



CONVERTING PASTURELAND IN MISSISSIPPI TO LOBLOLLY PINE

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A Plant Note from the Jamie L. Whitten Plant Materials Center

Forestry ranks as the top revenue producing crop in Mississippi, which means that many acres of trees are planted in the state. Additional interest has been spurred by the Conservation Reserve Program that offers financial incentives to encourage tree planting on marginal pastureland and cropland.

The success or failure of a new tree planting is influenced primarily by the ability of the root system to begin quickly taking up water and nutrients. Competition from perennial grasses and other weeds can affect survival, vigor, and production of young seedlings in pastureland sites converted to trees. The landowner's decision to use herbicides is often driven by economics and whether a measurable benefit can be obtained from applying herbicides compared to the common practice of mowing to control perennial weed growth during establishment of loblolly pine seedlings.

Staff from the USDA, Natural Resources Conservation Service (NRCS) Jamie L. Whitten Plant Materials Center (PMC), Lynn Ellison, NRCS Area 1 forester, and Alan Holditch, NRCS Mississippi state forester began a trial to compare herbicides and common site preparation treatments on early growth of loblolly pine seedlings (Table 1). The trial was conducted in 2002 and 2003 at the PMC on a Grenada silt loam soil in a mixed grass sod (i.e. bermudagrass, bahiagrass, broomsedge, dallisgrass, and fescue). Superior loblolly pine seedlings from International Paper (IP Select) were planted in January of each year using NRCS standard practice for pine tree establishment (612). Herbicide treatments were sprayed in a 6-foot band. In treatments 3, 4, and 5, the Roundup (glyphosate) and/or Oust (3 oz/acre) treatments were applied in the fall and winter prior to tree planting. Results of the treatments on growth of one-year-old loblolly pine seedlings are presented in Table 2.

Table 1. List of site preparation treatments and target application date for loblolly pine establishment at the Jamie L. Whitten Plant Materials Center, Coffeeville, MS.

Treatment	Rate	Date	Treatment	Rate	Date	Treatment	Rate	Date
1 Control								
2 Mowing		06/01						
3 Roundup ¹	4 qt/ac	09/15						
4 Roundup	4 qt/ac	09/15	Oust ²	3 oz/ac	12/15			
5 Roundup	4 qt/ac	09/15	Oust	3 oz/ac	12/15	Arsenal	4 oz/ac	04/01
6 Arsenal	4 oz/ac	04/01	Oust	2 oz/ac	04/01			
7 Arsenal	4 oz/ac	04/01	Oust	2 oz/ac	04/01	Transline	4 oz/ac	04/01

¹ The 4 qt/acre rate of Roundup Ultra Max used in this study would be equivalent to 5 qt/acre of a generic formulation of glyphosate.

² No surfactant was used with the Oust treatments.

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Consult herbicide labels on all products before use.

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Table 2. Basal stem diameters and height of one-year-old loblolly pine seedlings in 2003 and 2004 using different site preparation treatments.

Treatment	Diameter (mm) ¹		Height (cm) ²		% Weed Stand ³	
	2003	2004	2003	2004	2003	2004
Control	6.6	4.2	52	23	98	100
Mowing	8.1	4.1	61	25	100	100
Roundup	9.9	4.3	65	24	93	95
Roundup + Oust	10.5	4.5	64	24	55	80
Roundup + Oust + Arsenal	11.1	4.3	74	27	49	62
Arsenal + Oust	8.9	4.5	58	25	92	97
Arsenal + Oust + Transline*	8.2	4.5	54	24	95	93
LSD (P< 0.05)	2.1	NS ⁴	12	NS	18	12

¹ To convert mm to inches multiply by 0.04; ² To convert cm to inches multiply by 0.40; ³ Percent weed cover determined visually in July; ⁴ Not significant at P<0.05.

* Transline is not recommended for pastureland conversion.

Summary

A fall application of Roundup alone or in combination with Oust and Arsenal provided favorable results; however, the cost of this treatment (Table 3) exceeded the others because three separate applications were made. Unfavorable weather conditions are the reason for such a drastic difference in plant measurements in 2004 compared to 2003. Excessive rainfall in late winter and early spring of 2004 caused the seedlings to yellow and cease growth, which completely masked beneficial effects from the herbicides that were seen in the previous year. Percent weed control estimates evaluated in July followed the same pattern in 2003 and 2004.

Table 3. Cost comparison of site preparation treatments to convert marginal pastureland to loblolly pine

Treatment	Cost/acre ¹
Control	\$0
Mowing	\$15.00
Roundup	\$40.00*
Roundup + Oust	\$76.00
Roundup + Oust + Arsenal	\$103.00
Arsenal + Oust	\$38.00

¹ Cost/acre for Roundup were quoted by a local supplier in Tupelo, MS and prices for the other chemicals were obtained from UAP Timberland in Carrollton, MS.

* Replacing Roundup with a generic glyphosate formulation would save about \$15 per acre.



The numbers below each row of trees correspond to treatment numbers listed in Table 1. The trees to the far right are part of an untreated border row.

Herbicide Recommendation

The herbicide treatments used in this study were the best treatment combinations available at the time the study was planned. The following recommendations are the most current ones for establishing loblolly pines in mixed-grass pastures developed using results of this and similar trials conducted throughout the southeastern states. These treatments are not recommended for other types of planting sites (e.g. cropland or cutover).

- Apply 4 qt/acre generic glyphosate (4 lb/ai) + 4 oz/acre Oust Extra (75% Oust and 25% Escort) + 4 oz Entry II (surfactant) at 15 gallons per acre
- Apply in a single application in September

Note: When tank mixing these chemicals, fill the tank halfway with water, add Oust Extra first, then add the glyphosate, and, lastly, the surfactant.

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