Evaluation of Cultivation Programs in Field Corn at Rochester, MN in 2018.

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The objective of this trial was to compare weed control of a POST cultivation to a POST herbicide treatment in field corn in southeastern Minnesota. The research site was a loamy sand series with a pH of 6.7, O.M. of 2.1%, and soil test P and K levels of 29 ppm and 167 ppm, respectively. Spring fertilizer was broadcast on April 30, 2018 at a rate of 120-52-120-24 lbs/A (N-P-K-S) lbs/A. The field was disked and field cultivated once prior to planting. The previous crop was soybean. The corn hybrid, DEKALB DKC51-38RIB, was planted May 7, 2018 at a depth of 1.5 inches in 30-inch rows at a rate of 32,000 seeds per acre. A randomized complete block design was used with four replications. Preemergence (PRE) treatments were applied with a tractor-mounted sprayer delivering 15 gpa at 40 psi using TTI-110015 and postemergence (POST) treatments were applied with TurboTee 110015 tips. POST herbicide application and cultivation were applied on June 1, 2018. Post herbicide treatment consisted of 32 fl oz/a of Liberty + 16 fl oz/a of Aatrex + 3 qt/a of N-Pa-K AMS. Cultivation was done with a 4-row John Deere inter-row crop cultivator with fixed shovels. Evaluations of the plots were made on May 25, June 11 and August 30, 2018. The center two rows of each plot were machine harvested on November 1, 2018. Application dates, environmental conditions and weed stages are in Table 1. Performance ratings for giant ragweed, common lambsquarters, common waterhemp, grass control, and crop response are in Table 2.

DISCUSSION

The goal of this project was to compare the weed control of a POST cultivation to a POST herbicide treatment in either a weaker PRE program (e.g. Outlook) or a stronger PRE program (e.g. Verdict). Weed control of common lambsquarters, waterhemp, or grass was greater than 95% regardless of herbicide or cultivation treatment. However, Verdict herbicide provided better preemergence weed control of giant ragweed than Outlook herbicide (Table 2). A POST Liberty/Aatrex treatment in the Outlook system was superior to the cultivation treatment, providing 98% control of giant ragweed versus 78% control, respectively. If cultivation is to be used as the primary POST weed control and giant ragweed is present, one should start with a "stronger" or more effective preemergence herbicide program to ensure adequate control of giant ragweed. (University of Minnesota Extension Regional Office, Rochester.)

Table 1. Application timing, plant stage, environmental conditions.

Date	**5/8**	**6/1**	**6/1**
Treatment	PRE (A)	POST I (B)	POST I (C) = Cultivation
Temperature (F)			
Air	72	81	81
Soil	59.9	75.6	75.6
Relative Humidity (%)	37	62	62
Wind (mph)	17	9	9
Soil Moisture	Normal	Normal	Normal
Giant Ragweed			
Weed Density (ft^2)	0	4	4
Height (in)	0.0	2.75	2.75
Common Waterhemp			
Weed Density (ft^2)	0	10	10
Height (in)	0.0	1.0	1.0
Common Lambsquarter			
Weed Density (ft^2)	0	16	16
Height (in)	0.0	1.0	1.0
Grass			
Weed Density (ft^2)	0	2	2
Height (in)	0.0	2.0	2.0
Rainfall after each application (inch)			
Week 1	2.33	0.51	0.51
Week 2	0.35	0.42	0.42
Week 3	0.77	3.05	3.05

Table 2. Control of giant ragweed (AMBTR), common lambsquarters (CHEAL), common waterhemp (AMATA) and grasses with herbicides systems with and without post cultivation in field corn at Rochester, MN in 2018.

Trt	Treatment	Rate		Appl	AMBTR GIANT RAGWEED May-25-2018	AMBTR GIANT RAGWEED Jun-11-2018	AMBTR GIANT RAGWEED Aug-30-2018	CHEAL Aug-30-2018	AMATA Aug-30-2018	GRASS Aug-30-2018	YIELD Nov-1-2018
Pest Code											
Rating Date											
					PERCENT CONTROL (%)						BU/A
PRE (5/8/18) / POST I (B and C) (6/1/18)											
1	SOA 5,10,14,15				97 a	99 a	98 a	99 a	99 a	99 a	195.5 a
	VERDICT	15	oz/a	A							
	LIBERTY 280	32	fl oz/a	B							
	AATREX	16	fl oz/a	B							
	N-Pa-K AMS	3	qt/a	B							
2	SOA 14,15				95 a	96 a	96 a	98 ab	99 a	99 a	177.2 a
	VERDICT	15	oz/a	A							
	CULTIVATION			C							
3	SOA 5,10,15				60 b	99 a	98 a	99 a	99 a	99 a	181.5 a
	OUTLOOK	16	fl oz/a	A							
	LIBERTY 280	32	fl oz/a	B							
	AATREX	16	fl oz/a	B							
	N-Pa-K AMS	3	qt/a	B							
4	SOA 15				59 b	74 b	78 b	96 b	99 a	99 a	144.1 b
	OUTLOOK	16	fl oz/a	A							
	CULTIVATION			C							
LSD P=.10					2.1	3.4	2.9	2.0	0.4	0.4	13.5