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Abstract

Windmillgrass (*Chloris verticillata* Nutt.) populations commonly infest turfgrass systems in the midwest, which result in aesthetically unacceptable turfgrass stands. Research trials were initiated in 2017 and 2018, in Onaga and Junction City, KS, to determine windmillgrass control with various single herbicide applications at different application timings. Pylex (topramezone) resulted in more than 80% windmillgrass control 8 weeks after spring and summer application.

Keywords

windmillgrass, weed control, herbicide efficacy, herbicide timing

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Herbicide and Application Timing Effects on Windmillgrass (*Chloris verticillata*) Control

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Summary

Windmillgrass (*Chloris verticillata* Nutt.) populations commonly infest turfgrass systems in the midwest, which result in aesthetically unacceptable turfgrass stands. Research trials were initiated in 2017 and 2018, in Onaga and Junction City, KS, to determine windmillgrass control with various single herbicide applications at different application timings. Pylex (topramezone) resulted in more than 80% windmillgrass control 8 weeks after spring and summer application.

Rationale

Windmillgrass is a problematic perennial grassy weed commonly found in established turfgrass in the midwest. Currently, mesotrione and topramezone (4-hydroxyphenylpyruvate dioxygenase [HPPD] inhibitor) are the only available labeled post-emergent active ingredients for windmillgrass control in turfgrass systems.

Objective

The objective of this study was to determine the effect of a single post-emergent herbicide application and optimal application timing for windmillgrass control.

Study Description

Research trials were initiated in 2017 in Onaga and Junction City, KS, to determine windmillgrass herbicide efficacy as well as application timing to provide windmillgrass control. Windmillgrass populations consisted of 65–75% cover in a low maintenance tall fescue (*Schedonorus arundinaceus*) system maintained at 2.5 inches. No supplemental irrigation was applied to the research areas throughout the duration of the trials. Treatments were arranged in a 3 × 10 factorial, randomized complete

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block design with 4 replications. Factors were the combination of 3 application timings (spring, summer, and fall) and 10 herbicides. Summer treatments were applied on July 14, 2017, in Junction City, KS, and on July 19, 2017, in Onaga, KS. The fall treatments were applied on September 7, 2017, in Junction City, KS, and on September 15, 2017, in Onaga, KS. The spring treatments were applied on May 24, 2018, in Junction City, KS, and May 25, 2018, in Onaga, KS. Herbicide treatments consisted of Tenacity (mesotrione) at 8 fl oz/a, Acclaim (fenoxaprop) at 39 fl oz/a, Pylex (topramezone) at 2 fl oz/a, Drive XLR8 (quinclorac) at 64 fl oz/a, Dismiss (sulfentrazone) at 8 fl oz/a, Revolver (foramsulfuron) at 32.5 fl oz/a, Celsius WG (thiencarbazone + iodosulfuron + dicamba) at 4.9 oz/a, Katana (flazasulfuron) at 3 oz/a, Monument 75WG (trifloxysulfuron) at 0.53 oz/a, and a nontreated control. A surfactant was added to each herbicide treatment according to the manufacturer's directions. Herbicide treatments were applied using a CO_2 pressurized backpack boom sprayer calibrated to deliver 43.56 GPA at 37 psi. Data collected for research trials consisted of visual percent windmillgrass cover (0–100%). Evaluations were conducted weekly for 4 weeks and then biweekly to 8 weeks after each application. Analysis of variance (ANOVA) was performed in SAS 9.4 (SAS Institute Inc., Cary, NC) and means were separated according to Fisher's protected least significant difference (LSD) level at 0.05.

Results

Pylex (topramezone) applied at 2 fl oz/a in the spring and summer resulted in 83% and 81% windmillgrass control at 8 weeks after treatment, respectively. Spring and summer applications of Pylex at Rolling Meadows resulted in much greater control compared to the fall application. Drive (quinclorac), Dismiss (sulfentrazone), Revolver (foramsulfuron), Celsius (thiencarbazone + iodosulfuron + dicamba), Katana (flazasulfuron), and Monument (trifloxysulfuron) resulted in unacceptable windmillgrass control (≤13%) with spring and summer applications at both research locations. No herbicides tested in this study applied in the spring, summer, or fall with a single application resulted in acceptable windmillgrass control.

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Table 1. Windmillgrass control by various herbicide treatments following spring, summer, and fall applications in Junction City, KS

	Application timing[a]		
	Spring	Summer	Fall
Herbicide Treatment	% Control[d]		
Tenacity	15 bc[b], B[c]	9 bc, B	43 a, A
Acclaim	31 b, A	30 b, A	43 a, A
Pylex	83 a, A	81 a, A	54 a, B
Drive	9 c, B	0 c, B	47 a, A
Dismiss	0 c, B	0 c, B	35 ab, A
Revolver	4 c, B	0 c, B	43 a, A
Celsius	5 c, B	0 c, B	34 abc, A
Katana	4 c, A	0 c, A	15 bc, A
Monument	13 bc, A	0 c, A	11 c, A

[a]Ratings were done 8 weeks after each application: July 19, 2018 (spring), September 7, 2017 (summer), and November 2, 2017 (fall).
[b]Treatment means followed by a common lowercase letter are not significantly different within application timing according to Fisher's protected LSD ($\alpha = 0.05$).
[c]Treatment means followed by a common capital letter are not significantly different within active ingredient according to Fisher's protected LSD ($\alpha = 0.05$).
[d]Non-treated control contained 50, 65, and 45% windmillgrass cover at 8 weeks after treatment for spring, summer, and fall application timings, respectively. % Control = [(A-B)/A] × 100, A = % windmillgrass cover at applications and B = % windmillgrass cover 8 weeks after application.

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