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Herbicide and Application Timing Effects on Windmillgrass Control

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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 in Onaga and Junction City, KS, to determine windmillgrass control with various single herbicide applications at multiple application timings (spring, summer, and fall). Data collection for research trials consisted of visual percent windmillgrass cover (0–100%), line intersect analysis on four-inch spacing, normalized difference vegetation index (NDVI) (0 to 1 scale), and windmillgrass seedhead counts. Initial observations resulted in greater windmillgrass control with summer applications compared to fall applications. Pylex (topramezome) resulted in 80% windmillgrass control 8 weeks after summer application. Initial results indicate alternative herbicides options for windmillgrass control.

Keywords

windmillgrass, weed control, herbicide efficacy, herbicide timing

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Herbicide and Application Timing Effects on Windmillgrass 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 in Onaga and Junction City, KS, to determine windmillgrass control with various single herbicide applications at multiple application timings (spring, summer, and fall). Data collection for research trials consisted of visual percent windmillgrass cover (0–100%), line intersect analysis on four-inch spacing, normalized difference vegetation index (NDVI) (0 to 1 scale), and windmillgrass seedhead counts. Initial observations resulted in greater windmillgrass control with summer applications compared to fall applications. Pylex (topramezome) resulted in 80% windmillgrass control 8 weeks after summer application. Initial results indicate alternative herbicides options for windmillgrass control.

Rationale

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

Objective

Identify additional active ingredients and application timing for windmillgrass control in turfgrass with single applications.

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Study Description

Research trials were initiated in 2017 in Onaga and Junction City, KS, to determine windmillgrass herbicide efficacy as well as application timing on windmillgrass control. Windmillgrass populations consisted of 65-75% cover in a low maintenance tall fescue (*Schedonorus arundinaceus*) system. Research plots were 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 block design with 4 replications. Factors were the combination of 3 applications timings (spring, summer, and fall) and 10 herbicides. Summer treatments were applied on July 14, 2017 in Junction City and on July 19, 2017 in Onaga. The fall treatments were applied on September 7, 2017 in Junction City, and on September 15, 2017 in Onaga. Spring applications were applied in May 2018. 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 (thiencarbzaone + 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. Herbicide treatments were applied using a CO_2 pressurized backpack boom sprayer calibrated to deliver 43.56 GPA at 37 psi. Data collection for research trials consisted of visual percent windmillgrass cover (0-100%), line intersect analysis on four-inch spacing, NDVI (0 to 1 scale) and windmillgrass seedhead counts. Evaluations were conducted weekly for 4 weeks then biweekly up 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

Initial observations calculated from percent windmillgrass cover resulted in increased windmillgrass control by summer applications compared to fall timings, pooled over all herbicide treatments (data not shown). At 8 weeks after summer application Pylex (topramezone) resulted in effective windmillgrass control (80%) (Figure 1). Acclaim (fenoxaprop) performed similarly to the currently labeled control option, Tenacity (mesotrione), at 8 weeks after summer application. Research is ongoing.

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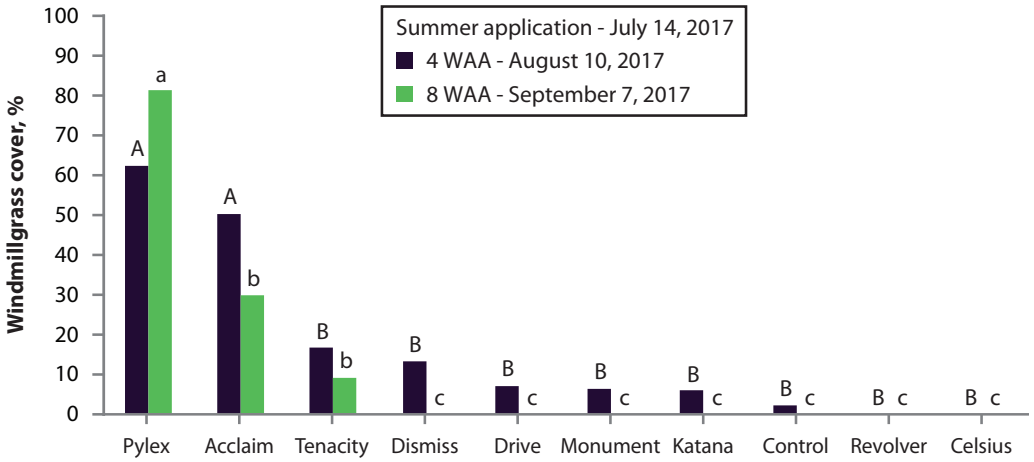

Figure 1. Windmillgrass control by various herbicide treatments following summer application in Junction City, KS, Rolling Meadows Golf Course.
% Control = [(Initial-X)/Initial] *100
X = % Windmillgrass cover for that rating date.
WAA = weeks after application.
Means were separated according to Fisher's protected least significant difference (LSD) level at 0.05.

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