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Herbicides and Timing for Control of Broomsedge in Conservation Reserve Fields

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ABSTRACT

Glyphosate (Roundup®) at rates of 2.0 and 3.0 ai/acre and MSMA (monosodium methanearsonate) at 3.0 ai/acre provided 91 to 100% control of broomsedge (*Andropogon virginicus* L.). Application dates were May 15, July 1 and August 15 in 1996-97. Percent control ratings were made 14 days after application and again September 25. Atrazine + paraquat (Gramoxone®) at 2.0 + 0.93 ai/acre averaged 61% control for applications after August 15 but was not effective at earlier application dates. Imazapyr (Arsenal®) + imazethapyr (Pursuit®) at 0.125 + 0.125 ai/acre, and atrazine + imazethapyr at 1.0 + 0.125 ai/acre did not provide adequate control of broomsedge for any date of application.

INTRODUCTION

Broomsedge, also referred to as sagegrass, is a native perennial bunchgrass that infests millions of acres of pasture and uncultivated land from the Atlantic seaboard west to central Texas (USDA Handbook, 1970). It is usually an indicator of low fertility and limited pasture management. Intensive grazing management and fertility have been reported to control broomsedge in pastures (Klingman and Easley, 1971; Peters and Lowance, 1973; Lowance et al., 1975; Redmon et al., 1995). However, this method of control is only effective over a 3 to 5 year period.

In the Southeast, broomsedge is found growing in near pure stands in noncropland fields such as those enrolled in the Conservation Reserve Program (CRP). Herbicides that are labeled for noncropland can be used in CRP fields before the contract expires. Chemical weed control of broomsedge may provide a more economical and immediate means of control while decreasing the potential for soil erosion. This experiment was conducted to evaluate rates and timing of various herbicides for the control of broomsedge in CRP fields.

MATERIALS AND METHODS

The first year of the study was conducted at the USDA Natural Resources Conservation Service, Jamie L. Whitten Plant Materials Center in Coffeeville, MS. The study was moved off the center to a near by farm the second year. Soil type for both years was an Oaklimeter silt loam (Coarse-silty, mixed, thermic Fluvaquentic Dystrochrepts). Experimental design was a split plot with four replications.

Herbicides and rates (lb ai/acre) were glyphosate (Roundup) at 1.0, glyphosate at 2.0, glyphosate at 3.0, atrazine + paraquat (Gramoxone) at 2.0 + 0.93, MSMA at 3.0, imazapyr

(Arsenal) + imazethapyr (Pursuit) at 0.125 + 0.125, and atrazine + imazethapyr at 1.0 + 0.125. Herbicide application dates for both years were May 15, July 1 and August 15.

Plot size was 12 x 25 feet. An untreated control served as a check. Herbicides were applied using a CO_2 powered back pack sprayer calibrated to deliver 20 gallons of water per acre. A nonionic surfactant was added at 0.25% (v/v) to treatments containing paraquat, imazapyr, or imazethapyr.

Plots were rated visually 14 days after treatment and in late September for percent broomsedge control. Analysis of variance was used to determine if significant differences occurred ($P \leq 0.05$) and LSD was used to separate means that differed significantly (Steel and Torrie, 1960).

RESULTS AND DISCUSSION

In 1996, Roundup, regardless of rate, provided excellent (94 to 100%) control of broomsedge at all application dates (Table 1). Similar results were found in 1997 except for the August 15 application of glyphosate at 1.0 ai/acre which only controlled 18% of the broomsedge (Table 2). MSMA provided $\geq$94% control of broomsedge for the June and August dates. Broomsedge control by atrazine + paraquat was highest for the August 15 application but was less than 50%. Imazadole (Arsenal and Pursuit) treatments did not provide any control of broomsedge

Table 1. Broomsedge control 14 days after application date, 1996.

		----------% Broomsedge Control----------		
Herbicide	Rate (lb ai/acre)	May 15	July 1	August 15
Roundup	1.0	97	94	95
Roundup	2.0	100	95	99
Roundup	3.0	100	99	96
Atrazine + paraquat	2.0 + 0.93	19	13	47
MSMA	3.0	99	21	94
Arsenal + Pursuit	0.125 + 0.125	0	0	0
Atrazine + Pursuit	1.0 + 0.125	0	0	0
Check		0	0	0
LSD (0.05)		11	6	7

A final measurement of percent control was made on September 25 in both years of the study. Only herbicide treatments that controlled more than 75% of the broomsedge, in a given year, are shown in Table 3.

Roundup and MSMA applied in June allowed for some desirable forage species to establish stands. These stands ranged from 20 to 95% coverage. Species included dallisgrass (*Paspalum dilatatum Poir.*), crabgrass (*Digitaria spp.*), and broadleaf signalgrass [*Brachiaria platyphylla (Griseb.) Nash.*]. We also noticed in some Roundup and MSMA treated plots that

broomsedge residue had completely decayed by September 25. This would be advantageous for drilling cool season forages or native grasses in the fall. MSMA is not registered for use in pastures and it should not be used in CRP fields that will be converted to pasture.

Table 2. Broomsedge control 14 days after application date 1997.

		----------% Broomsedge Control----------		
Herbicide	Rate (lb ai/acre)	May 15	July 1	August 15
Roundup	1.0	93	98	18
Roundup	2.0	95	100	94
Roundup	3.0	97	100	81
Atrazine + paraquat	2.0 + 0.93	88	13	3
MSMA	3.0	0	79	26
Arsenal + Pursuit	0.125 + 0.125	0	0	0
Atrazine + Pursuit	1.0 + 0.125	0	0	0
Check		0	0	0
LSD (0.05)		4	14	15

Table 3. Broomsedge control on September 25, for 1996 and 1997.

			% Control on Sept. 25	
Herbicide	Rate (lb ai/acre)	Applic. Date	1996	1997
Roundup	1.0	May 15	91	53
Roundup	2.0	May 15	99	78
Roundup	3.0	May 15	99	96
Roundup	1.0	July 1	100	88
Roundup	2.0	July 1	100	91
Roundup	3.0	July 1	100	94
Roundup	1.0	August 15	100	79
Roundup	2.0	August 15	100	100
Roundup	3.0	August 15	100	100
MSMA	3.0	May 15	98	48
MSMA	3.0	July 1	99	100
MSMA	3.0	August 15	100	100
Atrazine + Paraquat	2.0 + 0.93	August 15	41	83

Results of this study indicate that Roundup at rates of 2.0 and 3.0 ai/acre and MSMA at 3.0 ai/acre applied after July 15 provided good to excellent control of broomsedge. Atrazine +

Paraquat at 2.0 + 0.93 ai/acre provided no control except for the August 15 application in 1996 (41%) and 1997 (83%). Arsenal + Pursuit at 0.125 + 0.125 ai/acre, and Atrazine + Pursuit at 1.0 + 0.125 ai/acre provided no control of broomsedge for any date of application in both years. However, we did notice that plant height of broomsedge treated with Arsenal + Pursuit was approximately half that of the check plot.

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NOTE: Mentioning a trade name of a product does not imply endorsement by the USDA Natural Resources Conservation Service (NRCS) or by the Jamie L. Whitten Plant Materials Center.

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