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Postemergence Weed Control with Diflexx, Diflexx Duo, Capreno, and Atrazine in Corn Resistant to Glufosinate and Glyphosate

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Summary

A study was initiated near Garden City, KS, in 2016, comparing the weed control of several postemergence herbicide treatments in irrigated corn. Control of kochia, Palmer amaranth, and crabgrass was 96% or more effective with all herbicides at 7 days after treatment (DAT). By 62 DAT, control of these three weed species was generally best when glyphosate, atrazine, Diflexx (dicamba) or Clarity (dicamba) were included in the herbicide mixture. Although all herbicide tank mixes increased yield compared to the untreated plots, no tank mix resulted in a superior yield.

Introduction

Capreno (thiencarbazone + tembotrione), Diflexx, Diflexx Duo (dicamba + tembotrione), and Halex GT (metolachlor + glyphosate + mesotrione) have been shown to provide good weed control. With the advent of glyphosate-resistant weeds, information is needed on how to augment the weed control of these compounds with Liberty 280 (glufosinate). Therefore, it was the objective of this study to compare various tank mixes to measure their impact on weed control in irrigated glufosinate-resistant corn.

Experimental Procedures

An experiment conducted at the Kansas State University Southwest Research-Extension Center near Garden City, KS, evaluated early postemergence weed control in corn with resistance to glufosinate and glyphosate. The entire plot area was over-seeded with foxtail, crabgrass, and Palmer amaranth, as well as the domestically cultivated sorghum 'Rox orange,' quinoa and sunflowers. These serve as proxies for their wild relatives, shattercane, lambsquarters, and wild sunflowers, respectively. All treatments were applied on June 17, 2016, when corn had two true leaves. A tractor-mounted, compressed-CO_2 sprayer delivering 20 GPA at 3.0 mph and 30 psi was used to apply all treatments. Plots were 10- by 35-feet and arranged in a randomized complete block design with four replications. Soil was a Ulysses silt loam with pH of 8.0, 1.4% organic matter, and cation exchange capacity of 18.4. Weed control was determined visually on June 24 and August 18, 2016, which was 7 and 62 days after treatment (DAT), respectively. Corn yield was determined October 3, 2016, by mechanically harvesting the center two rows of each plot and adjusting grain weights to 15.5% moisture.

Results and Discussion

All herbicides controlled quinoa 100% regardless of the evaluation date (data not shown). Control of kochia, Palmer amaranth, and crabgrass was 96% or more effective with all herbicides at 7 DAT. By 62 DAT, control of these three weed species was generally best when glyphosate, atrazine, Diflexx, or Clarity were included in the herbicide mixture. Herbicide-treated corn yielded 40 to 66 bu/a more grain than untreated corn, but yields did not differ between any herbicide treatment. Most of these treatments provided excellent weed control. However, glufosinate has no residual grass or broadleaf efficacy, and its control can be extended with the addition of herbicides with residual activity.

Table 1. Postemergence herbicides in resistant corn

		Palmer amaranth		Green foxtail		Crabgrass		
Treatment[a]	Rate	7 DAT[b]	62 DAT	7 DAT	62 DAT	7 DAT	62 DAT	Corn yield
	per a	% control						bu/a
Halex GT Diflexx Atrazine NIS AMS	3.6 pt 8 oz 32 oz 0.25% 2 lb	100	99	100	99	100	98	117.1
Liberty 280 Diflexx Duo Atrazine AMS	29 oz 24 oz 32 oz 3 lb	100	91	100	89	100	76	113.4
Liberty 280 Capreno AMS	29 oz 3 oz 3 lb	96	85	100	91	98	86	113.6
Glyphosate Capreno Atrazine Clarity Superb HC AMS	32 oz 3 oz 32 oz 8 oz 0.5% 2 lb	100	94	100	98	99	91	139.5
Untreated	---	0	0	0	0	0	0	73.1
LSD (0.05)		1	5	NS	6	3	8	26.7

[a] AMS is ammonium sulfate and NIS is nonionic surfactant.
[b] DAT is days after herbicide treatment.
LSD = Least significant difference.

Figure 1. Untreated control.

Figure 2. Halex GT 3.6 pt + Diflexx 8 oz + atrazine 32 oz postemergence, 20 days after application.

Figure 3. Liberty 29 oz + Diflexx Duo 24 oz + atrazine 32 oz postemergence, 20 days after application.

Figure 4. Liberty 29 oz + Capreno 3 oz postemergence, 20 days after application.

Figure 5. Glyphosate 32 oz + Capreno 3 oz + atrazine 32 oz + Clarity 8 oz postemergence, 20 days after application.