

LEGUMES FAIL TO BENEFIT LOBLOLLY PINE PLANTINGS IN NORTH MISSISSIPPI

D. C. McClurkin
Southern Forest Experiment Station, U. S. Forest Service
Oxford, Miss.

Three herbaceous legume species were planted with loblolly pine seedlings in an attempt to improve survival and growth of pine on gullied or severely sheet-eroded land in north Mississippi. It was reasoned that the legumes might protect the site until the pine seedlings became large enough to take over, and also might protect the pine from tip moths by acting as a mechanical barrier for the first year or two.

Method

Plantings were in two blocks, one on Brown Loam and one on Coastal Plain soil. The Brown Loam block was a former house site, badly sheet-eroded but not gullied, and occupied by a plum thicket.

The Coastal Plain site was deep, excessively drained sand on which grew a few scrub oaks and an occasional pine. It too was badly sheet-eroded but had no gullies.

Each block was divided into eight plots of 36 by 42 feet, so as to provide for four treatments with two replications per block. In the early spring of 1955, both blocks were disked and planted with 1-0 loblolly pine seedlings at a 6-by 6-foot spacing. Three species of legumes, each of different height, were assigned to each block at random and interplanted with the pine. Treatments were as follows:

1. Lespedeza bicolor (tall) planted as seedlings at 3- by 6-foot spacing.
2. Lespedeza sericea (medium) broadcast at the rate of 33 pounds of seed per acre.
3. Trifolium incarnatum (short), crimson clover, broadcast at the rate of 15 pounds of seed per acre.
4. Control--no legumes.

Legume seeds were treated with commercial bacterial inoculum prior to sowing. All plots were fertilized with 5-10-5 broadcast at the rate of 400 pounds per acre.

Plots were examined at the end of the first, third, and fifth growing season to determine pine seedling survival, height growth, and insect damage.

Results

Survival and height growth of the pines were not improved by the interplanted legumes (table 1). In fact, the trees fared slightly better on untreated plots, though differences were not statistically significant.

On the Brown Loam block both the L. bicolor and L. sericea did well. T. incarnatum made a good start but soon lost out to weeds.

TABLE 1.--Fifth-year survival and height-growth data for loblolly pine seedlings

Interplanted legumes	Survival		Height growth	
	Brown Loam	Coastal Plain	Brown Loam	Coastal Plain
	<i>Percent</i>	<i>Percent</i>	<i>Feet</i>	<i>Feet</i>
Bicolor.....	50	45	14.3	7.4
Sericea.....	78	12	6.3	7.0
Clover.....	80	2	10.8	10.2
No legumes.....	82	45	12.2	8.8

On the Coastal Plain block L. bicolor did well initially, but after five growing seasons both it and L. sericea were sparse. T. incarnatum never made a showing.

The pines constantly outgrew the legumes and so remained continually exposed to tip moth. In 1959 less than 2 percent of the surviving seedlings were free of infestation.