

REFORESTATION OF SURFACE MINES ON LANDS OF
VICC LAND COMPANY

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Thomas F. Evans, Forester, VICC Land Company, P. O. Drawer C, Coeburn, Va. 24230

Abstract.--This Virginia coal company's surface mined lands show an adequate stocking of tree seedlings in terms of number per acre, but the distribution of seedlings has been affected by past reclamation practices. Natural re-seeding has been an important contributor to the present seedling stock.

INTRODUCTION

VICC Land Company, or VICC as referred to herein, is one of the largest landowning companies in southwest Virginia, owning more than 24,000 acres in fee, and coal and other mineral rights on an additional 50,000 or more acres. Approximately 8,000 acres of fee property and 75,000 acres of mineral lands are also owned in southeast Kentucky. The company has mined its coal reserves for nearly a century, primarily by deep mining until relatively recently. Surface mining was initiated on VICC property in the 1940's and during the 1970's was the primary means of mining. The peak of surface mining activity on VICC lands was reached during the coal boom of 1974-75.

Until the passage of the Federal Surface Mining Act of 1977, coal was surface mined on VICC lands by removing the overburden from the coal and placing it over the hill, creating a relatively flat bench on the hillsides, and outcrops ranging in length from a few feet to several hundred feet, depending on the degree of slope.

Prior to 1966, little reclamation was done to the surface mines except that a few hundred acres were planted with pine seedlings. While these pines did a lot of good on the areas where planted, most of the mined lands were left to become vegetated by native grasses, shrubs and trees.

The State of Virginia passed its first surface mining reclamation law in 1966, requiring the operators to level the bench areas, sow perennial grass mixtures, plant three rows of white pines on the outer edge of the bench, and plant black locusts on all

the outcrops. Basically, these requirements existed in Virginia until the advent of the federal law.

In the past, VICC timber resources suffered due to the surface mining activities and the lack of a company timber management policy. The company relied on local timber cutters to salvage as much timber ahead of mining as possible, but there was little attention paid to postmining uses of the land except to meet the requirements of the reclamation laws. Only in 1977 did the company employ its first forester to initiate a timber management plan.

An essential element of the VICC timber management plan is a permanent plot inventory of the timber resources, which is still in progress. This inventory will set the limits on yearly timber harvests and will define the areas on which timber management activities should take place. Through periodic remeasurements, the permanent plots will yield valuable information on timber growth and forest stand changes.

Since the trees on surface mined lands are expected to add substantially to future allowable timber harvests, a random sample inventory of the tree seedlings present on these mined lands has been made a part of the timber inventory.

The Seedling Inventory

The tree seedling inventory was begun by delineating all surface mined lands on VICC's Virginia property on U.S.G.S. 1"=2000' scale topographic maps. The acreage in all these surface mined areas was estimated by

dot grid tally. Plot locations were chosen by randomly selecting a starting point on a mine, then taking a one-five-hundredth acre circular plot every one-tenth mile along the mine. Because of the variability in conditions along these mines, plot sites were divided into the categories of inner bench, middle bench, outer bench, upper outslope, middle outslope and lower outslope. The placement of the plot center was determined by randomly drawing a card specifying one of the six locations, then pacing to the proper spot.

A total of 752 trees and tree seedlings was tallied on 215 sample plots, for an average of 3.5 trees per plot or 1,750 trees per acre. An estimated 5,400 acres have been affected by surface mining activities on VICC property in Virginia.

Table 1 gives the number of seedlings inventoried on VICC surface mines by position on the mine (see Table 1 below). This table shows the difference in number of seedlings present on the areas which have been planted compared to the inner and middle bench areas which were not. However, few areas were found on any part of the surface mines which did not have an adequate stocking of tree seedlings unless there was a heavy stand of *sericea lespedeza*, common on many inner and middle bench areas.

Table 1.--VICC Surface Mine Tree Seedling Inventory
Number of Trees By Position On Mine

	Position on Surface Mine					
	Inner Bench	Middle Bench	Outer Bench	Upper Outslope	Middle Outslope	Lower Outslope
Number of Plots	29	38	38	36	41	33
Number of Trees Tallied	60	83	160	144	154	151
Trees Per Plot	2.07	2.18	4.21	4.00	3.76	4.58
Trees Per Acre	1,035	1,090	2,105	2,000	1,880	2,290

The distribution of tree species on VICC's surface mined lands is shown in Table 2 (see Table 2 below). Virtually all of the pine and most of the black locust seedlings tallied were established by planting, although some black locust originated from seed frequently included in the grass seed mixture. No known planting of hardwood seedlings other than black locust has taken place on VICC property. Only an estimated twenty-nine percent of the total number of seedlings tallied were the result of planting or direct seeding. However, on the average, the planted trees have achieved a much larger size over the period since mining, since more time is required for natural seeding to take place.

Table 2.--VICC Surface Mine Tree Seedling Inventory
Species Distribution

Species	Total Number Tallied	Percent of Total Tally	Average Number Trees Per Acre
Black Locust	176	23.4	410
Red Maple	166	22.1	387
Black Birch	157	20.9	366
Yellow Poplar	72	9.6	167
Sourwood	38	5.1	88
Ash	31	4.1	72
White Pine	20	2.7	46
Sassafras	19	2.5	44
Yellow Pine (Shortleaf, Loblolly)	18	2.4	42
Pitch			
Sycamore	17	2.3	40
Elm	9	1.2	21
Willow	7	0.9	16
Sugar Maple	5	0.7	12
Beech	4	0.5	9
Serviceberry	4	0.5	9
White Oak	3	0.4	7
Red Oak	2	0.3	5
Black Cherry	2	0.3	5
Puckeye	1	0.1	2
Red Cedar	1	0.1	2
TOTALS	752		1,750

Table 3, showing the diameter distribution of the tallied trees, and Table 4, showing the height distribution, indicate that the average size of the tree seedlings on VICC surface mines is quite small, with about 60 percent of the trees being less than one inch in diameter and about 80 percent being 10 feet or less in height. Of course, this is to be expected since most of the lands have been mined or remined during the past eight years.

Table 3.--VICC Surface Mine Tree Seedling Inventory
Diameter Distribution

Diameter Class (Inches)	Number of Trees Tallied	Average Number Per Acre
Less than 1	455	1,058
1	95	223
2	88	205
3	50	116
4	20	46
5	7	16
6	8	19
7	6	14
8	7	16
9	4	9
10	6	14
11+	6	14
TOTAL	752	1,750

Table 4.--VICC Surface Mine Seedling Inventory
Height Distribution

Height Class (Feet)	Number of Trees Tallied	Average Number Per Acre
Less than 1	193	452
1 - 5	261	607
6 - 10	158	367
11 - 20	90	209
21 - 30	20	46
31 - 40	20	46
41 +	10	23
TOTAL	752	1,750

Conclusions

VICC surface mines have an adequate number of tree seedlings per acre, although the distribution of seedlings is not uniform due to past reclamation practices. Provided that suitable conditions exist for seedling establishment, natural reseeding of trees can be expected to reforest most of these surface mines where trees are not presently found.

Pioneer tree species comprise most of the trees included in the seedling inventory. Future tree planting on surface mined areas should be aimed at increasing the growing stock of the more valuable hardwood species, such as the oaks, or of pure stands of the more easily managed pines.