

FERTILIZING STRIP-MINE PLANTINGS BENEFITS SOME HARDWOODS

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Introduction

After 2 years, American sycamore, European alder, and yellow-poplar seedlings that

were fertilized when planted on an Ohio strip mine had grown significantly taller than non-fertilized seedlings. However, fertilization significantly reduced yellow-poplar survival. Seven other species in the planting benefited less or were hindered less by fertilization.

New spoil banks usually contain little natural soil, and many lack sufficient amounts of one

¹Respectively, Research Forester, U.S. Forest Service, Central States Forest Experiment Station, Athens, Ohio, field office, maintained in cooperation with Ohio University; and Forester, Ohio Power Company, McConnsville, Ohio.

or more plant nutrients. However, if the spoil is loosely graded, it provides a good medium for root growth, and promotes satisfactory soil-moisture relations. On such sites fertilization of hardwood plantations should be more effective than in old-field or forest plantings where fertilization is commonly of little value.

Procedure

Experimental plantings were made on Ohio Power Company strip-mined land in Morgan

Results

TABLE 1.--Survival and average height of trees 2 years after planting

Species	Survival		Height	
	Fertilized	Not fertilized	Fertilized	Not fertilized
	<i>Percent</i>	<i>Percent</i>	<i>Inches</i>	<i>Inches</i>
American sycamore, <i>Platanus occidentalis</i> L.	88	88	26.1**	17.5
European alder, <i>Alnus glutinosa</i> (L.) Gaertn.....	84	100	23.9*	16.8
Yellow-poplar, <i>Liriodendron tulipifera</i> L...	36*	68	17.3*	11.8
Northern red oak, <i>Quercus rubra</i> L.....	24	36	10.3*	7.0
White ash, <i>Fraxinus americana</i> L.....	64*	84	8.4	8.7
Black walnut (seed), <i>Juglans nigra</i> L.....	32	36	4.7	5.9
White oak, <i>Quercus alba</i> L.....	8	12	6.2	5.5
Eastern white pine, <i>Pinus strobus</i> L.....	24**	64	7.8	6.9
Red pine, <i>P. resinosa</i> Ait.....	8	8	9.5	7.0
Shortleaf pine, <i>P. echinata</i> Mill.....	4	8	11.5	13.2

*Moderately statistically significant.

**Highly significant.

Fertilization doubled the mortality of yellowpoplar and more than doubled that of white ash. The 64-percent survival of the treated ash trees would still be considered adequate, but the 36-percent survival of the yellowpoplar would not. Survival of white pine-the only one of the three pines which had even a nearly adequate survival--was also reduced by fertilization.

Total height of fertilized trees was significantly greater than that of check trees for American sycamore, European alder, yellowpoplar, and northern red oak. The additional growth of at least the first three species seemed to make fertilization practical. None

County, Ohio. In 1961 Sewickley (Meigs Creek Number 9) coal was mined from the area; the spoil was graded the following winter. The spoil pH is 5 to 7, and the soil texture is a rather loose, shaly clay.

Ten plots were planted; each contained 50 trees of a single species at 7- by 7-foot spacing.

A 1/3-ounce fertilizer pellet² was dropped into half the planting holes (chosen at random). After two growing seasons, survival and average height of the fertilized and unfertilized seedlings were compared (table 1).

of the other species showed significant height increases or decreases.

Conclusions

The pellet method of fertilization is easy and relatively inexpensive--the pellets cost 1 to 2 cents each, depending on the quantity bought.

Results will probably differ in other areas and other years, so these findings should be followed with caution until additional trials have been made. However, strip-mine planters who need or want rapid early growth of hardwood plantations might well consider fertilization.

²The fertilizer pellets used contained 28 percent nitrogen and 5 percent phosphorus as P₂O₅.