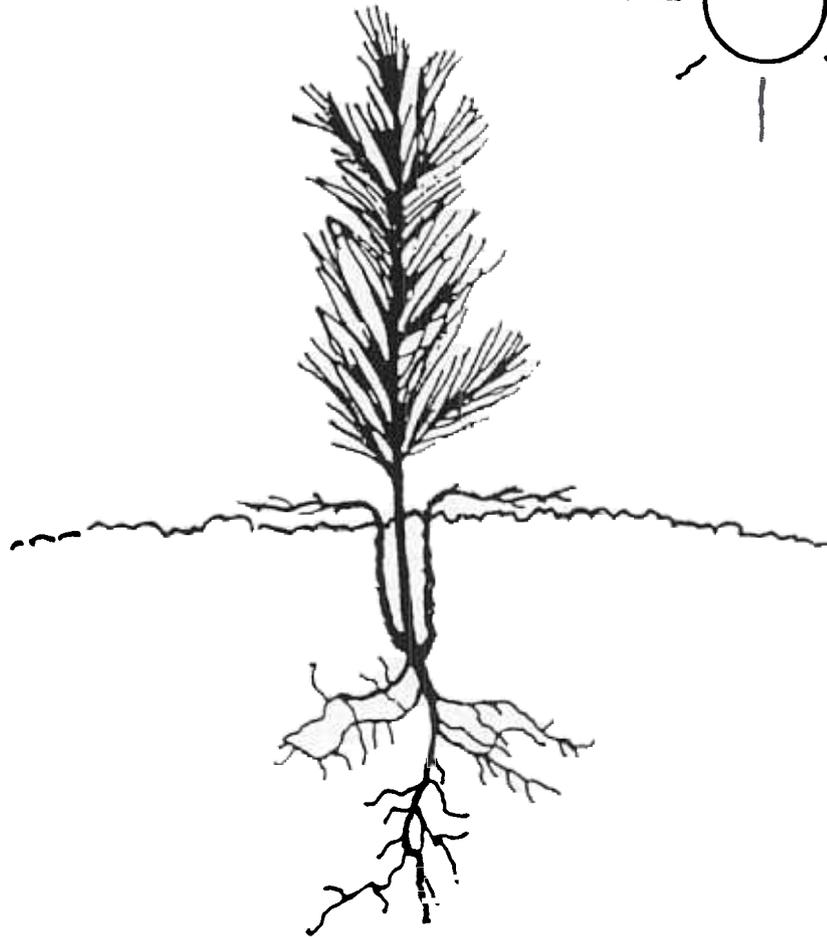
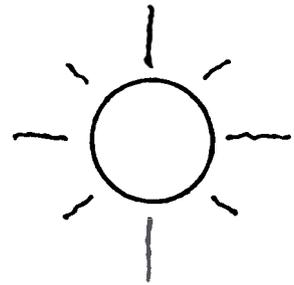
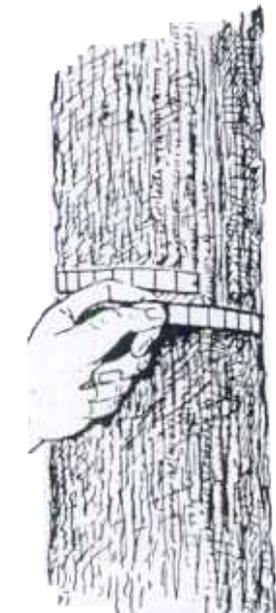
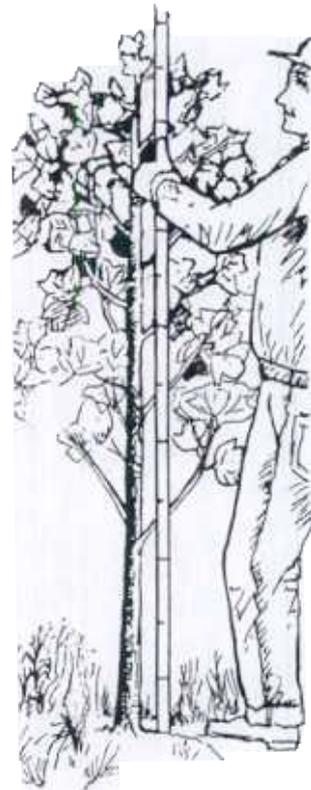


LATERAL ROOTS EXTENDING FROM THE PLANTING HOLE HOW SERIOUS?



Virginia
Department of Forestry



LATERAL ROOTS EXTENDING FROM THE PLANTING HOLE--HOW SERIOUS?

By: Thomas A. Dierauf

ABSTRACT

Planting loblolly pine seedlings so that one or more long lateral roots extended from the planting hole and were exposed on the surface did not reduce survival or subsequent height growth.

INTRODUCTION

We operationally root prune our loblolly pine seedlings at the end of the grading table, trying to cut back lateral roots to not over five or six inches long. Tap roots are, in most cases, pruned to a length of five to six inches by the undercutter blade of the lifting machine. Quite often, long lateral roots will make it through the pruning process. Long lateral roots are difficult to get completely into the planting hole. The question comes up of how serious it is if lateral roots are left exposed on the ground surface following planting. We are quite sure they should not be stripped off, but is it worth the trouble to prune them off before planting?

We put in similar small studies during the 1986-87 and 1987-88 planting seasons. The objective was to determine whether survival is reduced by planting so that long lateral roots are left outside the planting hole.

PROCEDURE

On March 4, 1986, we carefully dug up some seedlings at our New Kent nursery to save as many long roots as possible. Two days later, on March 6, we selected pairs of seedlings of about the same root collar diameter and randomly selected one seedling of each pair to prune the roots to a length of about five inches (we did this by smoothing all lateral roots down along the tap root and cutting everything at a point about five inches below the first lateral root). The other seedling was not root pruned. Both seedlings were planted properly (i.e., trying to get the tap root to the bottom of a hole seven or eight inches deep and closing the hole properly). For the seedling that was not root pruned, we made sure that we left at least one lateral root extending out of the hole and lying on the surface. We planted two rows at a time, one row root pruned and the other not, with 15 seedlings in each row. This constituted a replication, and we replicated the treatments three times for a total of 45 seedlings of each type.

The 1987-88 study was similar. We hand-lifted seedlings on December 8 from our Sussex nursery. The next day, on December 9, we installed four 20-seedling rows, two rows root pruned and two rows not, following the same procedures as before. Later in the season, on February 16, we planted four more rows, two rows of each treatment, using seedlings that had been hand-lifted a few weeks earlier from the Sussex nursery and kept in cold storage.

Obviously, the seedlings which were not root pruned had more lateral roots when they were planted than the seedlings that were pruned to five inches. The difference was greater than if we had used seedlings that had been operationally root pruned at the end of the grading table, because operational root pruning removes all or most of the long laterals.

Seedling survival and height were measured annually for 3 years.

RESULTS

We made it a point to go back and check the condition of the exposed lateral roots within two or three weeks after planting. The exposed lateral roots had died back to the ground surface by this time. Air-pruning took place soon after the seedlings were planted.

The exposed roots did not reduce survival and height growth (Table 1).

Table 1. Average survival and height (in feet) after three seasons in the field.

<u>Treatment</u>	<u>Survival Percent</u>			<u>Height</u>		
	<u>1986-87</u>	<u>1987-88</u>		<u>1986-87</u>	<u>1987-88</u>	
	<u>March</u>	<u>Dec.</u>	<u>Feb.</u>	<u>March</u>	<u>Dec.</u>	<u>Feb.</u>
Roots Buried	80.0	95.0	95.0	3.6	6.1	6.0
Roots Exposed	82.3	100	97.5	3.5	6.3	6.2

Survival was actually slightly higher in both years for seedlings planted with roots exposed, but the differences were not statistically significant (Table 2). However, if exposed lateral roots air-prune so quickly that they present no problem, then the additional lateral roots on the unpruned seedlings may have favored survival over the pruned seedlings.

Table 2. Analysis of variance of survival percents transformed to arc sine, for both studies.

<u>Study</u>	<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Prob.</u>
1986-87	Treatments	1	3.76	.20	.70
	Blocks	2	17.27	.93	.52
	Error	2	18.50		
1987-88	Treatments	1	3.81	.06	.82
	Blocks	3	83.22	1.40	.39
	Error	3	59.45		