

OHIO AGRICULTURAL EXPERIMENT STATION
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Hardwoods Show Promise for Spoil Bank Reclamation

by

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Coal mining in Ohio today is near an all-time high. With the increased tonnage of coal removed in the last decade an even greater proportion of this coal is being removed by surface mining methods. Coal production records of 1955 showed that 66% was mined by stripping, as opposed to only 41% a decade before. Recent trends indicate an even greater swing to surface mining.

Over the past few years strip-mining has affected between 9 and 10 thousand acres annually. Of this area, approximately one-half is being planted to forest tree species. About 5% of the affected lands are being used as roads, ponds, etc., or are considered unplantable because of adverse site conditions. The remaining areas are seeded to forage crops. The spoils chosen for trees are usually of an acid nature and are unsuited to forage species. This report deals with a few hardwood species planted experimentally on spoil banks by the Ohio Agricultural Experiment Station.

Plantations Established

In the spring of 1952 four tree species were selected and planted on a variety of sites (see table). These species include: McKee hybrid poplar, Chinese chestnut, silver maple, and red elm. Hybrid poplar had been tried experimentally the year before and had shown promise of being tolerant to spoil conditions. It was decided to further test the effects of applications of lime, fertilizer, and sawdust mulch on establishment of hybrid poplar as well as the



effects of rooted, unrooted, or boxed cuttings on overall success of the planting. Various combinations of the above factors were tried. Chinese chestnut was planted in small boxes of soil. Silver maple and red elm were planted with a planting bar except on Area 4 where the maple was planted in boxes of soil.

Five-year Evaluation

After five growing seasons on the spoil banks survival and total height measurements were obtained. Total height was recorded to the nearest 1/10-foot. Analyses of the data failed to show any real difference due to planting method for hybrid poplar. Except for Area 1, growth and survival of poplar was excellent. Acid spoils such as Area 2, 3, and 4 appear to meet the site requirements of this species. This species compares favorably with black locust in growth and site stabilizing abilities. Its growth is far above other hardwoods of pulp or timber value. This species tends to be straight and tall which would lend itself well to future forest management.

Of the other species tested in this experiment, silver maple appears to be the best, comparing favorably with sweetgum, sycamore, chestnut oak, and white ash. Red elm seems to have some merit on acid spoils, however, additional tests will be required to establish further proof of its value. Both silver maple and red elm will make satisfactory chipping material, as well as pulpwood for these expanding markets.

Chinese chestnut has had only mediocre survival. Growth of this species is quite variable with the best growth and color occurring in the immediate vicinity of black locust. Although not considered as a timber tree, this species does provide edible nuts and may be of value for this reason alone. A few edible nuts were harvested from these trees during the fall of 1956.

Additional tree species are being tested each year by the Ohio Agricultural Experiment Station. Results will be reported as they become available.

Table I
 Summary of Five-Year Growth and
 Survival of Forest Trees on
 Strip-mines in Ohio
 (1952 planting)

No.	Area Description		Spoil Texture	Hybrid Poplar		Chinese Chestnut		Silver Maple		Red Elm	
	County	pH		Surv. %	Tot. Ht. Ft.	Surv. %	Tot. Ht. Ft.	Surv. %	Tot. Ht. Ft.	Surv. %	Tot. Ht. Ft.
1	Gallia	2-4	Sandy Loam	7.1	0.74	*					
2	Coshocton	4-5	Silty Clay Loam	83.5	6.06	42.9	2.71	88.5	3.16	57.1	1.70
3	Holmes	4.5-5.5	Silty Clay Loam	73.9	6.23	52.0	1.93	91.7	3.87	68.8	3.00
4	Perry	4-5	Loam	100.0	8.02	92.9	1.53	85.7	2.33		

*Blanks indicate species not tested on this area.