

STEM REDUCTION ON PINE SITES FOLLOWING HIGH RATES OF GLYPHOSATE. A.W. Ezell, L.R. Nelson, and J.L. Yeiser, Mississippi State University, Starkville, Clemson University, Clemson, S.C., and Stephen F. Austin State University, Nacogdoches, TX.

ABSTRACT

A total of eleven herbicide treatments were applied to recently cutover sites to evaluate the efficacy of the materials for site preparation. Brownout at 6 WAT was generally excellent and burning would be facilitated by use of these treatments. Generally, the higher rates of glyphosate alone or mixed with imazapyr gave best total control. MON 59120 mixed well with Accord, and MON 78300 performed very well alone at the 6 and 8-quart rates.

INTRODUCTION

MON 78300 has demonstrated excellent brownout results and competition control in forestry site prep applications. This study was installed to evaluate the efficacy of MON 78300 alone and in tank mixtures for site prep hardwood and natural pine control and to evaluate MON 59120 as a surfactant for use with Accord.

METHODS

A total of 11 herbicide treatments were applied and an untreated check area was included for basis of comparison (Table 1). Each treatment was replicated three times on linear plots 25 ft. x 100 ft. All spray applications were completed with a CO₂-powered backpack sprayer with a pole extension and KLC9 nozzle. Spray volume was 10 gpa.

The treatments were applied to recently harvested clear-cut areas in South Carolina, Arkansas, and Mississippi in August 1998. Treatment assignment followed a completely randomized design in plots, which were marked with metal rebar at the center of each end of the plot and nylon string stretched between the metal stakes. The string provided the basis for direction during spray application and stem count evaluations.

Woody stems were tallied prior to spray application in a 10 ft. x 80 ft. evaluation area centered with the spray treatment plot. Stems were tallied by species and height class. Principal species occurring on the study areas included white oak, loblolly pine, green ash, mockernut hickory, red maple, black cherry and red oaks.

At 6 WAT, all plots were evaluated with an ocular estimation of percent brownout for different vegetation classes. Final stem counts were completed in October 1999, and observations were recorded by species and height class. Results were analyzed to evaluate any statistical differences among the treatments with Duncan's New Multiple Range Test used for specific comparisons and separation.

RESULTS

The brownout response in the study was reported previously, but to review, the treatments with 6 or 8 quarts of glyphosate generally gave a better brownout than those with 4 quarts. Brownout did vary slightly by location, but overall, response would have been adequate for burning if desired.

Woody stem control for the individual study sites are presented in Tables 2, 3, and 4. Two of the study areas had substantial amounts of loblolly pine present with densities of 2000-3000 stems/acre in many areas. Only six of the treatments resulted in consistently good control of the pine. Generally, these are the treatments which had 6 or 8 quarts of glyphosate (Table 2 and 3).

Green ash, sweetgum, white oak, and black cherry were all controlled by the treatments in the study. Exceptions would be Treatments 4 and 8 on black cherry. Hickory control did not follow a straight-line response, but generally, the mixtures with imazapyr (Trts. 2, 3, 4, and 11) gave better control. Waxmyrtle was difficult to control but six of the treatments did result in 80% or greater control (Table 2).

Overall, treatment response can be grouped into three categories. Best control was from Treatments 3, 4, 7, and 11. Good control was obtained from Treatments 2, 6, 9, 10, and 12. Finally, Treatments 5 and 8 performed well but perhaps not at the level required for most site prep operations.

SUMMARY

The research sites in this study carried a spectrum of woody species which ranged from highly susceptible to resistant to glyphosate. It therefore provided a tough yet representative test of field applications of these products and mixtures across the South. Brownout was excellent and prescribed burning would be facilitated by use of these treatments, especially the ones with higher rates (6 or 8 qts.) of glyphosate.

Overall, control of woody species ranged from good to excellent. Generally, higher rates (6 or 8 qts.) of glyphosate alone or mixed with imazapyr resulted in the best total control. Given the proper species mix MON 78300 can be used effectively alone. MON 59120 worked well with Accord and resulted in comparable control to MON 78300 at the 6 and 8 qt. rate.

Table 1. List of treatments in 1998 Monsanto field trials.

Treatment No.	Products – Rate/Acre
1	Untreated Check
2	MON 78300 + Arsenal AC – (6 qts. + 2 oz)
3	MON 78300 + Arsenal AC – (6 qts. + 4 oz)
4	MON 78300 + Arsenal AC – (6 qts. + 6 oz)
5	MON 78300 – (4 qts.)
6	MON 78300 – (6 qts.)
7	MON 78300 – (8 qts.)
8	Accord + MON 59120 – (4 qts. +2.5%)
9	Accord + MON 59120 – (6 qts. + 2.5%)
10	Accord + MON 59120 – (8 qts. + 2.5%)
11	MON 78300 + Arsenal AC – (4 qts. + 12 oz)
12	MON 78300 + Escort – (4 qts. + 1 oz)

Table 2. Woody stem control (percent change) in 1998 Monsanto site preparation study – AR

Treatment	Species				Total
	Pine	S. Gum	Waxmyrtle		
	percent				
Untreated	+120 c	+123 b	+118 c		+120 c
M 7 + AR (6+2)	- 70 a ¹	- 100 a	- 94 a		- 88 a
M 7 + AR (6+4)	- 77 a	- 96 a	- 55 ab		- 76 a
M 7 + AR (6+6)	- 92 a	- 100 a	- 88 a		- 93 a
M 7 (4)	- 75 a	- 100 a	- 65 ab		- 80 a
M 7 (6)	- 77 a	- 97 a	- 75 ab		- 83 a
M 7 (8)	- 87 a	- 96 a	- 81 ab		- 88 a
AC + M 5 (4+2.5)	- 38 b	- 83 a	- 47 b		- 56 b
AC + M 5 (6+2.5)	- 89 a	- 83 a	- 56 ab		- 76 a
AC + M 5 (8+2.5)	- 86 a	- 100 a	- 65 ab		- 84 a
M 7 + AR (4+12)	- 80 a	- 92 a	- 57 ab		- 76 a
M 7 + ES (4+1)	- 76 a	- 98 a	- 58 ab		- 78 a

¹Negative values indicate a decrease in stems and values followed by the same letter in a column do not differ at p = 0.05

Table 3. Woody stem control (percent change) in 1998 Monsanto site preparation study – MS.

Treatment	Species ¹				Total
	SCO/WHO	LLP	GRA	HIC	
	percent				
Untreated	0 a	+133 e	- 85 b	- 14 e	+87 c
M 7 + AR (6+2)	-100 a ²	- 86 a	-100 a	-100 a	- 96 a
M 7 + AR (6+4)	-100 a	- 84 a	- 90 a	- 67 c	- 91 a
M 7 + AR (6+6)	-100 a	- 85 a	- 90 a	- 80 b	- 92 a
M 7 (4)	-100 a	- 52 c	- 93 a	- 67 c	- 83 a
M 7 (6)	-100 a	- 73 ab	- 50 c	- 46 d	- 85 a
M 7 (8)	-100 a	- 86 a	-100 a	- 75 b	- 94 a
AC + M 5 (4+2.5)	-100 a	- 52 c	-100 a	- 55 cd	- 71 ab
AC + M 5 (6+2.5)	-100 a	- 73 ab	- 95 a	- 47 d	- 86 a
AC + M 5 (8+2.5)	-100 a	- 81 a	-100 a	- 71 bc	- 89 a
M 7 + AR (4+12)	-100 a	- 80 a	- 88 ab	- 93 a	- 89 a
M 7 + ES (4+1)	-100 a	- 41 cd	-100 a	- 75 b	- 81 a

¹ SCO/WHO = Swamp chestnut and white oak, LLP = loblolly pine, GRA = green ash, HIC = hickory

² negative values indicate a decrease in stems and values followed by the same letter in a column do not differ at p = 0.05

Table 4. Woody stem control (percent change) in 1998 Monsanto site preparation study – SC.

Treatment	Species		
	Black Cherry	Red Oaks	Total
	-----percent-----		
Untreated	- 40 ab	0 d	0 d
M 7 + AR (6+2)	-100 a ¹	-83 ab	-91 ab
M 7 + AR (6+4)	-100 a	-95 a	-91 ab
M 7 + AR (6+6)	- 58 ab	-92 ab	-96 a
M 7 (4)	-100 a	-55 abc	-70 b
M 7 (6)	-100 a	0 d	-98 a
M 7 (8)	-100 a	-83 ab	-90 ab
AC + M 5 (4+2.5)	- 7 b	- 8 cd	-52 c
AC + M 5 (6+2.5)	- 58 ab	-45 bcd	-75 abc
AC + M 5 (8+2.5)	- 92 ab	-75 ab	-90 ab
M 7 + AR (4+12)	- 93 ab	-80 ab	-89 ab
M 7 + ES (4+1)	-100 a	-49 abc	-93 ab

¹ Negative values indicate a decrease in stems and values followed by the same letter in a column do not differ at P = 0.05

ADDITION OF SULFOMETURON METHYL TO FALL SITE PREP APPLICATIONS INCREASES HERBACEOUS WEED CONTROL DURING THE FOLLOWING GROWING SEASON. A.W. Ezell, Mississippi State University, Starkville.

ABSTRACT

A total of 12 herbicide treatments were applied to a recently cutover site to evaluate their efficacy for site preparation. In four of the treatments, Oust[®] was added to evaluate the ability to control herbaceous vegetation the following growing season. Ten of the twelve treatments resulted in very good control of the woody species on the study site. The addition of Oust gave excellent herbaceous weed control during the following growing season, with control evident 11.5 months following application.

INTRODUCTION

For years, sulfometuron methyl has been a principal product for herbaceous weed control in pines or hardwoods. The vast majority of this work has been done as a post-plant application, and took the form of a release operation. However, interest in adding Oust[®] to the site preparation treatment has increased in recent years.

OBJECTIVE

The objective of this study was to evaluate the efficacy of (1) fall Oust[®] applications during site prep in control of herbaceous competition the following growing season and (2) woody stem control, by the tank mixes utilized.

METHODS

A total of 13 treatments (Table 1) were utilized in the study with three replications of each treatment. Plot installation was in a CRD layout. Each plot consisted of a 25 ft. x 100 ft. rectangular spray area marked with metal rebar center posts and nylon string stretched between the rebar. The sample area of 10 ft. x 80 ft. was centered in the treatment plot

The study was installed on land owned by The Timber Company in Noxubee Co., Mississippi. The soils were Wilcox-Faulkner silty clay loam with pH=5.7. The site had been harvested in December 1997, and the treatments were applied early September 1998.

All woody stems in the sample area were tallied by species and height class prior to spray application. Plots were evaluated ocularly for percent brownout by vegetation class at 6 WAT. Woody stems were tallied again in November 1999 to assess control and herbaceous vegetation coverage was evaluated ocularly in June, July, and August 1999.

RESULTS

The addition of Oust to the treatments resulted in excellent herbaceous control during the following growing season (Table 2). By June 1999, the site had been invaded and colonized by fireweed (*Erechtites heiracifolia*) and a number of lesser species scattered across the area. *Panicum* spp. were also present in the area. The treatments which contained Oust generally had 50-60% more clear ground than the other treatments. This effect continued through July, and even though control was breaking down by mid-August, three of the four Oust treatments still had 40% clear ground.