

## Evaluation of HPPD Inhibiting Herbicides (Realm Q, Lumax and mesotrione) in Field Corn at Rochester, MN in 2012.

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The objective of this trial was to evaluate and compare weed control performance of HPPD inhibiting herbicides - Realm Q, Lumax and the active ingredient mesotrione in field corn in southeastern Minnesota. The research site was a Lawler loam series with a pH of 6.6, O.M. of 2.4%, and soil test P and K levels of 39 ppm and 113 ppm, respectively. Spring fertilizer was broadcast ahead of planting on March 30, 2012 at a rate of 135-26-150-24 (N-P-K-S). The field was spring disked and field cultivated once prior to planting. The corn hybrid, Pioneer P9917 AM1 (99 day), was planted on April 26, 2012 at a depth of 1.5 inches in 30 inch rows at 32,000 seeds per acre. A randomized complete block design was used with four replications. Preemergence (PRE) treatments were applied on April 26, 2012, and postemergence (POST) treatments were applied on May 24, 2012 with a tractor-mounted sprayer delivering 20 gpa at 32 psi using Turbo Tee 11002 nozzles. Evaluations of the plots were taken on May 24, 29, June 4, 14, and August 8. The center two rows of each plot were machine harvested on October 2. Application dates, environmental conditions, and weed stages are listed in Table 1. Herbicide performance ratings for giant ragweed, common lambsquarters, common waterhemp and giant foxtail control, plus plant injury ratings can be found in Tables 2 through 6, respectively. (University of Minnesota Extension Regional Office – Rochester)

**Summary:** Excellent pre-emergence giant ragweed control was achieved with Lumax and the tank mix treatment of rimsulfuron + mesotrione + BreakFree ATZ LITE (98-96%, 5/24 rating). Rimsulfuron + mesotrione + BreakFree at 2.25 pt/a and 1.25 pt/a and rimsulfuron + mesotrione provide very good control of giant ragweed (95-92%, 5/24 rating). Greatly reduced giant ragweed control was achieved with rimsulfuron + BreakFree ATZ LITE (77%, 5/24). Final giant ragweed control was very consistent for all treatments. Two treatments did provide slightly reduced control of giant ragweed, rimsulfuron + mesotrione + BreakFree at 1.25 pt/a and rimsulfuron + BreakFree ATZ LITE (95 and 93%, respectively, 8/8 rating).

The only differences for common lambsquarters were during the final rating. Rimsulfuron + mesotrione + BreakFree at 1.25 pt/a and rimsulfuron + BreakFree ATZ LITE offered slightly reduced control (97 and 91%, respectively, 8/8 rating).

Common waterhemp control was excellent for all treatments.

Pre-emergent giant foxtail control was consistently excellent with the exception of the rimsulfuron + mesotrione treatment (91%, 5/24). The same rimsulfuron + mesotrione treatment followed by rimsulfuron + mesotrione + isoxadifen and the rimsulfuron + mesotrione + BreakFree at 1.25 pt/a followed by Abundit Extra also provided slightly reduced final giant foxtail control (96%, 8/8 rating).

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

<b>Date</b>	<b>4/26</b>	<b>5/24</b>
<b>Treatment</b>	PRE	POST I
<b>Temperature (F)</b>		
Air	54	79
Soil	59	76
<b>Relative Humidity (%)</b>	38	52
<b>Wind (mph)</b>	16	25
<b>Soil Moisture</b>	Normal	Normal
<b>Corn</b>		
Stage		4-collar
Height (inch)		6.0
<b>Giant Ragweed</b>		
Weed density (ft <sup>2</sup> )		4.5
Height (inch)		3.0
<b>Common Lambsquarters</b>		
Weed density (ft <sup>2</sup> )		5.8
Height (inch)		1.0
<b>Common Waterhemp</b>		
Weed density (ft <sup>2</sup> )		4.3
Height (inch)		0.9
<b>Giant Foxtail</b>		
Weed density (ft <sup>2</sup> )		5.3
Height (inch)		1.9
<b>Rainfall after each application (inch)</b>		
Week 1	1.28	2.08
Week 2	1.68	0.08
Week 3	0.00	0.80

Preemergence treatments provided very slight crop injury. This was likely due to significant rainfall events following application. The crop quickly recovered and was undetectable after the 5/29 rating date.

**Table 2. Evaluation of HPPD inhibiting herbicides for giant ragweed control in field corn on May 24, 29, June 4, 14 and August 8 at Rochester, MN, in 2012.**

Treatment	Rate	Giant Ragweed Control					Yield 10/2
		5/24	5/29	6/4	6/14	8/8	
	(rate/A)	(%)					(bu/A)
Untreated Check		0	0	0	0	0	5
<b>PRE (After Planting) / POST I (V3-V5 Corn)</b>							
rimsulfuron* + mesotrione** / Realm Q (rimsulfuron + mesotrione +isoxadifen-ethyl***) + Abundit Extra + AMS	0.25 oz/a + 2.5 oz/a / 4 oz/a (0.3 oz/a + 2.5 oz/a + 0.15 oz/a) + 32 fl oz/a + 2 lb/a	92	98	98	99	99	121
rimsulfuron + BreakFree ATZ LITE / Abundit Extra + AMS	0.25 oz/a + 3 pt/a / 32 fl oz/a + 2 lb/a	77	94	97	97	93	134
rimsulfuron + mesotrione + BreakFree ATZ LITE / Abundit Extra + AMS	0.25 oz/a + 2.5 oz/a + 4 pt/a / 32 fl oz/a + 2 lb/a	96	98	98	98	97	160
rimsulfuron + mesotrione + BreakFree / Abundit Extra + AMS	0.25 oz/a + 2.5 oz/a + 1.25 pt/a / 32 fl oz/a + 2 lb/a	94	98	97	97	95	138
rimsulfuron + mesotrione + BreakFree / Abundit Extra + AMS	0.25 oz/a + 2.5 oz/a + 2.25 pt/a / 32 fl oz/a + 2 lb/a	95	98	98	98	98	127
Lumax / Abundit Extra + AMS	2.5 qt/a / 32 fl oz/a + 2 lb/a	98	99	98	99	99	96
	<b>LSD (P=0.10)</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>43</b>

\*rimsulfuron = 25% dry granule

\*\*mesotrione = 50% dry granule

\*\*\* Isoxadifen-Ethyl = 50% dry granule

**Table 3. Evaluation of HPPD inhibiting herbicides for common lambsquarters control in field corn on May 24, 29, June 4, 14 and August 8 at Rochester, MN, in 2012.**

Treatment	Rate	Common Lambsquarters Control					Yield 10/2
		5/24	5/29	6/4	6/14	8/8	
	(rate/A)	(%)					(bu/A)
Untreated Check		0	0	0	0	0	5
<b>PRE (After Planting) / POST I (V3-V5 Corn)</b>							
rimsulfuron* + mesotrione** / Realm Q (rimsulfuron + mesotrione +isoxadifen-ethyl***) + Abundit Extra + AMS	0.25 oz/a + 2.5 oz/a / 4 oz/a (0.3 oz/a + 2.5 oz/a + 0.15 oz/a) + 32 fl oz/a + 2 lb/a	99	99	99	99	99	121
rimsulfuron + BreakFree ATZ LITE / Abundit Extra + AMS	0.25 oz/a + 3 pt/a / 32 fl oz/a + 2 lb/a	99	99	99	98	91	134
rimsulfuron + mesotrione + BreakFree ATZ LITE / Abundit Extra + AMS	0.25 oz/a + 2.5 oz/a + 4 pt/a / 32 fl oz/a + 2 lb/a	99	99	99	99	99	160
rimsulfuron + mesotrione + BreakFree / Abundit Extra + AMS	0.25 oz/a + 2.5 oz/a + 1.25 pt/a / 32 fl oz/a + 2 lb/a	99	99	99	99	97	138
rimsulfuron + mesotrione + BreakFree / Abundit Extra + AMS	0.25 oz/a + 2.5 oz/a + 2.25 pt/a / 32 fl oz/a + 2 lb/a	99	99	99	99	99	127
Lumax / Abundit Extra + AMS	2.5 qt/a / 32 fl oz/a + 2 lb/a	99	99	99	99	99	96
	<b>LSD (P=0.10)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>43</b>



**Table 6. Crop response to HPPD inhibiting herbicides in field corn on May 24, 29, and June 18, at Rochester, MN, in 2012.**

Treatment	Rate	Injury		Plant Height	Yield
		5/24	5/29	6/18	10/2
	(rate/A)	(% )		(in)	(bu/A)
Untreated Check		0	0	36	5
<b>PRE (After Planting) / POST I (V3-V5 Corn)</b>					
rimsulfuron* + mesotrione** / Realm Q ( rimsulfuron + mesotrione +isoxadifen-ethyl***) + Abundit Extra + AMS	0.25 oz/a + 2.5 oz/a / 4 oz/a (0.3 oz/a + 2.5 oz/a + 0.15 oz/a) + 32 fl oz/a + 2 lb/a	4	6	46	121
rimsulfuron + BreakFree ATZ LITE / Abundit Extra + AMS	0.25 oz/a + 3 pt/a / 32 fl oz/a + 2 lb/a	10	3	48	134
rimsulfuron + mesotrione + BreakFree ATZ LITE / Abundit Extra + AMS	0.25 oz/a + 2.5 oz/a + 4 pt/a / 32 fl oz/a + 2 lb/a	9	4	45	160
rimsulfuron + mesotrione + BreakFree / Abundit Extra + AMS	0.25 oz/a + 2.5 oz/a + 1.25 pt/a / 32 fl oz/a + 2 lb/a	5	3	50	138
rimsulfuron + mesotrione + BreakFree / Abundit Extra + AMS	0.25 oz/a + 2.5 oz/a + 2.25 pt/a / 32 fl oz/a + 2 lb/a	13	4	46	127
Lumax / Abundit Extra + AMS	2.5 qt/a / 32 fl oz/a + 2 lb/a	4	1	50	96
	<b>LSD (P=0.10)</b>	<b>4</b>	<b>3</b>	<b>6</b>	<b>40</b>