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Preemergence and Early Postemergence Weed Control with Instigate, Glyphosate, Realm Q, Atrazine, Dicamba, Corvus, Acuron, and Resicore in Irrigated Corn

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Preemergence and Early Postemergence Weed Control with Instigate, Glyphosate, Realm Q, Atrazine, Dicamba, Corvus, Acuron, and Resicore in Irrigated Corn

R.S. Currie and P.W. Geier

Summary

Palmer amaranth, kochia, quinoa, common sunflower, and green foxtail control was excellent with most treatments. Crabgrass control was also good with most treatments. Crabgrass control with Realm Q (rimsulfuron + mesotrione) + atrazine, dicamba, and glyphosate; and with Corvus (isoxaflutole + thiencarbazone) + atrazine, dicamba, and glyphosate was slightly less by 73 DAPT. The exceptional weed control with these herbicides resulted in grain yields that were 108 to 125 bu/a greater than in the untreated plots. However, there were no differences among herbicide treatments for corn yield.

Introduction

Mesotrione, a key component of Acuron (*S*-metolachlor + atrazine + mesotrione + bicyclopyrone), has recently come off patent, allowing it to be used in several novel premixes such as Instigate (rimsulfuron + mesotrione), Realm Q, and Resicore (acetochlor + clopyralid + mesotrione). Corvus has a different mode of action than these compounds and is commercially competitive with them. Many of these premixes can be augmented by adding Cinch ATZ (*S*-metolachlor + atrazine), glyphosate, atrazine, or dicamba. Therefore, it was the objective of this study to compare the weed control of these herbicides at preemergence and postemergence application timings.

Experimental Procedures

An experiment at the Kansas State University Southwest Research-Extension Center near Garden City, KS, evaluated residual weed control with herbicides applied preemergence (PRE) or early postemergence (EPOST) when corn had one to two true leaves. The experimental area was overseeded with Palmer amaranth, kochia, crabgrass, quinoa, and domesticated sunflower seed prior to corn planting. Quinoa and domesticated sunflower were used as surrogates for common lambsquarters and common sunflower. All herbicides were applied using a tractor-mounted, compressed-CO_2 sprayer delivering 20 GPA at 30 psi. Application, environmental, crop, and weed information is shown in Table 1. Plot size was 10 × 35 feet and arranged in a randomized complete block with four replicates. Soil was a Beeler silt loam with pH 7.6 and 2.4% organic matter. Weed control was visually determined on June 16 and August 17, 2017, which was 11 and 73 days after the early postemergence treatments (DAPT), respectively. Corn yields were

determined by mechanical harvest of the two center rows of each plot on October 19, 2017, and adjusting grain weights to 15.5% moisture.

Results and Discussion

Palmer amaranth, kochia, quinoa, common sunflower, and green foxtail control was 97% or more regardless of herbicide or evaluation date, and did not differ between any treatments (data not shown). Crabgrass was controlled 94% or more by all treatments except Realm Q + atrazine, dicamba, and glyphosate at 11 and 73 DAPT; and Corvus + atrazine, dicamba and glyphosate at 73 DAPT (Table 2). The exceptional weed control with these herbicides resulted in grain yields that were 108 to 125 bu/a greater than in the untreated plots. However, no differences occurred among herbicide treatments for corn yield.

Table 1. Application information

Application timing	Preemergence	Early postemergence
Application date	May 16, 2017	June 5, 2017
Air temperature (°F)	93	91
Relative humidity (%)	22	26
Soil temperature (°F)	73	83
Wind speed (mph)	4	5
Wind direction	South	East
Soil moisture	Good	Good
Corn		
Height (inch)	---	4 to 6
Leaves (number)	0	1 to 2
Common sunflower		
Height (inch)	---	1 to 2
Density (plants/10 ft^2)	0	1
Palmer amaranth		
Height (inch)	---	0.5 to 2
Density (plants/10 ft^2)	0	10
Green foxtail		
Height (inch)	---	0.25 to 1
Density (plants/10 ft^2)	0	2
Kochia		
Height (inch)	---	1 to 2
Density (plants/10 ft^2)	0	2
Quinoa		
Height (inch)	---	0.5 to 2
Density (plants/10 ft^2)	0	1
Crabgrass		
Height (inch)	---	0.25 to 1
Density (plants/10 ft^2)	0	2

Table 2. Preemergence and early postemergence weed control in corn

Treatment	Rate/a	Timing[a]	Crabgrass		Corn yield
			11 DAPT[b]	73 DAPT	
			---------- % Visual ------		bu/a

Untreated	---		0	0	63.7
Instigate	6.0 oz	PRE	99	94	172.1
Cinch ATZ	2 qt	PRE			
Glyphosate	22 oz	PRE			
Nonionic surfactant	0.25%	PRE			
Ammonium sulfate	2%	PRE			
Realm Q	4.0 oz	EPOST	94	88	183.4
Atrazine	32 oz	EPOST			
Dicamba	4.0 oz	EPOST			
Glyphosate	22 oz	EPOST			
Crop oil concentrate	1%	EPOST			
Ammonium sulfate	2%	EPOST			
Corvus	5.6 oz	EPOST	98	91	188.7
Atrazine	32 oz	EPOST			
Dicamba	4.0 oz	EPOST			
Glyphosate	22 oz	EPOST			
Nonionic surfactant	0.25%	EPOST			
Ammonium sulfate	2%	EPOST			
Acuron	3.0 qt	EPOST	100	97	183.5
Glyphosate	22 oz	EPOST			
Nonionic surfactant	0.25%	EPOST			
Resicore	2.5 qt	EPOST	99	97	186.8
Atrazine	32 oz	EPOST			
Glyphosate	22 oz	EPOST			
Nonionic surfactant	0.5%	EPOST			
LSD (0.05)			3	6	29.2

[a] PRE = preemergence, EPOST = early postemergence when corn was in the two leaf stage.
[b] DAPT = days after early postemergence applications. Weed control ratings determined on June 16 and August 17, 2017. Corn grain yields determined on October 19, 2017.

Figure 1. Untreated control.

Figure 2. Instigate 6.0 oz/a + Cinch ATZ 2 qt/a + glyphosate 22 oz/a + nonionic surfactant 0.25% and ammonium sulfate 2% applied preemergence, 38 days after application.

Figure 3. Realm Q 4.0 oz/a + atrazine 32 oz/a + dicamba 4.0 oz/a + glyphosate 22 oz/a + crop oil concentrate 1% and ammonium sulfate 2% applied early postemergence, 18 days after application.

Figure 4. Corvus 5.6 oz/a + atrazine 32 oz/a + dicamba 4.0 oz/a + nonionic surfactant 0.25% and ammonium sulfate 2% applied early postemergence, 18 days after application.

Figure 5. Acuron 3.0 qt/a + glyphosate 22 oz/a and nonionic surfactant 0.25% applied early postemergence, 18 days after application.

Figure 6. Resicore 2.5 qt/a + atrazine 32 oz/a + glyphosate 22 oz/a and nonionic surfactant 0.5% applied early postemergence, 18 days after application.