

Weed Control with Accent, Callisto, Isoxadifen, Impact Cinch, Dicamba, and Atrazine in Irrigated Corn

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Summary

Some timings and combinations of the herbicides tested in this study controlled Palmer amaranth, kochia, quinoa, Russian thistle, and green foxtail from 95 to 100% 51 days after postemergence application (DA-B). Accent (nicosulfuron) plus Callisto (mesotrione) and isoxadifen alone postemergence provided 88% Palmer amaranth control at 51 DA-B. Kochia control was 92 and 90% when Accent plus Callisto and isoxadifen alone or with atrazine and Dicamba XP (dicamba) was applied postemergence following Cinch (*S*-metolachlor) preemergence application. Crabgrass control with preemergence followed by postemergence treatments exceeded 89%. Crabgrass control was 83 and 88% when no preemergence herbicide was applied prior to postemergence herbicides. No herbicide treatment increased corn yield relative to the untreated controls.

Introduction

Accent has been used for weed control in corn for more than 25 years. It provides excellent control of sorghum and some very small grass spp. Also, it can sometimes improve broadleaf weed control of other herbicides if the weed in question is not resistant to herbicides from the ALS family. It is not, however, a stand-alone treatment for weed control in corn if weeds other than Sorghum spp. are present. Therefore, the objective of this study was to explore tank mix partners that add value to Accent.

Procedures

An experiment conducted at the Kansas State University Southwest Research-Extension Center near Garden City, KS investigated the efficacy of Accent, Callisto, and isoxadifen along with several tank mix partners postemergence in corn. The experimental area was seeded with a mixture of kochia, green foxtail, crabgrass, and quinoa seed prior to corn planting. Quinoa seed was used as a surrogate for lambsquarters. All other weed populations were naturally occurring. Preemergence herbicides were applied May 18, 2015, and postemergence applications occurred on June 16, 2015. Corn was 6 to 9 inches tall at the time of postemergence treatment, and weeds were 1 to 5 inches tall. All herbicides were applied with a tractor-mounted, compressed-CO₂ sprayer delivering 20 gpa at 30 psi and 3 mph. 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 randomized complete block with four replications. Weed control was visually rated on August 6, 2015, 51 days after postemergence application (DA-B). Corn yields were

determined October 10, 2015, by harvesting the center two rows of each plot with a plot combine and adjusting the weights to 15.5% moisture.

Results and Discussion

All herbicides controlled quinoa 100%, Russian thistle 95 to 100%, and green foxtail 96% or more at 51 DA-B. Palmer amaranth control was 95% or more when Accent plus Callisto and isoxadifen were applied postemergence with atrazine or when these herbicides were applied following a preemergence herbicide treatment. Accent plus Callisto and isoxadifen alone postemergence provided 88% Palmer amaranth control at 51 DA-B. Similarly, Accent plus Callisto and isoxadifen alone postemergence controlled kochia 95% at 51 DA-B. Kochia control was 92 and 90% when Accent plus Callisto and isoxadifen alone or with atrazine and Dicamba XP (dicamba) were applied postemergence following Cinch preemergence. Crabgrass control with preemergence followed by postemergence treatments exceeded 90% except when Cinch preemergence was followed by Accent plus Callisto, isoxadifen, atrazine, and Dicamba XP (89%). Crabgrass control was 83 and 88% when no preemergence herbicide was applied prior to postemergence herbicides. No herbicide treatment increased corn yield relative to the untreated controls.

Table 1. Application information.

Application timing	Preemergence	Postemergence
Application date	May 18, 2015	June 16, 2015
Air temperature (°F)	72	78
Relative humidity (%)	32	51
Soil temperature (°F)	66	71
Wind speed (mph)	8 to 10	2 to 4
Wind direction	North-Northeast	South
Soil moisture	Good	Fair

Table 2. Weed control with nicosulfuron, mesotrione, isoxadifen and atrazine in irrigated corn.

Treatment ^a	Rate	Timing	51 days after POST application						Yield
			Palmer amaranth	Kochia	Russian thistle	Quinoa	Crabgrass	Green foxtail	
	oz/a		----- % visual -----						bu/a
Cinch	16 oz	PRE	95	92	95	100	93	100	197.7
Accent	0.65 oz	POST							
Callisto	2.5 oz	POST							
Isoxadifen	0.25 oz	POST							
COC	1%	POST							
AMS	2.0 lb	POST							
Cinch	16 oz	PRE	100	97	99	100	98	100	183.8
Accent	0.65 oz	POST							
Callisto	2.5 oz	POST							
Isoxadifen	0.25 oz	POST							
Atrazine	16 oz	POST							
COC	1%	POST							
AMS	2.0 lb	POST							
Cinch	16 oz	PRE	95	90	96	100	89	97	166.8
Accent	0.65 oz	POST							
Callisto	2.5 oz	POST							
Isoxadifen	0.25 oz	POST							
Atrazine	16 oz	POST							
Dicamba XP	4.0 oz	POST							
COC	1%	POST							
AMS	2.0 lb	POST							
Cinch	16 oz	PRE	98	98	100	100	98	100	185.1
Accent	0.65 oz	POST							
Callisto	2.5 oz	POST							
Isoxadifen	0.25 oz	POST							
Atrazine	16 oz	POST							
Impact	0.75 oz	POST							
COC	1%	POST							
AMS	2.0 lb	POST							
Cinch ATZ	2.0 qt	PRE	100	100	99	100	96	100	185.3
Accent	0.65	POST							
Callisto	2.5 oz	POST							
Isoxadifen	0.25 oz	POST							
COC	1%	POST							
AMS	2.0 lb	POST							
Cinch ATZ	1.5 qt	PRE	99	100	100	100	99	100	190.2
Accent	0.65 oz	POST							
Callisto	2.5 oz	POST							
Isoxadifen	0.25 oz	POST							
Cinch ATZ	1.0 qt	POST							
COC	1%	POST							
AMS	2.0 lb	POST							

continued

Table 2. Weed control with nicosulfuron, mesotrione, isoxadifen and atrazine in irrigated corn.

Treatment ^a	Rate	Timing	51 days after POST application						Yield
			Palmer amaranth	Kochia	Russian thistle	Quinoa	Crabgrass	Green foxtail	
			----- % visual -----						
Cinch ATZ	2.0 qt	PRE	99	100	100	100	97	99	191.9
Impact	3.0 oz	POST							
MSO	1%	POST							
AMS	2.0 lb	POST							
Accent	0.65 oz	POST	88	95	99	100	83	96	178.6
Callisto	2.5 oz	POST							
Isoxadifen	0.25 oz	POST							
COC	1%	POST							
AMS	2.0 lb	POST							
Accent	0.65 oz	POST	96	100	100	100	88	96	185.0
Callisto	2.5 oz	POST							
Isoxadifen	0.25 oz	POST							
Atrazine	16 oz	POST							
COC	1%	POST							
AMS	2.0 lb	POST							
Untreated	---	---	0	0	0	0	0	0	185.4
LSD (0.05)			4.5	3.6	3.9	NS	6.0	4.0	NS

^a All plots received Starane Ultra (fluroxypyr) at 18.3 oz/a plus nonionic surfactant at 0.25% v/v preemergence. COC is crop oil concentrate, AMS is ammonium sulfate, and MSO is methylated seed oil.



Figure 1. Untreated control.



Figure 2. Cinch ATZ 1.5 qt preemergence followed by Accent 0.65 oz + Callisto 2.5 oz + Isoxadifen 0.25 oz + Cinch ATZ 1.0 qt + COC 1% + AMS 2.0 lb postemergence 59 days after postemergence treatment.



Figure 3. Cinch ATZ 2.0 qt preemergence followed by Laudis 3 oz + COC 1% + AMS 2 lb postemergence 59 days after postemergence treatment.



Figure 4. Accent 0.65 oz + Callisto 2.5 oz + Isoxadifen 0.25 oz + COC 1% + AMS 2 lb postemergence 59 days after postemergence treatment.