Corn Herbicide Trials; BASF Collaboration

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Two corn trials were conducted in 2013 to evaluate the effectiveness of pre-emergent (PRE) and residual herbicides on grass and broadleaf weeds. One of the primary targets for these herbicide programs in a commercial setting is kochia, however, poor kochia emergence this year led to the absence of any evaluation. Each of the two trials contained 13 treatments. Trial 1 was focused on applying a pre-emergent residual, followed by a post-emergent residual (plus glyphosate), potentially providing a clean field all season. The highlighted treatments were applied only at the V2 corn growth stage to provide a comparison between one and two applications; glyphosate was not applied to these treatments later in the season. In Trial 2, residual products were only applied PRE with glyphosate alone applied as a post-emergent measure. Roundup Powermax was the glyphosate formulation used, applied at 22 oz/ac with 0.25% NIS and AMS at 8 lb/100 gal. Each study contained four replicates, each 30' long for weed evaluation and harvest.

Unfortunately, the PRE application timing did not receive adequate rain activation for control. The predicted rain at the time of application did not occur, with the next rainfall event occurring three days after application and only 0.5". Zidua, in particular, needs at least 1" of rain for adequate activation. Consequently, the actual weed control from these products was variable and lower than what would be expected under better conditions. Still, the resulting weed control data is useful. The other issue with the trial was the abundance of Canada thistle in a number of the plots. Of the products used, only Status and Surestart have meaningful activity on Canada thistle. While this did not influence weed control measurement much, it certainly could skew the yield data and did contribute to variability.

In both experiments there was no phytotoxicity to the corn as a result of herbicide treatments. As far as treatment effectiveness on weed species, Zidua alone was fairly poor on grass control across both studies. Capreno and Balance Flexx were similarly poor. Even with the poor activation, all herbicides except Dual II Magnum (at all rating periods) and Capreno (only at the earliest rating period) provided acceptable pigweed control throughout the season. In Trial 2, control was improved 8 WAT by the application of the mid-season glyphosate a week prior to evaluation.

For controlling glyphosate resistant kochia, Zidua (pyroxasulfone), applied in combination with another product such as Verdict, Sharpen, AAtrex, or others, should be an effective option. Fierce and Anthem also contain pyroxasulfone along with either Valor or Cadet respectively, making them a good option as standalone products for kochia control. In summary, pyroxasulfone will be an important product in managing glyphosate-resistant kochia in the future as it is a new class of herbicide, but will need the help of other products for high levels of control.

Table 1. Weed control with Verdict and Zidua in corn.

----------PP----------		----------POST----------		----------Control----------				----------Harvest----------		
Product	Rate	Product	Rate	3 weeks after PRE		3 weeks after POST		Moisture	Test Weight	Yield
	oz/a		oz/a	Foxtail*	RRPGWD**	Foxtail	RRPGWD	%	lb/bu	bu/a
				%	%	%	%			
Trial 1. PP and POST residual treatments										
non treated	-			0	0	0	0	.	52.15	15.0
Zidua	2.5	Status	5	60	76	63	95	21.2	52.55	91.3
Zidua	2.5	Armezon + AAtrex	0.5 + 1 pt/a	40	73	65	95	20.6	52.14	87.5
Zidua + AAtrex	2.5 + 0.5 qt			53	81	85	90	19.4	52.39	96.3
+Armezon	0.5									
Verdict	13	Status	5	58	88	78	95	21.1	52.01	102.5
Verdict	13	Armezon + AAtrex	0.5 + 1 pt/a	77	91	55	93	21.2	52.25	106.3
Verdict + Zidua	10 + 2.5	Status	5	74	95	79	95	20.1	52.54	110.0
Halex GT + AAtrex	4 pt/a + 1 qt/a			68	93	90	95	19.8	53.00	107.5
Capreno + AAtrex	3 + 1 pt/a			50	94	86	95	19.5	52.75	108.8
Anthem ATZ	2.25 pt/a			61	76	86	94	21.2	52.69	91.3
Surestart	2.5 pt/a			74	91	78	94	19.2	53.17	106.3
Dual II Magnum	1.5 pt/a	Callisto Extra	1.5 pt/a	66	64	76	89	18.9	53.57	78.8
Lumax	4 pt/a			66	76	83	94	18.3	53.93	91.3
LSD (0.05)				15	18	12	5	2.3	1.14	18.8

planted 5/17; harvested 10/21

			2 WAT***	------4 WAT--------		---------8 WAT---------		----------Harvest----------		
Trial 2. PP followed by glyphosate			Foxtail	RRPGWD	Foxtail	RRPGWD	Foxtail	Moisture	Test Weight	Yield
non treated	-		0	0	0	0	0	.	53.08	28.1
Zidua	2.5		46	78	53	99	95	21.4	52.50	88.9
Zidua + Sharpen	2.5 + 2.5		54	85	56	99	98	19.9	52.73	99.5
Zidua + Verict	2.5 + 10		65	92	60	99	91	21.1	52.33	108.0
Zidua + Verict	2.5 + 10		66	95	73	99	99	20.8	52.38	119.2
+AAtrex	1 pt/a									
Zidua + Sharpen	2.5 + 2.5		60	96	60	99	99	20.6	52.20	95.2
+AAtrex	1 pt/a									
Verdict	13		59	91	53	99	99	20.8	51.93	103.7
Anthem ATZ	2.25 pt/a		70	96	79	99	99	20.8	51.98	106.0
Lumax	2.5 qt/a		66	89	74	99	99	20.3	52.18	107.4
Surestart	2.5 pt/a		68	95	66	99	97	20.8	51.75	103.1
Corvus + Aatrex	5.6 + 1 pt/a		68	94	58	99	97	19.9	53.25	101.8
Balance Flexx	5		48	93	54	99	99	21.1	52.13	100.0
+AAtrex	1 pt/a									
Capreno	3		43	68	39	99	99	21.0	52.18	93.3
LSD (0.05)			12.8	12.6	11.1	0	4	2.2	0.98	10.1

*green and yellow foxtail **redroot pigweed *** Weeks after Treatment planted 5/17; harvested 11/4