

TURFGRASS PRODUCERS OF TEXAS RESEARCH REPORT-2008

TITLE: Weed Control and Turfgrass Response to Herbicides.

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I. INTRODUCTION

Weeds can greatly decrease the overall quality of turfgrass in Texas. A tremendous amount of money is spent each year by turf producers to control a plethora of weed species. Turfgrass producers are constantly applying herbicides to control various weeds found in sod including Texas panicum (*Panicum texanum*), bearded sprangletop (*Leptochloa fascicularis*), KR Bluestem (*Bothriochloa ischaemum*), and other grasses or broadleaf weeds. Bermudagrass, St. Augustine grass, and zoysiagrass are warm-season turfgrasses commonly used in home lawns, athletic fields, and golf courses throughout the southern United States. Due to the high demand for these grasses, turf farms must produce a large amount of quality turfgrasses and this requires the use of preemergence (PRE) and postemergence (POST) herbicides to control troublesome weeds. Some of these herbicides may injure the turf and the extent of this injury varies among species and varieties within a species. For sod producers, the questions that must be asked are first, will the herbicide control the weeds in question and secondly, and perhaps more importantly, will it do so without adversely affecting the re-growth or re-establishment of grass in a recently harvested field. Herbicides used in sod production must control the weed(s) in question, but must do so very selectively so as not to cause long-term injury to the turf being produced.

II. MATERIAL AND METHODS

Herbicides were evaluated in the summer of 2007 and the spring/summer of 2008 at several locations across south and south-central Texas. Sprangletop was evaluated on Buffalograss at Rod Farms in Wharton County, broadleaf weeds (PRE) and broadleaf signalgrass (POST) was evaluated on Tifway 419 bermudagrass at the King Ranch Turfgrass Farm near Gonzales, and KR bluestem was evaluated at the Texas AgriLife Research Station near Beeville in a monoculture situation. Each study was replicated three times in a randomized complete block design and ratings were taken during the evaluation phase of the project. Herbicides were applied using a small-plot CO₂ backpack sprayer calibrated to deliver 20 gal/A at 28 to 30 PSI. Each plot was 6 ft wide by 30 ft long with 1 to 2 ft on each side which was unsprayed and separated plots. An untreated check was included in each study. In the sprangletop study, the initial herbicide application was made on May 8, 2007 and the (follow-up) 2nd application was made on June 7. Also, in the PRE study, the initial herbicide application was made on February 14, 2008 with the 2nd application made on May 8.

III. RESULTS AND DISCUSSION

Sprangletop Control and Buffalograss Response to Postemergence Herbicides. After the initial herbicide application, sprangletop control 30 days after treatment (DAT) was greater than 90% with Accent at 1.25 oz/A (Table 1). Accent plus Acclaim Extra controlled 67% sprangletop while none of the other herbicide treatments controlled greater than 43%. When rated 39 days after 2nd application (69 days after the initial herbicide application), Accent alone controlled 98% sprangletop while Accent plus Acclaim Extra controlled 88% (Table 1). None of the other herbicide treatments controlled sprangletop better than 67%.

Buffalograss injury 30 days after 1st herbicide application was greatest with Prograss (43%) while any herbicide combinations which included Accent caused 13 to 30% turf injury (Table 1). When rated 39 days after 2nd herbicide application (69 days after the initial herbicide application), Prograss caused 92% injury. Accent alone caused 20% injury while MSMA alone at 2.65 and 4.0 pt/A caused 20 and 37% turf injury, respectively. Any combinations which included Accent caused 15 to 77% injury. The combination of Accent plus MSMA caused the greatest injury (77%).

Herbicide ^b	Rate/A	% Control		% Buffalograss injury	
		30 DAT ^c	69 DAT ^d	30 DAT	69 DAT
Untreated	-	0	0	0	0
Asulam	5.0 pt	23	33	8	0
Katana	3.0 oz	23	10	6	0
Prograss	4.0 qt	27	20	43	92
Acclaim Extra	20.0 oz	10	0	4	3
Acclaim Extra	25.0 oz	23	27	1	0
Accent	1.25 oz	92	98	13	20
MSMA	2.65 pt	10	47	4	20
MSMA	4.0 pt	20	17	12	37
Acclaim Extra+MSMA	25.0 oz + 4.0 pt	43	43	30	73
Accent + Acclaim Extra	1.25 oz + 25.0 oz	67	88	30	15
Accent + MSMA	1.25 oz + 4.0 pt	27	57	18	77
Accent + Acclaim Extra + MSMA	1.25 oz + 25.0 oz + 4.0 pt	53	67	15	63
LSD (0.05)		18	23	10	11

^a Two applications of each herbicide, approximately 30 day apart.
^b All herbicide treatments included Induce at 0.25% v/v.
^c 30 DAT, 30 days after initial herbicide treatment.
^d 69 DAT, 39 days after 2nd herbicide application or 69 days after initial herbicide treatment.

K.R. Bluestem Control Using Postemergence Herbicides. Under a monoculture situation, without any other grasses, glyphosate provided excellent control of bluestem when rated 27 and 62 DAT (Table 2). However, none of the other herbicides provided acceptable control when rated 62 DAT. MSMA provided acceptable control when rated 27 DAT but control was less than 40% at the other rating dates. When rated 146 DAT, none of the herbicides provided effective KR bluestem control. These herbicides do not have any residual activity and due to the high KR bluestem weed reservoir in the soil, long time bluestem control was not possible.

Table 2. Control of K R Bluestem with selected postemergence herbicides.				
Herbicide ^a	Rate/A	% Control		
		27 DAT ^b	62 DAT	146 DAT
MSMA ^c	2.65 pt	78	38	23
Glyphosate ^d	3.0 pt	98	98	43
MSMA + Revolver	2.65 pt + 26.2 oz	68	27	0
Acclaim Extra	20.0 oz	10	3	0
Accent	0.83 oz	3	7	0
Accent	1.25 oz	0	10	0
Accent + Acclaim Extra	1.25 oz + 20.0 oz	17	7	0
Accent + Acclaim Extra + MSMA	1.25 oz + 20 oz + 2.65 pt	67	40	20
Untreated		0	0	0
LSD (0.05)		17	18	16

^a All herbicides included Induce added at 0.25% v/v.
^b DAT, days after treatment.
^c MSMA applied twice, approximately 4 wk apart.
^d Formulated as Durango (5.4 E).

Broadleaf Weed Control and Bermudagrass Response to Preemergence Herbicides.

Weed pressure was light due to lack of rainfall and irrigation at the Gonzales County location. Atrazine at both rates, Monument, Katana, and Sencor at both rates controlled broadleaf weeds at least 92% when rated 46 DAT (Table 3). Only Kerb at 3.0 lb/A failed to control weeds at least 70%. When rated 128 DAT (40 day after 2nd treatment), Monument provided complete control while all other herbicide treatments with the exception of Kerb at 3.0 lb/A and Pennant Magnum at 1.0 pt/A controlled broadleaf weeds at least 83%.

Tifway 419 leaf burn was greatest with Sencor at 16 oz/A and both rates of Ronstar. No stunting with the higher rates of Pennant Magnum was noted during the growing season. This was probably due to lack of rainfall and/or irrigation within a reasonable time after herbicide application.

Table 3. Weed control and Tifway 419 response to preemergence herbicides.				
Herbicide	Rate/A	Control ^a		Injury ^b
		46 DAT	128 DAT	13 DAT
		%		
Untreated	-	0	0	0
Pendilum	4.0 pt	84	89	0
Barricade	1.0 lb	88	83	0
Barricade	2.0 lb	88	88	0
Surflan	2.0 qt	78	97	0
Surflan	4.0 qt	78	88	0
Kerb	1.5 lb	83	83	0
Kerb	3.0 lb	53	79	0
Princep	1.0 qt	85	97	0
Princep	2.0 qt	84	98	0
Atrazine	1.0 qt	94	98	0
Atrazine	2.0 qt	95	99	0
Pennant Magnum	1.0 pt	87	66	0
Pennant Magnum	1.5 pt	87	90	0
Pennant Magnum	2.0 pt	81	80	0
Monument	0.56oz	97	100	0
Katana	3.0 oz	92	98	0
Sencor	10.8 oz	94	91	0
Sencor	16.0 oz	98	90	8
Dimension	1.0 pt	80	96	0
Dimension	2.0 pt	74	83	0
Ronstar	3.0 lb	82	89	8
Ronstar	6.0 lb	88	88	25
Dismiss	4.0 oz	77	89	0
Dismiss	6.0 oz	88	89	0
LSD (0.05)		19	17	3
^a Weeds consisted of burr clover and other winter broadleaf weeds. Weed control ratings taken 46 days after herbicide application. ^b Bermudagrass injury consisted of leaf burn. Ratings taken 13 days after herbicide application.				

Broadleaf Signalgrass Control and Bermudagrass Response to Postemergence Herbicides. Under heavy broadleaf signalgrass pressure, MSMA + Drive and Monument + Accent provided at least 89% control at both ratings. Asulam and Accent alone controlled broadleaf signalgrass 95 and 85%, respectively, when rated 26 days after treatment (DAT) while control was less than 80% when rated 47 DAT (Table 4). Acclaim Extra controlled 52% broadleaf signalgrass 26 DAT and 75% broadleaf signalgrass 47 DAT. MSMA + Sencor controlled 67 to 72% signalgrass at both ratings. No other herbicides provided better than 50% control.

Tifway 419 bermudagrass injury (leaf yellowing or burn) was greatest with Prograss, Acclaim Extra, MSMA + Sencor, and Drive + Sencor.

Table 4. Broadleaf signalgrass control and Tifway 419 response to postemergence herbicides.				
Herbicide ^a	Rate/A	Injury ^b	Control	
		12 DAT ^c	26 DAT	47 DAT
		%		
Untreated	-	0	0	0
MSMA	2.65 pt	0	47	42
Asulam	5.0 pt	7	95	78
Drive	1.35 lb	0	23	10
Monument	0.56 oz	0	10	18
Revolver	26.2 oz	3	7	0
Katana	3.0 oz	8	3	7
Certainty	2.0 oz	3	0	0
Image	11.4 oz	0	0	0
Manor	0.5 oz	0	3	0
Prograss	4.0 qt	13	10	0
Acclaim Extra	20.0 oz	17	52	75
Accent	1.25 oz	0	85	70
Dismiss	4.0 oz	2	0	10
Dismiss	6.0 oz	2	3	3
MSMA + Image	2.65 pt + 11.4 oz	0	33	20
MSMA + Sencor	2.65 pt + 10.8 oz	13	67	72
MSMA + Drive	2.65 pt + 1.35 lb	2	90	89
MSMA + Monument	2.65 pt + 0.56 oz	3	47	37
MSMA + Revolver	2.65 pt + 26.2 oz	2	33	43
Revolver + Sencor	26.2 oz + 10.8 oz	8	7	0
Revolver + Image	26.2 oz + 11.4 oz	0	3	0
Image + Manor	11.4 oz + 0.5 oz	0	0	0
Revolver + Atrazine	26.2 oz + 2.0 pt	0	0	7
Drive + Sencor	1.35 lb + 10.8 oz	12	3	7
Sencor	10.8 oz	0	0	13
Monument + Accent	0.56 oz + 1.25 oz	3	95	91
LSD (0.05)		11	17	22

^a All herbicides included Induce added at 0.25% v/v.
^b Injury consisted of leaf yellowing and burn.
^c DAT, days after herbicide treatment.

In summary, several PRE and POST herbicides controlled problem weeds in turf. Sprangletop was effectively controlled with Accent but effective control requires that the grower continuously attack sprangletop or this weed will become an issue again after initial control. However, Accent is presently not cleared for use in turf production. KR Bluestem control was excellent with glyphosate; however, under most conditions the lack of selectivity with glyphosate would prevent its use. Accent, Asulam, MSMA + Drive, and Monument + Accent provided good to excellent control of broadleaf signalgrass.

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