K-STATE Research and Extension

2016 SWREC Agricultural Research

Efficacy of Anthem Maxx, Solstice, Cadet, Roundup PowerMax, and Competitive Standards in Irrigated Corn

R. Currie and P. Geier

Summary

Control of Palmer amaranth and green foxtail was generally best when herbicides were applied as sequential treatments of preemergence (PRE) followed by late postemergence (LPOST) or as postemergence (POST) alone. Velvetleaf and puncturevine control was 95 and 93% or more, respectively, regardless of herbicide or application timing. Corn receiving herbicide treatments yielded 42 to 72 bu/a more grain than non-treated corn.

Introduction

Anthem Maxx (pyroxasulfone + fluthiacet), Acuron (*S*-metolachlor + atrazine + mesotrione + bicyclopyrone), Corvus (isoxaflutole + thiencarbazone) and Surestart (acetochlor + flumetsulam + clopyralid) all provide excellent preemergence control but sometimes benefit by a cleanup application of glyphosate applied at some point after emergence. A total postemergence application is seldom superior to a PRE followed by POST application; if it is, the timing of that POST application is very important. Therefore, very strong PRE programs followed by a clean-up application of glyphosate were compared to EPOST and POST applications of various products.

Procedures

An experiment conducted at the Kansas State University Southwest Research-Extension Center near Garden City, KS, evaluated the effects of Anthem Maxx (pyroxasulfone + fluthiacet), Solstice (fluthiacet + mesotrione), and Cadet (fluthiacet) application timings compared to standard treatments for efficacy in irrigated corn. Herbicides were applied as sequential treatments of preemergence (PRE) followed by late postemergence (LPOST) or as single applications of early postemergence (EPOST) or postemergence (POST) (Table 1). All herbicides were applied using a tractor-mounted, CO_2-compressed sprayer delivering 20 gpa at 3.0 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 randomized complete block with 4 replications.

Results and Discussion

Control of Palmer amaranth was 90% or more when any herbicides were applied PRE followed by LPOST or as POST treatments alone at 29 days after POST applications (Table 2). When most herbicides were applied EPOST alone, Palmer amaranth control

was 83 to 88%. The exception was Status plus Roundup PowerMax EPOST (90%). Corvus applied PRE followed by Roundup PowerMax LPOST completely controlled puncturevine, and control was similar to most other herbicides. The exceptions were Cadet (fluthiacet) plus Diflexx (dicamba) and Roundup PowerMax or Halex GT (*S*-metolachlor + glyphosate + mesotrione) plus nonionic surfactant, each applied alone EPOST. Velvetleaf control was 95% or more regardless of herbicide treatment. The best green foxtail control was obtained when herbicides were applied PRE followed by LPOST or by POST alone. However, Status plus Roundup PowerMax EPOST and Halex GT and nonionic surfactant EPOST also provided good green foxtail control. Corn receiving herbicide treatments yielded 111.6 to 141.2 bu/a, and all out-yielded the untreated check (69.2 bu/a). No yield differences occurred between herbicide treatments.

Table 1. Application information.

Application timing	Preemergence	Early postemergence	Postemergence	Late postemergence
Application date	June 2, 2015	June 11, 2015	June 23, 2015	June 29, 2015
Air temperature (F)	75	75	72	77
Relative humidity (%)	62	64	64	37
Soil temperature (F)	67	74	77	77
Wind speed (mph)	6 to 9	6 to 8	4 to 6	8 to 10
Wind direction	South	North-northwest	East-northeast	East-southeast
Soil moisture	Good	Fair	Fair	Fair

Table 2. Efficacy of Anthem Maxx, Solstice, Cadet, Roundup PowerMax and competitive standard timings in irrigated corn.

			29 days after postemergence application				
Treatment[a]	Rate	Timing[b]	Palmer amaranth	Puncturevine	Velvetleaf	Green foxtail	Yield
			% control				bu/a
Anthem Maxx	4.0 oz	PRE	93	98	100	98	113.0
Roundup PowerMax	32 oz	LPOST					
AMS	1.0%	LPOST					
Anthem Maxx	4.0 oz	PRE	98	93	100	98	119.6
Atrazine	32 oz	PRE					
Roundup PowerMax	32 oz	LPOST					
AMS	1.0%	LPOST					
Anthem Maxx	4.0 oz	PRE	90	96	100	97	121.8
Atrazine	32 oz	PRE					
Balance Flexx	2 oz	PRE					
Roundup PowerMax	32 oz	LPOST					
AMS	1.0%	LPOST					
Anthem Maxx	4.0 oz	PRE	91	98	100	93	130.6
Atrazine	32 oz	PRE					
Solstice	3.0 oz	LPOST					
Roundup PowerMax	32 oz	LPOST					
AMS	1.0%	LPOST					
Anthem Maxx	4.0 oz	PRE	90	93	100	93	142.2
Solstice	2.5 oz	LPOST					
Atrazine	16 oz	LPOST					
Roundup PowerMax	32 oz	LPOST					
AMS	1.0%	LPOST					
Dual II Magnum	1.3 pt	PRE	94	95	98	96	119.8
Roundup PowerMax	32 oz	LPOST					
AMS	1.0%	LPOST					
SureStart	32 oz	PRE	94	99	100	95	123.2
Roundup PowerMax	32 oz	LPOST					
AMS	1%	LPOST					
Acuron	2.5 qt	PRE	97	97	100	97	119.0
Glyphosate	32 oz	LPOST					
AMS	1.0%	LPOST					
Corvus	4.0 oz	PRE	93	100	100	99	133.0
Glyphosate	32 oz	LPOST					
AMS	1.0%	LPOST					
Solstice	2.5 oz	EPOST	84	94	100	86	134.0
Atrazine	16 oz	EPOST					
Roundup PowerMax	32 oz	EPOST					
AMS	1.0%	EPOST					
Solstice	2.5 oz	EPOST	83	94	95	84	111.5
Anthem Maxx	2.0 oz	EPOST					
Roundup PowerMax	32 oz	EPOST					
AMS	1.0%	EPOST					

continued

Table 2. Efficacy of Anthem Maxx, Solstice, Cadet, Roundup PowerMax and competitive standard timings in irrigated corn.

			29 days after postemergence application				
Treatment[a]	Rate	Timing[b]	Palmer amaranth	Puncturevine	Velvetleaf	Green foxtail	Yield
			% control				bu/a
Solstice	2.5 oz	EPOST	86	95	100	89	130.1
Anthem Maxx	2.0 oz	EPOST					
Atrazine	16 oz	EPOST					
Roundup PowerMax	32 oz	EPOST					
AMS	1.0%	EPOST					
Cadet	0.7 oz	EPOST	83	90	100	81	125.4
Diflexx	12 oz	EPOST					
Roundup PowerMax	32 oz	EPOST					
AMS	1.0%	EPOST					
Status	3.0 oz	EPOST	90	95	100	93	138.7
Roundup PowerMax	32 oz	EPOST					
AMS	1.0%	EPOST					
Halex GT	3.6 pt	EPOST	88	91	100	93	129.0
NIS	0.25%	EPOST					
AMS	1.0%	EPOST					
Anthem Maxx	4.0 oz	POST	95	100	100	98	133.5
Atrazine	32 oz	POST					
Glyphosate	32 oz	POST					
AMS	1.0 %	POST					
Anthem Maxx	4.0 oz	POST	98	100	100	100	128.2
Roundup PowerMax	32 oz	POST					
AMS	1.0%	POST					
Anthem Maxx	4.0 oz	POST	98	99	100	100	141.6
Diflexx	12 oz	POST					
Roundup PowerMax	32 oz	POST					
AMS	1.0%	POST					
Untreated	---	---	0	0	0	0	69.2
LSD (0.05)			7.3	7.0	2.9	7.4	33.0

[a] AMS is ammonium sulfate, NIS is nonionic surfactant.

[b] PRE is preemergence, EPOST is early postemergence, POST is postemergence, and LPOST is late postemergence.

Figure 1. Untreated control.

Figure 2. Anthem Maxx 4 oz preemergence followed by Roundup PowerMax 32 oz + AMS 1% late postemergence, 37 days after late postemergence treatment.

Figure 3. Anthem Maxx 4 oz + Roundup PowerMax 32 oz + AMS 1% postemergence, 43 days after postemergence treatment.

Figure 4. Solstice 2.5 oz + Anthem Maxx 2 oz + Roundup PowerMax 32 + AMS early postemergence, 55 days after early postemergence treatment.