

Efficacy of Preemergence and Sequential Applications with Corvus, Atrazine, Starane, Balance, Anthem, Capreno, Diflexx and Halex GT in Irrigated Corn

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Summary

Control of kochia and quinoa was 98 to 100% regardless of herbicide treatment at 48 days after post applications (DAPT), and 95% or more with all herbicides for Russian thistle. Palmer amaranth control was slightly less with preemergent (PRE) treatments alone compared to sequential treatments. Corvus (isoxaflutole + thiencazone) plus atrazine, Starane Ultra (fluroxypyr), and nonionic surfactant preemergence controlled crabgrass by 88%; whereas all other treatments provided 91% or more crabgrass control. Corn with the best herbicide treatments yielded 33 to 66 bu/a more than untreated corn.

Introduction

Several tank mixes containing isoxaflutole (Balance Flexx, Corvus) have often been shown to provide excellent foundation treatments to be followed by subsequent postemergence applications. Halex GT has often shown excellent control when applied early postemergence. It was the objective of this experiment to compare these treatments to various application timings of other herbicide tank mixes.

Procedures

An experiment conducted at the Kansas State University Southwest Research-Extension Center near Garden City, KS, evaluated the efficacy of preemergence and sequential herbicides in irrigated corn. Herbicides were applied preemergence alone (PRE), preemergence followed by early postemergence (EPOST), or postemergence (POST) (Table 1). Herbicides were applied using a tractor-mounted, compressed CO₂ plot sprayer delivering 20 gpa at 3 mph and 30 psi. Soil was a Ulysses silt loam with 1.4% organic matter, pH of 8.0, and cation exchange capacity of 18.4. Plots were 10 by 35 feet and arranged in a completely randomized block with four replications. Visual weed control was determined July 31, 2015, which was 48 days after POST applications (DAPT). Corn yields were determined October 8, 2015, by mechanically harvesting the center two rows of each plot and adjusting the weights to 15.5% moisture.

Results

The preemergence treatment of Starane Ultra plus nonionic surfactant alone provided no residual control of any weed species at 48 DAPT. Control of kochia and quinoa was 98 to 100% regardless of herbicide treatment at 48 DAPT, and 95% or more with all herbicides for Russian thistle (Table 2). Palmer amaranth control was slightly less (94%) with preemergence treatments alone compared to sequential treatments (98 to 100%). Corvus plus atrazine, Starane Ultra, and nonionic surfactant PRE controlled crabgrass 88%, whereas all other treatments provided 91% or better crabgrass control. Corn, receiving the most herbicide treatments, yielded 33 to 66 bu/a more than untreated corn; corn treated with Starane Ultra plus nonionic surfactant PRE did not.

Table 1. Application information.

Application timing	Preemergence	Early postemergence	Postemergence
Application date	May 18, 2015	June 8, 2015	June 15, 2015
Air temperature (°F)	63	87	77
Relative humidity (%)	43	26	68
Soil temperature (°F)	58	76	70
Wind speed (mph)	8 to 10	4 to 6	4 to 6
Wind direction	North-northeast	North	Northwest
Soil moisture	Good	Good	Fair

Table 2. Efficacy of preemergence and sequential herbicides in irrigated corn.

Treatment ^a	Rate	Timing	48 days after POST application					Yield bu/a
			SASKR ^b	AMAPA ^c	KCHSC ^d	CHEQU ^e	DIGSS ^f	
			----- % control -----					
Corvus	5.6 oz	PRE	100	94	100	100	88	201.9
Atrazine	32 oz	PRE						
Starane Ultra	18.3 oz	PRE						
NIS	0.25 %	PRE						
Balance Flexx	4.0 oz	PRE	98	94	100	100	91	211.7
Harness Xtra 6.0	77 oz	PRE						
Starane Ultra	18.3 oz	PRE						
NIS	0.25 %	PRE						
Balance Flexx	4.0 oz	PRE	95	94	98	100	91	179.3
Anthem ATZ	32 oz	PRE						
Starane Ultra	18.3 oz	PRE						
NIS	0.25 %	PRE						
Starane Ultra	18.3 oz	PRE	100	100	100	100	94	210.1
NIS	0.25 %	PRE						
Roundup PowerMax	32 oz	EPOST						
Capreno	3.0 oz	EPOST						
Atrazine	32 oz	EPOST						
Diflexx	8 oz	EPOST						
Superb HC	1.0 %	EPOST						
AMS	1.5 lb	EPOST						
Starane Ultra	18.3 oz	PRE	100	98	99	100	96	210.2
NIS	0.25 %	PRE						
Halex GT	58 oz	EPOST						
Diflexx	8 oz	EPOST						
NIS	0.25 %	EPOST						
AMS	1.5 lb	EPOST						
Corvus	3.3 oz	PRE	100	100	99	100	95	194.6
Atrazine	32 oz	PRE						
Starane Ultra	18.3 oz	PRE						
NIS	0.25%	PRE						
Roundup PowerMax	32 oz	POST						
Capreno	3.0 oz	POST						
Atrazine	16 oz	POST						
Diflexx	8 oz	POST						
Superb HC	1.0 %	POST						
AMS	1.5 lb	POST						
Corvus	3.3 oz	PRE	100	98	100	100	91	205.1
Atrazine	32 oz	PRE						
Starane Ultra	18.3 oz	PRE						
NIS	0.25%	PRE						
Roundup PowerMax	32 oz	POST						
Laudis Flexx	32 oz	POST						
Atrazine	16 oz	POST						
Destiny HC	1 %	POST						
AMS	1.5 lb	POST						

continued

Table 2. Efficacy of preemergence and sequential herbicides in irrigated corn.

Treatment ^a	Rate	Timing	48 days after POST application					Yield bu/a
			SASKR ^b	AMAPA ^c	KCHSC ^d	CHEQU ^e	DIGSS ^f	
			----- % control -----					
Corvus	3.3 oz	PRE	100	100	100	100	95	204.1
Atrazine	32 oz	PRE						
Starane Ultra	18.3 oz	PRE						
NIS	0.25%	PRE						
Roundup PowerMax	32 oz	POST						
Diflexx	10 oz	POST						
Atrazine	16 oz	POST						
Destiny HC	1 %	POST						
AMS	1.5 lb	POST						
Starane Ultra	18.3 oz	PRE	0	0	0	0	0	154.2
NIS	0.25 %	PRE						
Untreated	---	---	0	0	0	0	0	145.7
LSD (0.05)			4.9	5.6	2.9	NS	5.8	23.7

^aNIS is nonionic surfactant, AMS is ammonium sulfate.

^bSASKR is Russian thistle.

^cAMAPA is Palmer amaranth.

^dKCHSC is kochia.

^eCHEQU is quinoa.

^fDIGSS is crabgrass.



Figure 1. Untreated control.



Figure 2. Starane Ultra 18.3 oz + NIS 0.25% preemergence followed by Roundup Power-Max 32 oz + Capreno 3 oz + atrazine 32 oz + Superb HC 1% + AMS 1.5 lb early postemergence, 58 days after early postemergence treatment.



Figure 3. Starane Ultra 18.3 oz + NIS 0.25% preemergence followed by Halex GT 58 oz + Diflexx 8 oz + NIS 0.25% + AMS 1.5 lb early postemergence, 58 days after early postemergence treatment.



Figure 4. Corvus 3.3 oz + atrazine 32 oz + Starane Ultra 18.3 oz + NIS 0.25% preemergence followed by Roundup PowerMax 32 oz + Capreno 3 oz + atrazine 16 oz + Diflexx 8 oz + Superb HC 1% + AMS 1.5 lb postemergence, 51 days after postemergence treatment.



Figure 5. Corvus 3.3 oz + atrazine 32 oz + Starane Ultra 18.3 oz + NIS 0.25% preemergence followed by Roundup PowerMax 32 oz + Diflexx 10 oz + atrazine 16 oz + Destiny HC 1% + AMS 1.5 lb postemergence, 51 days after postemergence treatment.