CRABGRASS CONTROL WITH VARIOUS TENACITY AND TENACITY TANK-MIXES, 2008.

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INTRODUCTION

Tenacity (mesotrione) is a relatively new herbicide that was released for use within CT in 2008. Although a primary strength of Tenacity will be the selective removal of creeping bentgrass from desirable turfgrass species such as Kentucky bluegrass, its use will likely expand beyond this. For instance, Tenacity has also shown to have pre- and/or postemergent properties against crabgrass, yellow nutsedge, buckhorn plantain, clover and other weed species. The objectives of this study are to assess the safety of Tenacity and new formulations of mesotrione and prodiamine when applied to a creeping red fescue lawn and to determine the level of pre and early post crabgrass control.

MATERIALS & METHODS

This study was conducted at the University of Connecticut Plant Science Research Facility located in Storrs, CT. Turf consisted of a monostand of 'Jasper' creeping red fescue maintained as a low maintenance home lawn. Mowing was performed approximately once per week to a height of 4.0 in. Plots measured 3 ft x 6 ft, and were arranged in a randomized complete block with four replications. All treatments were applied with a CO_2 pressurized (40 psi) sprayer equipped with a flat-fan nozzle, and calibrated to deliver 1.0 gal water per 1000 ft^2. All treatments and application dates are listed in the data tables.

Data collected included injury to the desirable fine leaf fescue species, percent crabgrass control and overall turf quality. Percent crabgrass was visually rated on a 0 to 100 scale where 0 = no crabgrass present in the plot and 100 = entire plot area covered with crabgrass. Overall quality of the 'Jasper' creeping red fescue was rated on a 1 to 9 scale where 1 = entire plot area brown or dead; 6.0 = minimum acceptable quality for a low maintenance home lawn; and 9 = optimum density and greenness. Injury to the fine leaf fescue turf was rated on a 0 to 5 scale and as a percent of the plot area exhibiting phytotoxic symptoms (rating methods explained in data tables). Percent clover was also assessed on several rating dates and rating scales were similar to that of crabgrass.

RESULTS

Percent Crabgrass. Crabgrass pressure was extremely low within the study site until approximately 4 to 5 inches of natural rainfall occurred between 23 and 24 Jul. Prior to this period, limited rainfall may have inhibited the emergence of crabgrass in the study site. When crabgrass was first rated on 1 Aug, all numbered compound-treated plots had less than 1% crabgrass (Table 1). Moderate suppression was provided within plots treated with Dimension. This trend continued until the final rating date on Sep 8 when excellent (≤ 1%) suppression of crabgrass was observed within plots treated with A15879 on either 3 Jun or those receiving sequential applications of mesotrione and or prodiamine. On 8 Sep, moderate but unacceptable suppression of crabgrass was afforded by all Dimension treatments.

Turfgrass Injury. Injury to the fine leaf fescue in this study was highly variable and few differences were observed among treatments. Percent phytotoxicity ratings generally were indicative of discoloration and thinning to the stand and difference were not observed among any treatments until conditions became warm and dry in early Jul (Table 2). It appeared that all treatments receiving any of the numbered compounds applied alone or in combination had the greatest level of injury, but few differences among treatments were observed. When injury was rated on a 0 to 5 scale (indicating the severity of the injury to plants), few differences were observed and no differences were observed when injury ratings were at their highest on 26 May (Table 3).

Quality and Clover. Quality and clover ratings were highly variable and few differences were observed on any rating date. Despite few differences, various treatments resulted in a reduction in turf quality on several rating dates (Table 4). In general, plots received applications of Dimension generally had the highest quality ratings throughout the study. While

most treatments had quality levels that would be considered acceptable for a low maintenance fine leaf fescue lawn (≥6.0), plots treated with A15879 (0.38 lb) + A12738 (0.125 lb) had quality below the acceptable threshold on 4 of 6 rating dates. Percent plot area infested with clover was erratic and no treatments provided acceptable suppression of white clover by the final rating date (Table 5).

DISCUSSION

Crabgrass pressure in this study was considered low and the populations were slow to develop due to inadequate soil moisture and lack of rainfall until late Jul. Despite this, several treatments involving multiple applications of mesotrione and/or barricade provided excellent control of crabgrass during the study. Although plots receiving A15879 or A12738 + A123333 on 11 May continued to provide adequate suppression of crabgrass on the final rating date, it is likely that an increase in tillering would have resulted in an unacceptable level of crabgrass pressure in a highly maintained lawn. Results from this year's evaluations may represent those of an outlier in that irrigation was limited until late in the season and therefore likely resulted in a late, but large flush of emergence of crabgrass seedlings. Future research may investigate the influence of a wider range of application timings on crabgrass control. Additionally, it may be prudent to evaluate the influence of these products on crabgrass control on a more highly maintained lawn or athletic field under different irrigation practices as well as varying turfgrass species.

Table 1. Percent crabgrass in a fine leaf fescue lawn following the application of various Tenacity and Prodiamine tank-mixes, 2008

Treatment and rate in ai/a	Application[z] timing	Percent crabgrass[x] 1 Aug	15 Aug	8 Sep
A15879 1.0 lb	A	<1 d	<1 c	2 d
A12738 0.25 lb + A12333 0.75 lb	A	<1 d	1 c	3 d
Dimension 2EW 0.25 lb	A	6 b	8 b	19 b
A15879 1.0 lb + Activator 0.25 % v/v	B	<1 d	<1 c	1 d
Dimension 2EW 0.25 lb + Activator 0.25 % v/v	B	3 c	4 c	10 c
A15879 0.38 lb +	A			
A12738 0.125 lb +Activator 0.25 % v/v	C	<1 d	<1 c	1 d
A12738 0.125 lb + A12333 0.38 lb	AC			
Activator 0.25 % v/v	C	0 d	0 c	<1 d
A15879 0.5 lb +	AC			
Activator 0.25 % v/v	C	<1 d	<1 c	<1 d
Dimension 2EW 0.25 lb +	A			
Acclaim 120EC 20 fl oz + Activator 0.25 % v/v	C	3 c	3 c	10 c
Untreated	-	13 a	21 a	34 a

[z] Treatments were applied as follows: A=11 May, B = 3 Jun, and C= 25 Jun.

[x] Percent of the plot area with Phytotoxicity was visually rated on a 0 to 100 percent scale where 0 = no phyto was present or 100 = entire plot has phyto.

[y] Percent of the plot area infected with crabgrass was visually rated on a 0 to 100 percent scale where 0 = no crabgrass was present or 100 = entire plot was covered in crabgrass.

[w] Means in a column followed by the same letter are not significantly different at P≤0.05 level according to the Fisher's protected least significant difference t-test.

Table 2. Percent phytotoxicity of a fine leaf fescue lawn following treatment with various Tenacity and Prodiamine tank-mixes, 2008.

	Application[z]	Percent phytotoxicity[y]			
Treatment and rate in ai/a	timing	26 May	9 Jun	20 Jun	3 Jul
A15879 1.0 lb	A	26 a[w]	20 a	29 a	26 ab
A12738 0.25 lb + A12333 0.75 lb	A	29 a	19 a	26 a	25 ab
Dimension 2EW 0.25 lb	A	30 a	14 a	16 a	13 bcd
A15879 1.0 lb + Activator 0.25 % v/v	B	23 a	9 a	21 a	15 a-d
Dimension 2EW 0.25 lb + Activator 0.25 % v/v	B	26 a	6 a	15 a	13 bcd
A15879 0.38 lb +	A				
A12738 0.125 lb +Activator 0.25 % v/v	C	38 a	25 a	34 a	30 a
A12738 0.125 lb + A12333 0.38 lb	AC				
Activator 0.25 % v/v	C	29 a	19 a	26 a	20 abc
A15879 0.5 lb +	AC				
Activator 0.25 % v/v	C	21 a	8 a	19 a	18 a-d
Dimension 2EW 0.25 lb +	A				
Acclaim 120EC 20 fl oz + Activator 0.25 % v/v	C	17 a	3 a	10 a	5 cd
Untreated	-	25 a	9 a	9 a	4 d

[z] Treatments were applied as follows: A=11 May, B = 3 Jun, and C= 25 Jun.

[x] Percent of the plot area with Phytotoxicity was visually rated on a 0 to 100 percent scale where 0 = no phytotoxicity present or 100 = entire plot exhibiting phytotoxic symptoms.

[y] Percent of the plot area infected with crabgrass was visually rated on a 0 to 100 percent scale where 0 = no crabgrass was present or 100 = entire plot was covered in crabgrass.

[w] Means in a column followed by the same letter are not significantly different at P≤0.05 level according to the Fisher's protected least significant difference t-test.

Table 3. Injury to a fine leaf fescue lawn following the application of various Tenacity and Prodiamine tank-mixes, 2008.

	Application[z]	Injury[y]			
Treatment and rate in ai/a	timing	26 May	9 Jun	20 Jun	3 Jul
A15879 1.0 lb	A	1.8 a[x]	1.5 a	0.3 bc	0.8 bc
A12738 0.25 lb + A12333 0.75 lb	A	2.0 a	1.3 a	0.3 bc	0.8 bc
Dimension 2EW 0.25 lb	A	1.8 a	0.8 a	0.0 c	0.0 c
A15879 1.0 lb + Activator 0.25 % v/v	B	2.0 a	0.5 a	1.0 a	0.0 c
Dimension 2EW 0.25 lb + Activator 0.25 % v/v	B	1.8 a	0.5 a	0.0 c	0.0 c
A15879 0.38 lb +	A				
A12738 0.125 lb +Activator 0.25 % v/v	C	2.8 a	2.3 a	1.0 a	1.8 a
A12738 0.125 lb + A12333 0.38 lb	AC				
Activator 0.25 % v/v	C	2.3 a	0.8 a	0.5 abc	0.8 bc
A15879 0.5 lb +	AC				
Activator 0.25 % v/v	C	2.0 a	5.0 a	0.8 ab	1.5 ab
Dimension 2EW 0.25 lb +	A				
Acclaim 120EC 20 fl oz + Activator 0.25 % v/v	C	0.8 a	0.0 a	0.0 c	0.0 c
Untreated	-	1.8 a	0.5 a	0.0 c	0.0 c

[z] Treatments were applied as follows: A=11 May, B = 3 Jun, and C= 25 Jun.

[y] Turfgrass injury was rated on a 0 to 5 scale where 0 = no injury visible and 5 = entire plot brown or dead.

[x] Means in a column followed by the same letter are not significantly different at P≤0.05 level according to the Fisher's protected least significant difference t-test.

Table 4. Quality of a fine leaf fescue lawn following the treatment of various Tenacity and Prodiamine tank-mixes, 2008.

Treatment and rate in ai/a	Application[z] timing	Quality[y] 9 Jun	20 Jun	3 Jul	20 Jul	1 Aug	15 Aug
A15879 1.0 lb	A	6.8 a[x]	5.0 a	6.0 cd	7.0 a	6.0 b	6.8 a
A12738 0.25 lb + A12333 0.75 lb	A	6.5 a	5.0 a	6.3 bcd	6.5 a	6.0 b	6.8 a
Dimension 2EW 0.25 lb	A	7.0 a	6.0 a	7.5 ab	7.0 a	7.3 a	7.0 a
A15879 1.0 lb + Activator 0.25 % v/v	B	7.0 a	5.3 a	7.3 abc	7.0 a	6.8 ab	7.0 a
Dimension 2EW 0.25 lb + Activator 0.25 % v/v	B	7.5 a	6.0 a	7.5 ab	6.8 a	7.3 a	7.0 a
A15879 0.38 lb +	A						
A12738 0.125 lb +Activator 0.25 % v/v	C	5.8 a	4.0 a	5.0 d	6.5 a	5.8 b	6.3 a
A12738 0.125 lb + A12333 0.38 lb	AC						
Activator 0.25 % v/v	C	6.3 a	5.0 a	6.0 cd	6.0 a	5.8 b	6.0 a
A15879 0.5 lb +	AC						
Activator 0.25 % v/v	C	7.3 a	5.5 a	6.5 abc	7.3 a	6.3 ab	7.3 a
Dimension 2EW 0.25 lb +	A						
Acclaim 120EC 20 fl oz + Activator 0.25 % v/v	C	7.8 a	7.0 a	7.5 ab	7.5 a	7.3 a	7.5 a
Untreated	-	6.8 a	7.0 a	7.8 a	7.8 a	7.3 a	7.5 a

[z] Treatments were applied as follows: A=11 May, B = 3 Jun, and C= 25 Jun.

[y] Quality was rated visually on 0-9 scale where 0 = entire plot brown or dead; 6 = minimum acceptable quality for a fine leaf fescue lawn; and 9 = optimum color and density.

[x] Means in a column followed by the same letter are not significantly different at P≤0.05 level according to the Fisher's protected least significant difference t-test.

Table 5. Percent white clover in a fine leaf fescue lawn following the application of various Tenacity and Prodiamine tank-mixes, 2008.

Treatment and rate in ai/a	Application[z] timing	Percent clover[x] 20 Jun	20 Jul	1 Aug	15 Aug	8 Sep
A15879 1.0 lb	A	3 e	4 d	6 d	5 a	7 a
A12738 0.25 lb + A12333 0.75 lb	A	5 de	12 bcd	12 bcd	15 a	18 a
Dimension 2EW 0.25 lb	A	22 abc	34 ab	34 ab	26 a	23 a
A15879 1.0 lb + Activator 0.25 % v/v	B	12 b-e	25 a-d	28 abc	30 a	31 a
Dimension 2EW 0.25 lb + Activator 0.25 % v/v	B	19 a-d	31 abc	35 a	35 a	39 a
A15879 0.38 lb +	A	6 de	7 cd	8 cd	7 a	9 a
A12738 0.125 lb +Activator 0.25 % v/v	C					
A12738 0.125 lb + A12333 0.38 lb	AC	9 cde	11 bcd	13 bcd	12 a	14 a
Activator 0.25 % v/v	C					
A15879 0.5 lb +	AC	10 b-e	8 cd	10 cd	10 a	12 a
Activator 0.25 % v/v	C					
Dimension 2EW 0.25 lb +	A	30 a	42 a	45 a	28 a	28 a
Acclaim 120EC 20 fl oz + Activator 0.25 % v/v	C					
Untreated	-	24 ab	48 a	42 a	33 a	31 a

[z] Treatments were applied as follows: A=11 May, B = 3 Jun, and C= 25 Jun.

[y] Percent of the plot area infected with crabgrass was visually rated on a 0 to 100 percent scale where 0 = no crabgrass was present or 100 = entire plot was covered in crabgrass.

[w] Means in a column followed by the same letter are not significantly different at P≤0.05 level according to the Fisher's protected least significant difference t-test.