; the shale has a pH range c£ 6.5 to 8.0. The spoil banks created from this overburden are approximately 50 to 70 percent soil material; the remainder is thin-bedded, medium-hard, gray shale.

The banks on which this study was made ranged from 1 to 1-1/2 years old. Longleaf, shortleaf, and loblolly pines and white ash were planted on representative portions of them. A small test was also made of the effect of fertilizing planted loblolly pine and white ash seedlings. The fertilizer was composed of 20 grams of cottonseed meal and 20 grams of ground tobacco stems and was placed in the hole in which each seedling was planted. Along the margins of permanently flooded troughs created by the strip mining, tupelo gum, white ash, green ash, and sycamore seedlings were tested. In all, about 5 acres were planted. The trees were spaced 6 feet apart each way.

In addition to these tests, direct seeding of the three pine species was tried on 2.3 acres more.

Results

Results after five growing seasons are summarized in tables 1, 2, and 3. Direct seeding was a complete failure, so no data are shown for this part of the experiment. As, the tables indicate, sycamore and loblolly pine seem to hold the most promise for the afforestation of spoil banks in north Alabama.

Sycamore should be planted on the moist margins of the flooded excavations. On such sites, sycamore reached a height of 10 feet in 5 years and had excellent surviv4l--93 percent. Sweetgum was not included in this study, but observations of natural seedlings indicate that it might do very well on damp sites. Several sweetgums that had seeded in naturally reached heights of 12 feet or more.

Table 1.--Pine and ash planted on ordinary spoil banks

Species	5-year height	Survival
	Feet	Percent
Loblolly pine	8.2	86
Shortleaf pine	5.4	71
Longleaf pine	3.6	23
White ash	4.8	49

Table 2. --Pine and ash, fertilized and unfertilized

Species and treatment	5-year height	Survival
	Feet	Percent
Loblolly pine		
Fertilized	9.0	78
Not fertilized	8.0	81
White ash		
Fertilized	3.6	75
Not fertilized	3.3	50

Table 3. --Hardwoods planted near standing water

Species	5-year height	Survival
	Feet	Percent
Sycamore	10.1	93
Tupelo gum	3.8	75
White ash	4.0	(1/)
Green ash	5.2	(1/)

1/ No estimate.

Loblolly pine should be planted on all the spoil bank sites except the moist ones. Unfertilized seedlings reached eight feet in height in five years and had better than 80 percent survival. Fertilization increased the height a little, but did not appear to improve survival. Judged by the results of this test, the gain from fertilizing is too slight to justify the trouble and expense involved.

While the survival and growth of shortleaf pine was satisfactory, the high incidence of littleleaf disease makes shortleaf a poor risk for any type of planting in north Alabama.

The poor showing of longleaf pine probably arises from the fact that it usually takes three or more years before longleaf seedlings begin to make height growth. The seedlings are therefore easily covered over by the shifting and washing of soil that takes place for at least two or three years after the creation of the spoil banks. This lack of soil stability probably contributed to the failure of the direct seeding of pines.

On the basis of these experiments, neither tupelo gum nor the two ashes° (white and green) can be recommended. Fertilization appears to have benefited both the growth and survival of white ash, but the trees have such poor form that it is doubtful that they will ever be able to produce anything but fuel wood.