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Winter Annual Grass Control in Winter Wheat

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Abstract

Winter annual grasses can be difficult to manage in winter wheat. A field experiment was established near Manhattan, KS, in 2016 to evaluate various preemergence and postemergence herbicide treatments for control of downy brome, cheat, and feral rye. Most treatments were less effective for control of downy brome than cheat. Preemergence and fall postemergence treatments provided better downy brome control than spring postemergence treatments. All herbicide treatments evaluated provided excellent control of cheat, but postemergence treatments were slightly better than preemergence treatments. The only herbicide to control rye was Beyond, which provided better control when applied fall postemergence than spring postemergence.

Keywords

Wheat, downy brome, cheat, rye

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Winter Annual Grass Control in Winter Wheat

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Summary

Winter annual grasses can be difficult to manage in winter wheat. A field experiment was established near Manhattan, KS, in 2016 to evaluate various preemergence and postemergence herbicide treatments for control of downy brome, cheat, and feral rye. Most treatments were less effective for control of downy brome than cheat. Preemergence and fall postemergence treatments provided better downy brome control than spring postemergence treatments. All herbicide treatments evaluated provided excellent control of cheat, but postemergence treatments were slightly better than preemergence treatments. The only herbicide to control rye was Beyond, which provided better control when applied fall postemergence than spring postemergence.

Introduction

Winter annual grasses are difficult to manage in winter wheat because of the similarities in biology and life cycle. Several herbicide treatments are registered to control winter annual grasses in wheat, but control can vary depending on grass species, application timing and environmental conditions.

Procedures

A field experiment was established near Manhattan, KS, on a Reading silt loam soil with 2.4% organic matter and a pH of 6.5. Downy brome, cheat, and rye seed were spread in strips across the plot area and incorporated with a field cultivator prior to seeding wheat. DoubleStop CL Plus (2-gene Clearfield) hard red winter wheat was seeded at a rate of 60 lb/a with a double-disk drill on October 5, 2015. Preemergence (PRE) herbicide treatments were applied to the soil surface the same day as wheat was planted at 61°F, with 75% relative humidity and overcast skies. The first precipitation event following planting totaled 0.61 inches on October 30. Fall postemergence (FP) treatments were applied to 3-leaf and 2-tiller wheat, 1-leaf downy brome, 1-leaf cheat, and 3-leaf, 2-tiller rye on November 10, with 52°F, 64% relative humidity, and partly cloudy skies. Spring postemergence (SP) treatments were applied to multi-tillered wheat, downy brome, cheat, and rye on March 10 at 69°F, with 38% relative humidity and mostly clear skies. Treatments were applied with a CO₂ back-pack sprayer, delivering 15 GPA at 35 psi through AIXR110015 flat fan spray tips to the center 6.3 ft of 15 by 28 ft plots. The experiment had a randomized complete block design with three replications. Wheat injury and grass control were visually evaluated throughout the growing season and wheat was harvested from the center 5 ft of the plots on June 22.

Results

None of the herbicide treatments caused any significant crop injury (data not presented). Minimal downy brome and cheat germinated prior to the first rain, and consequently, PRE treatments generally provide good control of both species, which was comparable to most FP treatments. Preemergence Zidua and Anthem Flex tended to provide a little better control of downy brome than preemergence Olympus. Fall postemergence treatments provided better downy brome control than comparable spring postemergence treatments. All postemergence treatments provided complete control of cheat, which was slightly better than preemergence treatments. The only treatments to control rye were the Beyond treatments. Rye control with Beyond was better with fall than spring postemergence applications. Wheat yields were not different among treatments (data not presented).

Table 1. Winter annual grass control in winter wheat on May 31, 2016, Manhattan, KS

Treatment*	Application timing	Application rate oz/a	Downy brome ----- % control -----	Cheat ----- % control -----	Rye ----- % control -----
Olympus	PRE	0.6	87	96	0
Zidua	PRE	1.5	93	95	0
Anthem Flex	PRE	3	94	94	0
Olympus+NIS	FP	0.9	96	100	0
PowerFlex HL+NIS	FP	2	91	100	0
Beyond+MSO+UAN	FP	4	96	100	100
Olympus+NIS	SP	0.9	81	100	0
PowerFlex HL+NIS	SP	2	79	100	0
Beyond+MSO+UAN	SP	4	80	100	81
Olympus/Olympus+NIS	PRE/SP	0.6/0.6	89	100	0
Zidua/PowerFlex HL+NIS	PRE/SP	1.5/2	90	100	8
Olympus+NIS/Olympus+NIS	FP/SP	0.9/0.3	95	100	0
Least significant difference ($P < 0.05$)			7	3	4

* NIS = nonionic surfactant applied at 0.25% v/v; MSO = methylated seed oil applied at 1% v/v; UAN = 28% liquid urea ammonium nitrate applied at 10% v/v; / indicates sequential applications; PRE = preemergence; FP = fall postemergence; and SP = spring postemergence.