

2013 Johnsongrass Control Trials

Introduction

Johnsongrass is a perennial warm season grass, listed as a noxious weed, and a common problem on right-of-way sites. There are a number of herbicides labeled and available to control johnsongrass but many can damage desirable cool season turf species, like tall fescue. One of the more selective herbicides for johnsongrass control is Fusion but a label change in 2012 made it unavailable for use on right-of-way sites. These trials are a continuation of the evaluation of the efficacy of a range of johnsongrass control/suppression options (alternatives to Fusion) including the tolerance of tall fescue to them.

Materials and Methods

Trials were established August 16, 2013 at Spindletop Research Farm and on August 20 near Camp Nelson along Hwy 27. The trials had 18 treatments with 3 replications arranged in a randomized complete block design with 5 ft by 30 ft plots. Application was at 30 gallons /acre. At Spindletop, the johnsongrass was 24 to 32 inches tall with an overall average canopy height of 30 inches and about 50% of plants had emerged seedheads. At the Camp Nelson site, the plants had been mowed earlier in the season. The plants were 20 to 30 inches tall with 5-6 leaves and none of them were flowering. These plots did not include tall fescue so a fescue damage trial was established Aug. 16, 2013 at Spindletop Research Farm. The plots were 5 ft x 20 ft with 5 ft unsprayed strips between each of the plots. The tall fescue canopy was at 10 inches. Johnsongrass control was assessed 14 (8/30/2013), 46 (10/1/2013), and 369 (8/20/2014) days after treatment (DAT) at Spindletop and 14 (9/3/2023), 42 (10/1/2013), and 303 (6/19/2014) DAT at the Camp Nelson site. Tall fescue damage (0 = dead to 9 = fully green; with unsprayed strips set at 8.0) was assessed 14 and 46 DAT. Grass stand density (0 – 9) was assessed 369 DAT. Data were analyzed using ARM software and treatment means were compared using Fisher's LSD at $p = 0.05$.

Table 1 lists the treatments, active ingredients and application rates. The 2011 Fusion label rates for selective control of johnsongrass were 7 to 9 fl oz per acre (Trts. 1 & 2). The labeled Fusilade II rates are repeated applications at 6 fl oz per acre to suppress johnsongrass in fine turf (Trt. 3). Trt. 4 is double this Fusilade II rate (12 fl oz/acre). The Acclaim Extra label lists 20 fl oz per acre to control seedling johnsongrass 12 – 24 inches tall (Trt. 5); 39 fl oz per acre to control rhizome johnsongrass 24 to 60 inches tall (Trt. 6); and a combination of Acclaim and Fusilade for improved turfgrass tolerance and to control rhizome johnsongrass 10 to 25 inches tall (Trt. 7). The Outrider label rates for selective johnsongrass control in tall fescue turf are 0.75 to 1 oz per acre (Trts. 8 & 9). Roundup (Trt. 13) and Journey (Trt. 16) are non-selective. Clearcast (Trt. 14) has an aquatic label and may be used close to waterways. The high rate of Plateau used in Trt. 15 will severely damage tall fescue. Pastora (Trt. 17) is only labeled for warm season pastures. MSMA can continue to be used and was included in these trials, but not in the 2012 trials. Trt. 10 is MSMA applied alone and Trt. 11 is MSMA applied in combination with Outrider at 0.75 oz per acre. Outrider is slow to show symptoms, so a combination of Outrider with Finale (Trt. 12) was included which would quickly injure johnsongrass.

Results and Discussion

At Spindletop, with many of the plants flowering at application, all the treatments controlled johnsongrass to some extent 46 and 369 DAT (Table 2). The slowest treatment to show symptoms was Pastora (Trt. 17). The most effective treatments 14 DAT were the MSMA treatments (Trts. 10 and 11), the Finale treatment (Trt. 12) and Roundup ProMax (Trt. 13), ranging from 83 to 88% control. At the 46 DAT assessment, these same treatments plus the high rate Acclaim Extra treatment (Trt. 6) were most effective, ranging from 78 to 98% johnsongrass control. The plots were not mowed before the final assessment in 2014 and early johnsongrass regrowth occurred under an established canopy. The most effective treatments 369 DAT were the Outrider treatments (Trts. 8 and 9), the MSMA treatments (Trts. 10 and 11), Roundup ProMax (Trt. 13), Plateau (Trt. 15), Journey (Trt. 16), and Pastora (Trt. 17), giving from 67 to 97% johnsongrass control.

At the Camp Nelson site, with younger non-flowering plants, all the treatments controlled johnsongrass to some extent 14, 42, and 303 DAT (Table 3). The most effective treatments 14 DAT were the ones with Fusion (Trts. 1 and 2), Fusilade II (Trts. 3 and 4), and Acclaim Extra (Trts. 5, 6, and 7) plus the Finale treatment (Trt. 12), providing from 65 to 75% control. The control plots had vigorous flowering plants 42 DAT and many of the plots already had regrowth from rhizomes. At this date, the most effective treatments were the ones with Fusion (Trts. 1 and 2), Fusilade II (Trts. 3, 4, and 7), Outrider alone (Trts. 8 and 9), Finale (Trt. 12), Clearcast (Trt. 14), Plateau (Trt. 15), and Journey (Trt. 16), with 83 to 94% johnsongrass control. At the final assessment date (303 DAT), the most effective treatments were the high rate of Fusion (Trt. 2), the Fusilade II treatments (Trts. 3 and 4), three of the Outrider treatments (Trts. 9, 11, and 12), Clearcast (Trt. 14), Plateau (Trt. 15), Journey (Trt. 16), and Pastora (Trt. 17), with 77 to 93% johnsongrass control.

Severe fescue damage was evident 14 DAT with the Finale, Roundup, and Journey treatments (Trts. 12, 13, and 16) (Table 4) and which became more severe for the Roundup and Journey treatments 46 DAT while the Finale treatment (Trt. 12) had largely recovered. Other treatments showing greater damage 46 DAT included the Acclaim Extra + Fusilade II combination (Trt. 7), Clearcast (Trt. 14) and Pastora (Trt. 17). Treatments which had grass stands less dense than control 369 DAT included Roundup, Journey, and Pastora (Trt. 13, 16, and 17).

There were differences in johnsongrass control between the two locations. One concern with combining a fast acting herbicide, like MSMA, with a slower acting one, like Outrider, (Trt. 11) is that long term efficacy will be reduced. However, this was not observed at either location. Tall fescue damage was not affected by these combination treatments either.

Non-Crop and Invasive Vegetation Management Weed Science
2013 Annual Research Report

Table 1. Treatments and Active Ingredients for Johnsongrass Control Trials

Trt. No.	Product Name	Rate	Rate Unit	Active Ingredient(s)	ai Rate (per acre)
1	Fusion Activator 90	7 0.25	FL OZ/A % V/V	fluazifop + fenoxaprop	1.75 oz + 0.49 oz
2	Fusion Activator 90	9 0.25	FL OZ/A % V/V	fluazifop + fenoxaprop	2.25 oz + 0.63 oz
3	Fusilade II Activator 90	6 0.25	FL OZ/A % V/V	fluazifop	1.5 oz
4	Fusilade II Activator 90	12 0.25	FL OZ/A % V/V	fluazifop	3 oz
5	Acclaim Extra Activator 90	20 0.25	FL OZ/A % V/V	fenoxaprop	1.4 oz
6	Acclaim Extra Activator 90	39 0.25	FL OZ/A % V/V	fenoxaprop	2.78 oz
7	Acclaim Extra Fusilade II COC	7 14 1	FL OZ/A FL OZ/A % V/V	fenoxaprop fluazifop	0.5 oz 3.5 oz
8	Outrider Activator 90	0.75 0.25	OZ/A % V/V	sulfosulfuron	0.563 oz
9	Outrider Activator 90	1 0.25	OZ/A % V/V	sulfosulfuron	0.75 oz
10	MSMA	32	FL OZ/A	monosodium acid methanearsonate	24 oz
11	Outrider MSMA	0.75 32	OZ/A FL OZ/A	sulfosulfuron monosodium acid methanearsonate	0.563 oz 24 oz
12	Outrider Finale Activator 90	0.75 2 0.25	OZ/A QT/A % V/V	sulfosulfuron glufosinate	0.563 oz 8 oz
13	Roundup ProMax	22	FL OZ/A	glyphosate	12.4 oz ae
14	Clearcast MSO	32 1	FL OZ/A % V/V	imazamox	4 oz ae
15	Plateau MSO	8 1	FL OZ/A % V/V	imazapic	2 oz ae
16	Journey MSO	21.3 1	FL OZ/A % V/V	imazapic + glyphosate	2 oz ae + 4 oz ae
17	Pastora Activator 90	1 0.25	OZ/A % V/V	nicosulfuron + metsulfuron	0.562 oz + 0.15 oz
18	Nontreated Check				

Non-Crop and Invasive Vegetation Management Weed Science
2013 Annual Research Report

Table 2: Treatments and Results for Johnsongrass Control Trial at Spindletop

Trt. No.	Product Name	Rate	Rate Unit	% Control		
				14 DAT	46 DAT	369 DAT
1	Fusion Activator 90	7 0.25	FL OZ/A % V/V	62 <i>cd</i>	65 <i>cdef</i>	43 <i>cd</i>
2	Fusion Activator 90	9 0.25	FL OZ/A % V/V	62 <i>cd</i>	75 <i>bcde</i>	33 <i>d</i>
3	Fusilade II Activator 90	6 0.25	FL OZ/A % V/V	25 <i>fgh</i>	37 <i>hij</i>	48 <i>cd</i>
4	Fusilade II Activator 90	12 0.25	FL OZ/A % V/V	37 <i>ef</i>	57 <i>efgh</i>	47 <i>cd</i>
5	Acclaim Extra Activator 90	20 0.25	FL OZ/A % V/V	53 <i>cde</i>	70 <i>bcdef</i>	28 <i>d</i>
6	Acclaim Extra Activator 90	39 0.25	FL OZ/A % V/V	68 <i>bc</i>	80 <i>abcd</i>	30 <i>d</i>
7	Acclaim Extra Fusilade II COC	7 14 1	FL OZ/A FL OZ/A % V/V	50 <i>de</i>	63 <i>defg</i>	63 <i>bc</i>
8	Outrider Activator 90	0.75 0.25	OZ/A % V/V	18 <i>gh</i>	43 <i>ghij</i>	67 <i>ab</i>
9	Outrider Activator 90	1 0.25	OZ/A % V/V	25 <i>fgh</i>	37 <i>hij</i>	82 <i>ab</i>
10	MSMA	32	FL OZ/A	87 <i>a</i>	78 <i>abcd</i>	97 <i>a</i>
11	Outrider MSMA	0.75 32	OZ/A FL OZ/A	83 <i>ab</i>	88 <i>ab</i>	96 <i>a</i>
12	Outrider Finale Activator 90	0.75 2 0.25	OZ/A QT/A % V/V	88 <i>a</i>	85 <i>abc</i>	63 <i>bc</i>
13	Roundup ProMax	22	FL OZ/A	87 <i>a</i>	98 <i>a</i>	87 <i>ab</i>
14	Clearcast MSO	32 1	FL OZ/A % V/V	17 <i>ghi</i>	30 <i>j</i>	45 <i>cd</i>
15	Plateau MSO	8 1	FL OZ/A % V/V	22 <i>fgh</i>	28 <i>j</i>	77 <i>ab</i>
16	Journey MSO	21.3 1	FL OZ/A % V/V	32 <i>fg</i>	52 <i>fghi</i>	83 <i>ab</i>
17	Pastora Activator 90	1 0.25	OZ/A % V/V	10 <i>hi</i>	35 <i>ij</i>	75 <i>ab</i>
18	Nontreated Check			0 <i>i</i>	0 <i>k</i>	0 <i>e</i>

Means within a column followed by the same letter are not different according to Fisher's Protected LSD at $P < 0.05$.

Non-Crop and Invasive Vegetation Management Weed Science
2013 Annual Research Report

Table 3: Treatments and Results for Johnsongrass Control Trial near Camp Nelson

Trt. No.	Product Name	Rate	Rate Unit	% Control		
				14 DAT	42 DAT	303 DAT
1	Fusion Activator 90	7 0.25	FL OZ/A % V/V	65 <i>a</i>	92 <i>ab</i>	60 <i>def</i>
2	Fusion Activator 90	9 0.25	FL OZ/A % V/V	65 <i>a</i>	95 <i>a</i>	77 <i>abcde</i>
3	Fusilade II Activator 90	6 0.25	FL OZ/A % V/V	65 <i>a</i>	88 <i>ab</i>	83 <i>abc</i>
4	Fusilade II Activator 90	12 0.25	FL OZ/A % V/V	65 <i>a</i>	91 <i>ab</i>	78 <i>abcd</i>
5	Acclaim Extra Activator 90	20 0.25	FL OZ/A % V/V	72 <i>a</i>	80 <i>bc</i>	72 <i>bcdef</i>
6	Acclaim Extra Activator 90	39 0.25	FL OZ/A % V/V	75 <i>a</i>	80 <i>bc</i>	70 <i>bcdef</i>
7	Acclaim Extra Fusilade II COC	7 14 1	FL OZ/A FL OZ/A % V/V	72 <i>a</i>	87 <i>abc</i>	72 <i>bcdef</i>
8	Outrider Activator 90	0.75 0.25	OZ/A % V/V	45 <i>b</i>	92 <i>ab</i>	55 <i>f</i>
9	Outrider Activator 90	1 0.25	OZ/A % V/V	42 <i>bc</i>	91 <i>ab</i>	77 <i>abcde</i>
10	MSMA	32	FL OZ/A	30 <i>bc</i>	50 <i>d</i>	65 <i>cdef</i>
11	Outrider MSMA	0.75 32	OZ/A FL OZ/A	45 <i>b</i>	73 <i>c</i>	88 <i>ab</i>
12	Outrider Finale Activator 90	0.75 2 0.25	OZ/A QT/A % V/V	75 <i>a</i>	86 <i>abc</i>	83 <i>abc</i>
13	Roundup ProMax	22	FL OZ/A	47 <i>b</i>	80 <i>bc</i>	57 <i>ef</i>
14	Clearcast MSO	32 1	FL OZ/A % V/V	32 <i>bc</i>	83 <i>abc</i>	82 <i>abc</i>
15	Plateau MSO	8 1	FL OZ/A % V/V	37 <i>bc</i>	92 <i>ab</i>	93 <i>a</i>
16	Journey MSO	21.3 1	FL OZ/A % V/V	30 <i>bc</i>	94 <i>a</i>	87 <i>ab</i>
17	Pastora Activator 90	1 0.25	OZ/A % V/V	25 <i>c</i>	80 <i>bc</i>	77 <i>abcde</i>
18	Nontreated Check			0 <i>d</i>	0 <i>e</i>	0 <i>g</i>

Means within a column followed by the same letter are not different according to Fisher's Protected LSD at $P < 0.05$.

Non-Crop and Invasive Vegetation Management Weed Science
2013 Annual Research Report

Table 4: Treatments and Results for Fescue Damage Trial at Spindletop

Trt. No.	Product Name	Rate	Rate Unit	Tall Fescue Color (0-9)		Stand (0-9)
				14 DAT	46 DAT	369 DAT
1	Fusion Activator 90	7 0.25	FL OZ/A % V/V	6.0 c	7.5 abc	8.7 a
2	Fusion Activator 90	9 0.25	FL OZ/A % V/V	6.0 c	7.0 bc	7.7 ab
3	Fusilade II Activator 90	6 0.25	FL OZ/A % V/V	6.3 bc	8.0 a	8.0 ab
4	Fusilade II Activator 90	12 0.25	FL OZ/A % V/V	6.3 bc	6.5 c	7.5 ab
5	Acclaim Extra Activator 90	20 0.25	FL OZ/A % V/V	6.8 abc	7.7 ab	8.0 ab
6	Acclaim Extra Activator 90	39 0.25	FL OZ/A % V/V	7.3 ab	7.5 abc	7.0 ab
7	Acclaim Extra Fusilade II COC	7 14 1	FL OZ/A FL OZ/A % V/V	7.0 abc	5.3 d	6.5 abc
8	Outrider Activator 90	0.75 0.25	OZ/A % V/V	6.3 bc	8.0 a	7.3 ab
9	Outrider Activator 90	1 0.25	OZ/A % V/V	7.0 abc	7.2 abc	7.5 ab
10	MSMA	32	FL OZ/A	7.0 abc	8.0 a	7.7 ab
11	Outrider MSMA	0.75 32	OZ/A FL OZ/A	6.3 bc	7.3 abc	8.0 ab
12	Outrider Finale Activator 90	0.75 2 0.25	OZ/A QT/A % V/V	1.0 e	7.5 abc	8.3 a
13	Roundup ProMax	22	FL OZ/A	0.8 e	0.5 g	4.0 c
14	Clearcast MSO	32 1	FL OZ/A % V/V	6.2 bc	2.0 ef	8.0 ab
15	Plateau MSO	8 1	FL OZ/A % V/V	6.0 c	5.3 d	8.0 ab
16	Journey MSO	21.3 1	FL OZ/A % V/V	4.0 d	1.7 f	4.0 c
17	Pastora Activator 90	1 0.25	OZ/A % V/V	6.3 bc	2.7 e	5.7 bc
18	Nontreated Check			8.0 a	8.0 a	9.0 a

Means within a column followed by the same letter are not different according to Fisher's Protected LSD at $P < 0.05$.