2015 Johnsongrass Control x Mowing Timing Trial

Introduction

Johnsongrass (*Sorghum halepense*) is a perennial warm season grass, listed as a noxious weed in Kentucky (Kentucky Revised Statutes http://www.lrc.state.ky.us/KRS/176-00/051.PDF), and is a common problem on right-of-ways. There are a number of herbicides labeled and available to control johnsongrass on right-of-ways. A key to achieving high levels of johnsongrass control is translocation of the herbicide from the leaves to the rhizomes. However, routine mowing, as part of roadside management, could reduce johnsongrass control by removing leaf material along with the herbicide applied to it before translocation occurs. A practical question from managers is: "How long after a herbicide application do we need to wait before mowing without reducing herbicide efficacy on johnsongrass?" We repeated a study originally conducted in 2014 in 2015 to answer this question. Here we report the results collected in 2015 plus final control ratings taken in 2016.

Materials and Methods

The study was established August 24, 2015 at an interchange near Bardstown KY. Four herbicide treatments (Outrider [sulfosulfuron] 0.25 oz/A, Fusilade II [fluazifop] 6 oz/A, Acclaim Extra [fenoxaprop] 2.8 oz/A, and Acclaim Extra plus Fusilade II [0.5 and 3.5 oz/A] were applied to 10 ft x 60 ft strips. Applications were made at 30 gallons per acre carrier volume and included either a surfactant or a crop oil concentrate (Table 1). The herbicide treatments were applied when johnsongrass plants were, on average, 36 inches tall with a range from 30 to 48 inches. Six mowing treatments, the same day as herbicide treatment, one day after herbicide treatment (AHT), 2 days AHT, one week AHT, two weeks AHT, or no mowing (Table 2) were performed four times as 10 ft x 40 ft strips across the herbicide treatments in a split block design. Mowing height was 4 inches. Visual assessments of percent johnsongrass control were done 32 (9/25/2015), 45 (10/8/2015), 53 (10/16/2015), and 298 (6/17/2016) days after treatment (DAT). Data were analyzed using ARM software and treatment means were compared using Fisher's LSD at $p = 0.05$.

Results and Discussion

In this (2015) trial, regrowth of johnsongrass after mowing was slower than in 2014. One reason may be the timing of rainfall. There was 6.3 inches of rain in August 2014 but only 2.8 inches in August 2015 (long term rainfall average for August, for this region, is 3.5 inches). Environmental variability between years is one reason experiments should be conducted in more than one year. The data from the 2014 trial suggested that a 1 or 2 day mowing delay after Fusilade II and Fusilade II plus Acclaim Extra application or a 1 to 2 week mowing delay after Acclaim Extra treatment were necessary for best johnsongrass control (see 2015 report).

In this trial, 32 DAT all the unmowed plots had less control (76-80%) than the best control in the mowed plots (98-89%) (Table 3). Acclaim Extra mowed the same day as the application had less control than the other herbicide treatments that were mowed the same day as they were

applied. At 45 DAT, there were more symptoms on and control of the unmowed plots but not much new growth on the mowed plots (Table 4). The Acclaim Extra and the Acclaim + Fusilade plots mowed the same day had the lowest control ratings 53 DAT (Table 5).

Control of perennial weeds like johnsongrass requires a sustained effort and assessing herbicide efficacy requires assessments into the next growing season. Did the treatments suppress growth or did they control the plants? The next year (2016), 298 DAT, the growth between replications for individual treatments was very variable making it difficult to statistically separate treatment effects (Table 6). However, the Acclaim Extra treatment mowed the same day as application still had the lowest numerical control rating.

The results suggest there is no reason to change the recommendations based on the results of the trial started in 2014. These trials suggest that managers have more flexibility in timing with some products. However, you still want to wait a week or two after spraying Acclaim Extra before mowing.

Table 1. Herbicide Treatments and Active Ingredients for Mowing x Johnsongrass Control Trial

Treatment	Product Name	Rate	Rate Unit	Active Ingredient(s)	ai Rate (per acre)
1	Outrider Activator 90	1 0.25	OZ/A % V/V	sulfosulfuron	0.25 oz
2	Fusilade II Activator 90	24 0.25	FL OZ/A % V/V	fluazifop	6 oz
3	Acclaim Extra Activator 90	39 0.25	FL OZ/A % V/V	fexoxaprop	2.8 oz
4	Acclaim Extra Fusilade II COC	7 14 1	FL OZ/A FL OZ/A % V/V	fexoxaprop fluazifop	0.5 oz 3.5 oz

Table 2. Timing of Mowing Treatments

Treatment	Timing of Mowing Treatment
1	Same day as herbicide application
2	1 Day after herbicide application
3	2 Days after herbicide application
4	1 Week after herbicide application
5	2 Weeks after herbicide application
6	No Mowing

Table 3: Johnsongrass Control (%) 32 Days after Treatment in 2015

Mowing Time after Application	Outrider	Fusilade II	Acclaim Extra	Acclaim + Fusilade
Same day	89 *abcde*	89 *abcd*	84 *cdef*	86 *bcdef*
1 Day	94 *ab*	92 *abc*	97 *a*	95 *ab*
2 Days	95 *ab*	94 *abc*	97 *a*	95 *ab*
1 Week	95 *ab*	94 *abc*	95 *ab*	97 *a*
2 Weeks	97 *a*	95 *ab*	97 *a*	98 *a*
No Mowing	80 *def*	76 *f*	80 *def*	78 *ef*

[1]*Means followed by the same letter are not different according to Fisher's Protected LSD at P < 0.05.*

Table 4: Johnsongrass Control (%) 45 Days after Treatment in 2015

Mowing Time after Application	Outrider	Fusilade II	Acclaim Extra	Acclaim + Fusilade
Same day	90 *ab*[1]	90 *ab*	84 *b*	84 *b*
1 Day	90 *ab*	91 *ab*	92 *ab*	95 *a*
2 Days	92 ab	93 *ab*	94 *ab*	93 *ab*
1 Week	*96 a*	93 *ab*	93 *ab*	92 *ab*
2 Weeks	93 *ab*	93 *ab*	92 *ab*	87 *ab*
No Mowing	89 *ab*	89 *ab*	92 *ab*	84 *b*

[1]*Means followed by the same letter are not different according to Fisher's LSD at P < 0.05.*

Table 5: Johnsongrass Control (%) 53 Days after Treatment in 2015

Mowing Time after Application	Outrider	Fusilade II	Acclaim Extra	Acclaim + Fusilade
Same day	81 *abc*[1]	85 *abc*	72 *c*	75 *bc*
1 Day	83 *abc*	91 *a*	91 *a*	90 *ab*
2 Days	93 *a*	89 *ab*	90 *ab*	87 *ab*
1 Week	90 *ab*	86 *abc*	88 *ab*	93 *ab*
2 Weeks	87 *ab*	88 *ab*	89 *ab*	91 *a*
No Mowing	89 *ab*	87 *ab*	95 *a*	96 *a*

[1]*Means followed by the same letter are not different according to Fisher's LSD at P < 0.05.*

Table 6: Johnsongrass Control (%) 298 Days after Treatment in 2015

Mowing Time after Application	Outrider	Fusilade II	Acclaim Extra	Acclaim + Fusilade
Same day	48 *a*[1]	36 *ab*	13 *b*	21 *ab*
1 Day	38 *ab*	41 *ab*	21 *ab*	24 *ab*
2 Days	55 *a*	54 *a*	36 *ab*	48 *a*
1 Week	55 *a*	51 *a*	29 *ab*	29 *ab*
2 Weeks	51 *a*	50 *a*	36 *ab*	23 *ab*
No Mowing	50 *a*	38 *ab*	23 *ab*	23 *ab*

[1]*Means followed by the same letter are not different according to Fisher's LSD at P < 0.05.*