Residual Activity of Postemergence HPPD-inhibitor Herbicides (S0914)

A field study was initiated near Clay Center, Nebraska to evaluate weed control and residual activity of three HHPD-inhibitor herbicides with and without atrazine. The three herbicides evaluated were tembotrione (Laudis), topramezone (Impact), and mesotrione (Callisto). The experimental design was a randomized complete block with four replications. Plots were 10 feet wide and 30 feet long and were located on a silt loam soil with an organic matter content of 2.5% and ph of 6.5. Corn, 'DKC61-69' RR2, was planted at 29,600 seeds per acre on April 27 and emerged on May 10. Herbicides were applied EPOST on May 19, 2009. Herbicides were applied with a tractor-mounted sprayer calibrated to deliver 15 gallons of water per acre at 30 PSI using AIXR 110015 flat spray nozzles. The environmental conditions at the time of herbicide application are given in Table 1. Rainfall in the amount of 0.62 inch was received thirteen days after EPOST application. . Rainfall received 10 days before and 10 days after herbicide applications is listed in Table 2. Plots received 13.97 inches of rain and 8.25 inches of irrigation water applied by lateral-move overhead sprinklers during growing season.

Primary weeds present in plots at time of herbicide application consisted of sorghum (SORSS), velvetleaf (ABUTH), common waterhemp (AMATA), and common lambsquarters (CHEAL) at average densities of 8, 13, 23, and 3 plants per square foot. Counts were taken weekly in 6 quandrants of one square foot in each plot.

Velvetleaf and common waterhemp begin appearing in plots at 13 DAT. Foxtail species begin appearing in all treatments at 20 DAT. Treatments of glyposate alone and glyposate + Status had the highest numbers of common waterhemp at 34 DAT. Treatments of glyphosate + Callisto, glyphosate + Callisto + atrazine, and glyphosate + Laudis + atrazine had the lowest counts of waterhemp at 34 DAT.

Overall average corn yield across treatments was 243.1 bu/A. Corn yield in the untreated plots averaged 68.3 bu/A. There was no significant difference in yields between herbicide treatments.

Table 1. Environmental conditions at the time of herbicide application.

Appl. Date	Air Temperature (F)	Humidity (%)	Wind Speed & direction (mph)	Time of day	Corn growth stage	Weed and Corn heights (inches)				
						SORSS	ABUTH	AMATA	CHEAL	CORN
May 19	61	67	8 S	7:26 am	V2	1.5	1.0	1.0	0.5	3.0

Table 2. Rainfall received 10 days before and after herbicide application.

Appl. Date (May 19)	Amount (in)
May 10	0.11
May 13	0.03
May 15	0.03
May 23	0.17
May 26	0.17

Table 3. Residual activity of postemergence HPPD-inhibitor herbicides (S0914)

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	AMATA 6/8/2009 COUPLA FT2 20 DAT	ABUTH 6/8/2009 COUPLA FT2 20 DAT	CHEAL 6/8/2009 COUPLA FT2 20 DAT	SETFA 6/8/2009 COUPLA FT2 20 DAT	AMATA 6/22/2009 COUPLA FT2 34 DAT	CHEAL 6/22/2009 COUPLA FT2 34 DAT	SETFA 6/22/2009 COUPLA FT2 34 DAT	ABUTH 6/22/2009 COUPLA FT2 34 DAT	CORN 10/27/2009 YIELD bu/A
1	Roundup PowerMAX	27	FL OZ/A	eapocr	3	3	0	3	10	1	12	3	238.0
1	AMS	17	LB AI/100 GAL	eapocr									
2	Roundup PowerMAX	27	FL OZ/A	eapocr	1	4	0	2	4	0	8	3	237.8
2	AMS	17	LB AI/100 GAL	eapocr									
2	Aatrex 90 DF	0.555	LB/A	eapocr									
3	Roundup PowerMAX	27	FL OZ/A	eapocr	1	3	0	4	6	1	10	2	237.9
3	AMS	17	LB AI/100 GAL	eapocr									
3	Laudis	3	FL OZ/A	eapocr									
4	Roundup PowerMAX	27	FL OZ/A	eapocr	2	2	0	3	6	0	7	1	233.3
4	AMS	17	LB AI/100 GAL	eapocr									
4	Impact	0.75	FL OZ/A	eapocr									
5	Roundup PowerMAX	27	FL OZ/A	eapocr	0	1	0	2	3	0	7	0	243.4
5	AMS	17	LB AI/100 GAL	eapocr									
5	Callisto	3	FL OZ/A	eapocr									
6	Roundup PowerMAX	27	FL OZ/A	eapocr	1	2	0	2	10	1	8	1	249.1
6	AMS	17	LB AI/100 GAL	eapocr									
6	Status	5	OZ/A	eapocr									
7	Roundup PowerMAX	27	FL OZ/A	eapocr	0	3	0	2	2	0	6	2	250.2
7	AMS	17	LB AI/100 GAL	eapocr									
7	Laudis	3	FL OZ/A	eapocr									
7	Aatrex 90 DF	0.555	LB/A	eapocr									

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8	Roundup PowerMAX	27	FL OZ/A	eapocr	1	2	0	3	4	0	8	1	243.8
8	AMS	17	LB AI/100 GAL	eapocr									
8	Impact	0.75	FL OZ/A	eapocr									
8	Aatrex 90 DF	0.555	LB/A	eapocr									
9	Roundup PowerMAX	27	FL OZ/A	eapocr	0	0	0	2	2	0	6	0	247.4
9	AMS	17	LB AI/100 GAL	eapocr									
9	Callisto	3	FL OZ/A	eapocr									
9	Aatrex 90 DF	0.555	LB/A	eapocr									
10	Roundup PowerMAX	27	FL OZ/A	eapocr	1	4	0	1	3	0	5	3	250.4
10	AMS	17	LB AI/100 GAL	eapocr									
10	Status	5	OZ/A	eapocr									
10	Aatrex 90 DF	0.555	LB/A	eapocr									
11	Untreated				19	4	3	6	10	7	5	1	68.3
LSD (P=.05)					1.7	1.5	2	2.1	4.4	3.2	5	1.3	19.01