

2018 Johnsongrass Control Trial in Bowling Green (including 2019 Assessment)

Introduction

Johnsongrass (*Sorghum halepense*) is a perennial warm-season grass, listed as a noxious weed in Kentucky, that is a common problem on right-of-ways. There are a number of herbicides labeled and available to control johnsongrass on right-of-ways. However, some of these are nonselective or are selective for johnsongrass but can still damage desirable cool-season turf, such as tall fescue. One of the safer johnsongrass control herbicides to use on tall fescue is Fusion but a label change in 2012 made it unavailable for use on right-of-way sites. A range of herbicide options for johnsongrass control/suppression continued to be evaluated.

Materials and Methods

The objective was to evaluate early and late-season established trials at a site near Bowling Green, KY along the Natcher Parkway and Hwy 68 (Russellville Rd.) interchange. However, there was only enough area with a good stand of johnsongrass for one application timing. The area was mowed May 24, 2018 and the regrowth was treated June 8, 2018. The trial consisted of 18 treatments with 3 replications arranged in a randomized complete block design with 7 ft by 20 ft plots. Applications were made using a carrier volume of 30 gallons /acre. Johnsongrass vegetative growth was 32 inches tall and flowering plants (5% flowering) up to 43 inches tall at time of application. Johnsongrass control was assessed 25 days after treatment (DAT) (7/3/2018), 66 DAT (8/13/2018), 103 DAT (9/19/2018), 130 DAT (10/16/2018), and 390 DAT (7/3/2019). Data were analyzed using ARM research management software (GDM Solutions, Inc.) and treatment means were compared using Fisher's LSD at $p = 0.05$.

Table 1 lists the treatments, active ingredients and application rates. The previous 2011 Fusion label indicated rates for selective control of johnsongrass were 7 to 9 fl oz/A (Treatments 1 and 2). The labeled Fusilade II rates are 16 to 24 fl oz/A (Treatments 3 and 4). The Acclaim Extra label indicates 20 fl oz/A per acre to control seedling johnsongrass 12 to 24 inches tall (Treatment 5); 39 fl oz/A to control rhizome johnsongrass 24 to 60 inches tall (Treatment 6); and a combination of Acclaim Extra plus Fusilade II (7 and 14 fl oz/A, respectively), for improved turfgrass tolerance and to target rhizome johnsongrass 10 to 25 inches tall (Treatment 7). The Outrider label rates for selective johnsongrass control in tall fescue turf are 0.75 to 1 oz/A (Treatments 8 and 9). MSMA was applied alone (Treatment 10) and in combination with Outrider at 0.75 oz/A (Treatment 11). Clearcast (Treatment 12) has an aquatic label and may be used close to waterways. The high rate of Plateau (Treatment 13) can potentially damage tall fescue. Detail + Plateau was suggested as a combination (Treatment 14) for enhanced (faster) control of johnsongrass. The combination of Method + Detail + Plateau (Treatment 15) was designed to suppress johnsongrass growth, in areas such as behind guardrails. Roundup ProMax (Treatment 16) and Journey (Treatment 17) are non-selective herbicides.

Results and Discussion

By the time of the first rating 25 DAT some of the dead foliage had been dry for a while and there was already considerable regrowth on some plots (Table 2). Therefore, if earlier ratings had been taken the control for the MSMA plots (Treatment 10) would have been higher than 12% as the foliar damage was evident relatively quickly before the regrowth starts. The most effective group of treatments had 68 to 90% control. They included the high rate of Fusion (Treatment 2), both Fusilade II rates (Treatments 3 and 4), the Acclaim Extra + Fusilade II combination (Treatment 7), both rates of Outrider (Treatments 8 and 9), Clearcast (Treatment 12), both Plateau treatments (Treatments 13 and 14), Roundup (Treatment 16) and Journey (Treatment 17).

Control was observed at 78% with Roundup ProMax (Treatment 16) 25 DAT while it was 0% at subsequent assessment dates (Table 2). The regrowth was thicker and taller than the untreated control. There may not have been much glyphosate translocated to rhizome buds with this early season treatment timing, and subsequently dormant buds started growing after the existing culms were killed (McWhorter, 1972).

At 68 DAT the top group of treatments had 68 to 88% control and included the high rates of Fusion (Treatment 2) and Fusilade II (Treatment 4), the Acclaim Extra + Fusilade II combination (Treatment 7), both rates of Outrider (Treatments 8 and 9), both Plateau treatments (Treatments 13 and 14), and Journey (Treatment 17).

By 103 DAT some treatments had more regrowth and lower control ratings while some were slower acting and had higher % control (Table 2). The top group of treatments had 50 to 82% control and were the same as at 68 DAT but added the low rate of Fusion (Treatment 1), both rates of Acclaim Extra (Treatments 5 and 6), and the Outrider + MSMA combination (Treatment 11).

At the last rating of the 2018 season (130 DAT) 45 to 83% control was observed for the top group of treatments which were the same as at 103 DAT, except the low rate of Acclaim Extra (Treatment 5) was not high enough to be included with this group. The Method + Detail + Plateau combination (Treatment 15) did not have high control ratings but did reduce the growth of johnsongrass and might have utility in controlling growth in areas such as behind guardrails early in the season. The treatments showing aboveground control more quickly may not necessarily be the ones with the best long-term control.

Evaluations were also taken in 2019 at 390 DAT and the top group of treatments still provided 58 to 87% control. They included the high rates of Fusion (Treatment 2) and Fusilade II (Treatment 4), both rates of Acclaim Extra (Treatments 5 and 6), the Acclaim Extra + Fusilade II combination (Treatment 7), both rates of Outrider (Treatments 8 and 9), the Outrider + MSMA combination (Treatment 11), both Plateau treatments (Treatments 13 and 14), and Journey

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(Treatment 17). Most of the treatments showing good control at the end of the 2018 season continued to have good control ratings the following summer.

Literature Cited:

McWhorter, C.G. 1972. Factors affecting johnsongrass rhizome production and germination. *Weed Sci.* 20: 41-45.

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Table 1. Herbicide Treatments, Active Ingredients and Application Rates.

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	16 0.25	FL OZ/A % V/V	fluazifop	4 oz
4	Fusilade II Activator 90	24 0.25	FL OZ/A % V/V	fluazifop	6 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	Clearcast MSO	32 1	FL OZ/A % V/V	imazamox	4 oz ae
13	Plateau MSO	8 1	FL OZ/A % V/V	imazapic	2 oz ae
14	Detail Plateau MSO	1 8 1	FL OZ/A FL OZ/A % V/V	saflufenacil imazapic	0.36 oz 2 oz ae
15	Method Detail Plateau MSO	6 1 3 1	FL OZ/A FL OZ/A FL OZ/A % V/V	aminocyclopyrachlor saflufenacil imazapic	1.5 oz ae 0.36 oz 0.75 oz ae
16	Roundup ProMax	22	FL OZ/A	glyphosate	12.4 oz ae
17	Journey MSO	21.3 1	FL OZ/A % V/V	imazapic + glyphosate	2 oz ae + 4 oz ae
18	Nontreated Check				

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Table 2. Herbicide Treatments and Visual Control 25, 66, 103, 130, and 390 Days After Treatment (DAT)²

Trt. No.	Product Name	Rate	Rate Unit	25 DAT (July 3, 2018)	66 DAT (Aug 13, 2018)	103 DAT (Sept 19, 2018)	130 DAT (Oct 16, 2018)	390 DAT (July 3, 2019)
1	Fusion Activator 90	7 0.25	FL OZ/A % V/V	37 efg ¹	50 bcde	72 a	62 abc	45 cd
2	Fusion Activator 90	9 0.25	FL OZ/A % V/V	72 abc	72 abcd	77 a	70 ab	82 ab
3	Fusilade II Activator 90	16 0.25	FL OZ/A % V/V	68 abcd	27 ef	32 bcd	47 abcd	50 bcd
4	Fusilade II Activator 90	24 0.25	FL OZ/A % V/V	87 a	73 abcd	78 a	80 ab	85 a
5	Acclaim Extra Activator 90	20 0.25	FL OZ/A % V/V	47 cdef	45 cde	52 abc	42 bcd	68 abc
6	Acclaim Extra Activator 90	39 0.25	FL OZ/A % V/V	58 bcde	50 bcde	78 a	65 ab	58 abcd
7	Acclaim Extra Fusilade II COC	7 14 1	FL OZ/A FL OZ/A % V/V	83 ab	68 abcd	82 a	82 ab	78 ab
8	Outrider Activator 90	0.75 0.25	OZ/A % V/V	87 a	72 abcd	80 a	75 ab	85 a
9	Outrider Activator 90	1 0.25	OZ/A % V/V	85 ab	83 ab	82 a	83 a	78 ab
10	MSMA	32	FL OZ/A	12 gh	18 ef	22 cd	42 bcd	50 bcd
11	Outrider MSMA	0.75 32	OZ/A FL OZ/A	30 fg	50 bcde	50 abc	45 abcd	72 abc
12	Clearcast MSO	32 1	FL OZ/A % V/V	88 a	38 de	18 cd	17 de	28 de
13	Plateau MSO	8 1	FL OZ/A % V/V	85 ab	72 abcd	53 abc	60 abc	60 abcd
14	Detail Plateau MSO	1 8 1	FL OZ/A FL OZ/A % V/V	90 a	78 abc	63 ab	55 abcd	58 abcd
15	Method Detail Plateau MSO	6 1 3 1	FL OZ/A FL OZ/A FL OZ/A % V/V	40 def	20 ef	30 bcd	22 cde	12 e
16	Roundup ProMax	22	FL OZ/A	78 ab	0 f	0 d	0 e	10 e
17	Journey MSO	21.3 1	FL OZ/A % V/V	86 a	88 a	73 a	63 ab	87 a
18	Nontreated Check			0 h	0 f	0 d	0 e	0 e

¹ Means within a column followed by the same letter are not different according to Fisher's LSD at $P < 0.05$.

² Treatments applied June 8, 2018