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2018 SWREC Agricultural Research

Dicamba-Tolerant Volunteer Soybean, Palmer Amaranth, and Green Foxtail Control in Irrigated Field Corn

R.S. Currie and P.W. Geier

Summary

Dicamba-tolerant soybean control was best when Armezon (topramezone) or Armezon Pro (topramezone + dimethenamid) was applied POST with atrazine and glyphosate, and when Status (dicamba + diflufenzopyr), atrazine, and glyphosate were applied POST. These treatments, along with PRE treatments of Armezon Pro and atrazine, completely controlled soybean. Similarly, control of Palmer amaranth and green foxtail was generally best with Armezon Pro and atrazine applied PRE or any herbicide combination applied POST. Corn receiving PRE treatments yielded 41 to 120 bu/a more grain than the weedy checks, whereas corn treated POST yielded 117 to 145 bu/a more grain than the untreated corn.

Introduction

With the advent of dicamba-tolerant soybean it has been postulated that they will be weeds in the subsequent corn crop. Dicamba has long been used as a foundation for postemergence broadleaf weed control in corn. If dicamba is not effective on dicamba-tolerant volunteer soybean, new tank mixes will be needed. Therefore, it was the objective of this study to test various other compounds to control dicamba-tolerant soybean and broadleaf weeds in corn.

Experimental Procedures

An experiment at the Kansas State University Southwest Research-Extension Center near Garden City, KS, evaluated preemergence (PRE) Armezon, Armezon Pro, and atrazine or these compounds applied postemergence (POST) with glyphosate for control of dicamba-tolerant soybean in field corn. Application, environmental, and weed information is given in Table 1. The experimental area was overseeded with dicamba-tolerant soybean seed prior to planting corn, whereas the Palmer amaranth and green foxtail populations were naturally occurring. Herbicides were applied using a tractor-mounted, compressed-CO_2 sprayer delivering 20 GPA at 30 psi. Plot size was 10 × 35 feet arranged in a randomized complete block design with four replications. Soil for the experiment was a Beeler silt loam with 2.4% organic matter and pH 7.6. Visual weed control ratings were determined on June 20 and September 5, 2017, which was 5 and 82 days after the POST treatments (DAPT), respectively. Grain yields were determined by mechanically harvesting the center two rows of each plot on October 20, 2017, and adjusting weights to 15.5% moisture.

Results and Discussion

Dicamba-tolerant soybean control at 5 DAPT was best when Armezon or Armezon Pro was applied POST with atrazine and glyphosate, or when with Status, atrazine, and glyphosate were applied POST (Table 2). These treatments, along with PRE treatments of Armezon Pro and atrazine, completely controlled soybean at 82 DAPT. Similarly, control of Palmer amaranth and green foxtail was generally best with Armezon Pro and atrazine applied PRE or any herbicide combination applied POST regardless of evaluation date. Corn receiving PRE treatment of any herbicide yielded 41 to 120 bu/a more than the weedy checks; however, corn treated POST with any herbicide treatment yielded 117 to 145 bu/a more grain than the untreated controls.

Table 1. Application information

Application timing	Preemergence	Postemergence
Application date	May 16, 2017	June 15, 2017
Air temperature (°F)	93	77
Relative humidity (%)	22	58
Soil temperature (°F)	73	74
Wind speed (mph)	4	5
Wind direction	South	South-southeast
Soil moisture	Good	Good
Volunteer soybean		
Height (inch)	---	5
Density (plants/ft^2)	0	2.3
Palmer amaranth		
Height (inch)	---	5
Density (plants/ft^2)	0	2.3
Green foxtail		
Height (inch)	---	0.4
Density (plants/ft^2)	0	0.3

Table 2. Control of dicamba-tolerant soybean in corn

			Soybean		Palmer amaranth		Green foxtail		
Treatment[a]	Rate	Timing[b]	5 DAPT[c]	82 DAPT	5 DAPT	82 DAPT	5 DAPT	82 DAPT	Corn yield
	oz/a		% Visual						bu/a
Untreated	---		0	0	0	0	0	0	48.3
Armezon	0.5	PRE	74	70	67	52	77	57	89.0
Atrazine	16	PRE							
Armezon	0.75	PRE	80	81	78	63	84	73	118.8
Atrazine	16	PRE							
Armezon Pro	16	PRE	70	100	93	85	100	98	168.5
Atrazine	16	PRE							
Armezon Pro	20	PRE	83	100	90	85	98	100	156.2
Atrazine	16	PRE							
Armezon	0.5	POST	95	100	91	88	95	98	187.1
Atrazine	16	POST							
Glyphosate	32	POST							
MSO	1%	POST							
AMS	2%	POST							
Armezon	0.75	POST	95	100	93	87	98	100	191.3
Atrazine	16	POST							
Glyphosate	32	POST							
MSO	1%	POST							
AMS	2%	POST							
Armezon Pro	16	POST	95	100	94	87	100	100	174.5
Atrazine	16	POST							
Glyphosate	32	POST							
Superb HC	0.5%	POST							
AMS	2%	POST							
Armezon Pro	20	POST	95	100	94	78	100	100	165.5
Atrazine	16	POST							
Glyphosate	32	POST							
Superb HC	0.5%	POST							
AMS	2%	POST							
Status	5	POST	95	100	93	89	100	100	192.9
Atrazine	16	POST							
Glyphosate	32	POST							
MSO	1%	POST							
AMS	2%	POST							
LSD (0.05)			7	6	9	11	5	5	25.0

[a]AMS = ammonium sulfate. MSO = methylated seed oil.

[b]PRE = preemergence. POST = postemergence.

[c]DAPT = days after postemergence application. Weed control was determined on June 20 and September 5, 2017, whereas yields were determined on October 20, 2017.

Figure 1. Untreated control.

Figure 2. Armezon 0.75 oz/a + atrazine 16 oz/a applied preemergence, 41 days after pre-emergence application.

Figure 3. Armezon Pro 20 oz/a + atrazine 16 oz/a applied preemergence, 41 days after preemergence application.

Figure 4. Armezon 0.75 oz/a + atrazine 16 oz/a + glyphosate 32 oz/a + methylated seed oil 1% + ammonium sulfate 2% applied postemergence, 11 days after postemergence application.

Figure 5. Armezon Pro 20 oz/a + atrazine 16 oz/a + glyphosate 32 oz/a + Superb HC 0.5% + ammonium sulfate 2% applied postemergence, 11 days after postemergence application.