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Efficacy of Impact Mixtures and Timings in Field Corn

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Summary

The objective of this research was to determine the utility of topramezone (Impact) herbicide for efficacy in corn. An experiment evaluated Impact with various tank mix and premix partners at several application timings for weed control in corn. Most herbicides provided excellent control of Palmer amaranth, common lambsquarters, and green foxtail. When Impact alone was applied late postemergence (LPOST) following Dual II Magnum (metolachlor) applied preemergence (PRE), kochia and Russian thistle control was less than 85%. Herbicides applied early postemergence (EPOST) or postemergence (POST) provided the best johnsongrass control early in the season, but no treatments controlled johnsongrass more than 90% late in the season.

Introduction

Early season weed control is an important component of preserving yield potential in corn. Typically, a broad-spectrum preemergence herbicide application followed by a postemergence herbicide treatment is recommended. This sequential program minimizes early competition and allows for controlling weed escapes while they are small. The objective of this study was to evaluate Impact in a single or sequential program for efficacy in corn.

Experimental Procedures

An experiment was conducted to evaluate Impact mixtures and application timings for efficacy in corn. All herbicides were applied using a tractor-mounted, compressed-CO_2 sprayer delivering 19.4 gpa at 30 psi and 4.1 mph. Application information and weed information are shown in Table 1. Plots were 10 by 35 feet and arranged in a randomized complete block with four replications. Soil was a Beeler silt loam with a pH of 7.9, 2.4% organic matter, and CEC of 17.8. Visual weed control ratings were taken on June 15 and July 20, 2022. These dates were 7 and 42 days after the late postemergence treatment (DA-D), respectively.

Results and Discussion

All herbicides controlled Palmer amaranth and common lambsquarters 95% or more throughout the season (data not shown). Similarly, green foxtail control was excellent with all herbicides except when Dual II Magnum PRE was followed by Impact alone LPOST at 7 DA-D. Kochia and Russian thistle were controlled 90% or more with most treatments throughout the season (Table 2). However, Dual II Magnum PRE followed by Impact LPOST controlled these weeds 70 to 84%. All EPOST and POST herbi-

cides controlled johnsongrass 89 to 98% early in the season. By 42 DA-D, johnsongrass control decreased to less than 91%.

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Table 1. Application, environmental, and weed data for the Impact study in corn[1]

Application timing	PRE	EPOST	POST	LPOST
Application date	April 25, 2022	May 22, 2022	June 2, 2022	June 8, 2022
Air temperature, °F	58	55	60	78
Relative humidity	30	44	58	44
Soil temperature, °F	53	55	57	74
Wind speed, mph	4 to 8	3 to 9	0 to 2	5 to 8
Wind direction	NNE	SSE	South	NNW
Soil moisture	Good	Good	Good	Good
Kochia				
Height, inches	---	1 to 3	2 to 5	6 to 10
Density, plants/ft^2	0	1.5	2.5	1.5
Russian thistle				
Height, inches	---	1 to 2	3 to 5	5 to 10
Density, plants/ft^2	0	0.3	0.5	0.1
Palmer amaranth				
Height, inches	---	1 to 2	---	---
Density, plants/ft^2	0	0.2	0	0
Common lambsquarters				
Height, inches	---	---	---	2 to 4
Density, plants/ft^2	0	0	0	0.2
Green foxtail				
Height, inches	---	1 to 2	2 to 3	3 to 5
Density, plants/ft^2	0	0.2	0.2	0.2
Johnsongrass				
Height, inches	---	---	1 to 3	2 to 6
Density, plants/ft^2	0	0	1.0	2.5

[1]PRE = preemergence. EPOST = early postemergence. POST = postemergence. LPOST = late postemergence.

Table 2. Weed control in the Impact mixtures study

			Kochia		Russian thistle		Johnsongrass	
Treatment[1]	Rate	Timing[2]	7 DA-D[3]	42 DA-D	7 DA-D	42 DA-D	7 DA-D	42 DA-D
	oz/a		% Visual					
Impact Core	30	EPOST	95	91	100	100	89	80
Atrazine	48	EPOST						
MSO	0.5%	EPOST						
AMS	1.5%	EPOST						
Impact Core	20	EPOST	98	93	100	98	94	85
Impact	0.5	EPOST						
Atrazine	48	EPOST						
MSO	1.0%	EPOST						
AMS	1.5%	EPOST						
Impact Core	20	EPOST	96	90	100	100	93	83
Atrazine	48	EPOST						
Glyphosate	28	EPOST						
MSO	0.5%	EPOST						
AMS	1.5%	EPOST						
Impact Core	30	EPOST	96	90	99	98	94	90
Hornet	3.0	EPOST						
Glyphosate	28	EPOST						
MSO	0.5%	EPOST						
AMS	1.5%	EPOST						
Sinate	28	EPOST	98	95	100	99	94	86
Atrazine	48	EPOST						
Dual II Magnum	21	EPOST						
MSO	1.0%	EPOST						
AMS	1.5%	EPOST						
Dual II Magnum	24	PRE	98	90	98	95	98	89
Impact Core	20	POST						
Atrazine	16	POST						
MSO	0.5%	POST						
AMS	1.5%	POST						
Dual II Magnum	24	PRE	99	94	100	100	91	85
Impact	1.0	POST						
Atrazine	16	POST						
MSO	1.0%	POST						
AMS	1.5%	POST						
Dual II Magnum	24	PRE	97	95	100	99	89	76
Sinate	24	POST						
Atrazine	16	POST						
MSO	1.0%	POST						
AMS	1.75%	POST						
Dual II Magnum	24	PRE	70	80	70	84	70	70
Impact	1.5	LPOST						
MSO	1.0%	LPOST						
AMS	1.75%	LPOST						
LSD (0.05)			7	7	2	6	6	12

[1] MSO = methylated seed oil. AMS = ammonium sulfate.
[2] EPOST = early postemergence. PRE = preemergence. POST = postemergence. LPOST = late postemergence.
[3] DA-D = days after the late postemergence applications.

Figure 1. Untreated control.

Figure 2. Impact Core 30 oz/a plus atrazine 48 oz applied early postemergence. Photo taken 59 days after the early postemergence application.

Figure 3. Impact Core 20 oz/a plus atrazine 48 oz/a plus glyphosate 28 oz/a applied early postemergence. Photo taken 59 days after the early postemergence application.

Figure 4. Dual II Magnum 24 oz/a applied preemergence followed by Impact Core 20 oz/a plus atrazine 16 oz applied postemergence. Photo taken 48 days after the postemergence application.

Figure 5. Dual II Magnum 24 oz/a applied preemergence followed by Impact 1.5 oz/a applied late postemergence. Photo taken 42 days after the late postemergence application.