

**Study A:**

**The Effects of Two Cultural Treatments on Five  
Christmas Tree Species Grown on Reclaimed  
Mine Land**

**Study B:**

**Christmas Trees Demonstration Site**

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## **Study A:**

### The Effects of Two Cultural Treatments on Five Christmas Tree Species Grown on Reclaimed Mined Land

#### Introduction:

Christmas trees are grown to be used as decoration or a symbol of joy during the Christmas holiday. The trees are also used for ground cover and wind barriers. They can also be grown for decorations in yards at homes as well as other establishments.

They require much less disturbance of the ground cover than agronomic crops. They can grow where broadleaf trees cannot grow. The two studies will be of great educational benefits to students of the MECC Environmental Science program who are using the study for field trips and on-the-job training. It will also serve as a demonstration plot to the entire community.

#### Objectives:

##### -----Research-----

1. Determine if using Brush Blanket® will promote growth by inhibiting unwanted weed growth, increasing moisture retention, and raising soil temperatures around seedlings.
2. Determine the effects of slow-release fertilizer on growth and establishment of trees at time of planting.

##### -----Educational-----

1. Establish a demonstration area for educational programs.
2. Instruct students on how to take care of Christmas trees.

#### Methods and Materials:

This multi-year project was started in the Spring of 2000. The site of this study is located eight miles east of Norton, Virginia (Powell River Project). The following Christmas tree species were selected for this project:

1. White Pine
2. Douglas Fir
3. Blue Spruce
4. Scotch Pine
5. Fraser Fir

The following plots were used to determine growth and results were compared:

1. Brush Blanket®
2. Bare Plots
3. Plots with slow-release fertilizer

A grid of 6' x 6' was used so that the trees would have plenty of space for growth and development. Twenty seedlings were planted per row. The fertilizer treatments were planted

with an Agriform® 21g slow-release fertilizer pellet (20-10-15) placed four inches deep within four-six inches of either side of the seedlings. On the bare plots nothing (no treatment) was added. The plots with Brush Blankets® will promote rapid growth of seedlings by inhibiting unwanted weed growth.

### Results and Discussion:

In this third year report of the project, much more was learned about how each species grows under certain conditions. On site, the members of the Environmental Science Club and the Forestry and Environmental students were involved in planting, pruning, and application of Brush Blankets®. The plots were cleared for better growth and accessibility to observe trees.

There were several problems encountered on the site: soil compaction, rock fragments in the soil, late frost damage, rabbits feeding on trees, and water-logged areas. All of these factors affected the growth and survival of the trees and seedlings.

The soil test performed indicated many variations in the pH levels. The pH ranged from 5.5 to 6.0. The soil test results also showed many variations in nitrogen, potassium, and phosphorus contents.

Tree mortality also varied by treatments and species (Table 1). Figure 1 showed the distributions of living tree species according to treatments.

### Statistical Analysis:

Standard deviations, means, and ranges were used. These were used as an index of dispersion of individual treatments about the means (Table 2).

### Conclusions:

The third year data suggest that all the species performed well on Brush Blanket® and fertilizer plots except for Blue Spruce, where the treatments were the same. Survival counts at the end of the fifth year will provide a more appropriate measure on how these species have performed.

Table 1: Living Trees With Maximum of 20 Trees Per Row. Year = 3 (2002)

Treatments	----- Tree Species -----				
	White Pine	Douglas Fir	Blue Spruce	Scotch Pine	Fraser Fir
Fertilizer	13	16	14	15	14
Bare Plot	6	12	14	13	9
Brush Blanket®	16	14	14	15	16

Table 2: Means, Standard Deviations, and Ranges of Treatments

Function	Tree Species				
	White Pine	Douglas Fir	Blue Spruce	Scotch Pine	Fraser Fir
Standard Deviation	5.13	2.00	0.00	1.15	3.60
Mean	11.67	14.00	0.00	14.33	13.00
Range	6-16	12-16	14-14	13-15	9-16

### Study B:

Christmas Trees Demonstration Site

#### Materials and Methods:

The Christmas trees demonstration plots were established during the Spring of 1994 on reclaimed surface mined land. The individual 6' x 6' plots were established with seedlings ranging from two to three years old.

The following Christmas tree species were planted randomly:

1. White Pine
2. Scotch Pine
3. Douglas Fir
4. Fraser Fir
5. Norway Spruce
6. Blue Spruce

The soil pH of this site ranged from 5.5 - 6.00. Deficiencies in nutrients were corrected by placing two fertilizer pellets in a hole located about four to six inches on each side of the seedlings. The plots are mowed during the summer as needed by students. The trees were also sheared with shearing knives during the month of June.

## Objectives:

### -----Educational-----

1. To demonstrate different planting methods to students
2. To show students how to take care of Christmas trees
3. To demonstrate shearing and harvesting to students
4. To show students how to market Christmas trees
5. To serve as a demonstration plot to the entire community

## Results and Discussion:

Considerable progress has been made with this project. This site is used for the following functions/classes:

1. AGR 205: Soil Fertility and Management
2. AGR 208: Insect Identifications and Control
3. FOR 100: Introduction to Forestry
4. FOR 215: Applied Silviculture
5. FOR 115: Dendrology
6. ENV 290/FOR 290: Internship
7. Region V Governors School/Southwest Virginia Community College

Some of the problems encountered were:

1. Dry weather mainly following the months of planting
2. Compacted soil/water-logged areas
3. Rock fragments
4. Frost

Overall, the health of the harvestable trees was good. The expected harvest for the coming winter is 25 – 30 Christmas trees.

## Conclusions:

The first harvesting will be done by students during the month of November 2003. At this time, tree heights and diameter at breast height will also be recorded. The economic analyses will also be performed by students.