

## Evaluation of Callisto<sup>®</sup> based herbicide programs in conventional, Liberty Link<sup>®</sup> and RR<sup>®</sup>/GT for weed control in field corn at Rochester, MN in 2006.

Behnken, Lisa M., Fritz R. Breitenbach, Daniel J. Hartmann, and Corey W. Stever.

The objective of this trial was to evaluate Callisto<sup>®</sup> based herbicide programs in conventional, Liberty Link<sup>®</sup> and RR<sup>®</sup>/GT corn for weed control in field corn in southeastern Minnesota. The research site was a Lawler loam series with a pH of 7.1 and soil test P and K levels of 51 ppm and 185 ppm, respectively. Spring fertilizer was spread ahead of planting on April 20, at a rate of 109-19-85-24 (N-P-K-S). The area was side dressed with an additional 30 lb/A of N on June 7. The field was chisel plowed, spring disked, and field cultivated once prior to planting. The corn hybrid NK N38B4, was planted on April 24, 2006 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) and postemergence (POST) treatments were applied with a tractor-mounted sprayer delivering 20 gpa at 32 psi using Turbo Tee 11002 nozzles. Evaluations of the plots were taken on May 23, May 30, June 9 and June 28. Application dates, environmental conditions, and weed stages are listed below. The center two rows of each plot were harvested on November 2, 2006.

Date	April 25	May 24	May 31	June 19
<b>Treatment</b>	PRE	POST I	POST II	POST III
<b>Temperature (F)</b>				
air	51	83	78	76
soil	56.5	70.5	71.8	79.7
<b>Relative Humidity (%)</b>	33	47	34	44
<b>Wind (mph)</b>	16	23	13	16
<b>Soil moisture</b>	adequate	dry	dry	adequate
<b>Corn</b>				
stage	--	V2	4 collar	V4
height (inch)	--	3.5	8.0	8.5
<b>Giant Ragweed</b>				
weed density (ft <sup>2</sup> )	--	31.4	31.4	31.4
height (inch)	--	3.2	7.5	6.0
<b>Common Lambsquarters</b>				
weed density (ft <sup>2</sup> )	--	7.3	7.3	7.3
height (inch)	--	1.2	1.5	1.25
<b>Common Waterhemp</b>				
weed density (ft <sup>2</sup> )	--	88.3	88.3	88.3
height (inch)	--	0.4	0.3	1.25
<b>Giant Foxtail</b>				
weed density (ft <sup>2</sup> )	--	0.1	0.1	0.1
height (inch)	--	1.4	1.3	--
<b>Rainfall after each application (inch)</b>				
week 1	1.02	0.35	0.41	0.43
week 2	0.09	0.41	2.13	0.00
week 3	1.36	2.13	0.26	0.12

### **CONCLUSIONS**

**PRE:** Lumax<sup>®</sup> provided excellent weed control. Giant ragweed control slipped slightly by the 6/28 rating to 92% control. Grain yield was 168 bushels per acre (statistically not different from the highest yielding treatment in the trial).

**PRE/POST I:** The only PRE/POST I treatment was a split application of Lumax<sup>®</sup>. This sequential Lumax<sup>®</sup> treatment provided excellent weed control throughout the duration of the trial. Grain yield was 169 bushels per acre (statistically not different from the highest yielding treatment in the trial). The split application of Lumax<sup>®</sup> also performed similarly to the single preemergence application of Lumax<sup>®</sup> both in weed control and corn yield.

**PRE/POST II:** PRE/POST II treatments made up the majority of the treatments in the trial. PRE/POST II treatments providing early season giant ragweed control was the key to maximizing corn yields in this trial. Preemergence herbicide treatments that provided at least 60% control on the 5/23 rating maximized corn yields of 166 and 167 bushels per acre and were not statistically different from the highest yielding treatment in the trial. Herbicide treatments with Lumax<sup>®</sup> or Harness Xtra<sup>®</sup> were the only preemergence treatments in this trial which provided 60% or better control of giant ragweed on the 5/23 rating. Preemergence applications of

Surpass<sup>®</sup> or Outlook<sup>®</sup> provided minimal giant ragweed control, 41 and 30%, respectively. Preemergence applications with Dual II Magnum<sup>®</sup> or Define<sup>®</sup> provided no giant ragweed control.

Differences in common lambsquarters control were also evident among the preemergence herbicides (5/23 rating date). Preemergence applications of Lumax<sup>®</sup> or Harness Xtra<sup>®</sup> resulted in the best, 99% control. Preemergence application of Surpass<sup>®</sup> resulted in 88% control of common lambsquarters, and preemergence applications of Dual II Magnum<sup>®</sup>, Define<sup>®</sup>, or Outlook<sup>®</sup> provided common lambsquarters control in the 36-40% range.

Several of the PRE/POST II treatments failed to provide season long weed control in this trial (6/28 rating date). Surpass<sup>®</sup> followed by Hornet<sup>®</sup> and AAtrex<sup>®</sup> resulted in giant ragweed control of 73%, which likely contributed to the lower grain yield of 115 bushels per acre. Common lambsquarters control was also slightly diminished in the Dual II Magnum<sup>®</sup> followed by Touchdown Total<sup>®</sup>, 93%, and the Outlook<sup>®</sup> followed by Distinct<sup>®</sup> plus Roundup WeatherMax<sup>®</sup>, 92%. Common waterhemp control was also impacted with the Define<sup>®</sup> followed by Liberty<sup>®</sup> plus AAtrex<sup>®</sup> and Outlook<sup>®</sup> followed by Distinct<sup>®</sup> plus AAtrex<sup>®</sup>, both resulting in 84% control. Distinct plus Roundup WeatherMax<sup>®</sup> resulted in 87% control of common waterhemp and Harness Xtra<sup>®</sup> followed by Roundup WeatherMax<sup>®</sup> gave 91% control.

**POST I:** The best POST I application in this trial, based on corn grain yield, was the Lumax<sup>®</sup> plus Liberty<sup>®</sup> tank mix which yielded 187 bushels per acre. Weed control (burn down) was extremely quick with this combination of herbicides. This quick burn down coupled with the droughty growing conditions provided less weed competition with the crop than the other POST I treatments containing slower acting glyphosate combinations. In addition, this treatment provided excellent residual weed control for the duration of the trial (6/28). Although the Lumax<sup>®</sup> plus Touchdown Total<sup>®</sup> application at POST I did not maximize grain yield it did provide excellent season long weed control. The same cannot be said for the rest of the POST I treatments. Camix<sup>®</sup> tank mixed with Touchdown Total<sup>®</sup> provided excellent weed control except for the 6/28 rating for common waterhemp, 82% control. Roundup WeatherMax<sup>®</sup> tank mixed with Resolve<sup>®</sup>, or with Resolve<sup>®</sup> and AAtrex<sup>®</sup> also provided very good weed control with the exception of common waterhemp on the 6/28 rating, which resulted in 72 and 73%, respectively.

**POST II:** A single POST II application of Roundup WeatherMax<sup>®</sup> resulted in very good giant ragweed and giant foxtail control, 94 and 99%, respectively, by the 6/28 rating. However, common lambsquarters and common waterhemp control was only 83 and 62%, respectively (6/28 rating date). Grain yield was dramatically reduced due to early and late season weed competition and resulted in a yield of 77 bushels per acre.

**POST II/POST III:** A sequential application of Roundup WeatherMax<sup>®</sup> at both POST II and POST III resulted in excellent weed control on the 6/28 rating date. Grain yield was not maximized, however, due to increased early season weed competition primarily from giant ragweed. Grain yield for this treatment was 157 bushels per acre, statistically lower than the maximum grain yield for this trial. (University of Minnesota Extension Service, Regional Center, Rochester, MN).

**Table. Evaluation of Callisto® based herbicide programs in conventional, Liberty Link® and RR®/GT for weed control in corn on May 23, May 30, June 9, and June 28 at Rochester, MN in 2006.**

Treatment	Rate	Giant ragweed control				Common lambsquarters control				Common waterhemp control				Giant foxtail control				Corn yield (bu/A)
		5/23	5/30	6/9	6/28	5/23	5/30	6/9	6/28	5/23	5/30	6/9	6/28	5/23	5/30	6/9	6/28	
	(rate/A)	(%)				(%)				(%)				(%)				
Untreated Check		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
<b>PRE</b>																		
Lumax	2.5 qt	88	87	97	92	99	99	99	99	99	97	98	99	99	98	99	99	168
<b>PRE / POST I</b>																		
Lumax / Lumax + Adspray 90 NIS	1.5 qt / 1 qt + 0.25% v/v	85	94	97	97	99	99	99	99	99	97	99	99	99	98	99	99	169
<b>PRE / POST II</b>																		
Dual II Magnum / Callisto + AAtrex + Agri-Dex COC + AMS	1.33 pt / 3 oz + 1 pt + 1% v/v + 1% v/v	0	0	92	99	40	31	97	97	99	89	98	99	99	98	99	99	144
Surpass / Hornet + AAtrex + Agri-Dex COC + AMS	2 pt / 3 oz + 1 pt + 1% v/v + 1% v/v	41	36	78	73	88	73	99	98	99	99	99	98	99	99	99	99	115
Outlook / Distinct + AAtrex + Adspray 90 NIS + AMS	14 oz / 4 oz + 1 pt + 0.25% v/v + 1% v/v	30	23	81	96	38	36	99	96	99	98	99	88	99	96	99	99	156
Lumax / Liberty + AMS	1.5 qt / 24 oz + 1% v/v	85	81	98	95	99	99	99	98	99	95	99	97	99	99	99	99	167
Define / Liberty + AAtrex + AMS	10 oz /32 oz + 1 pt + 1% v/v	0	0	93	96	36	34	98	97	98	89	98	84	99	99	99	99	113
Dual II Magnum / Touchdown Total + AMS	1.33 pt / 24 oz + 1%v/v	0	0	74	94	40	38	93	93	99	80	98	95	99	99	99	99	121
Dual II Magnum / Touchdown Total + Callisto + AMS	1.33 pt / 24 oz + 3 oz + 1% v/v	0	0	69	97	38	36	99	98	99	96	98	99	99	99	99	98	141

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		5/23	5/30	6/9	6/28	5/23	5/30	6/9	6/28	5/23	5/30	6/9	6/28	5/23	5/30	6/9	6/28	
	(rate/A)	(%)				(%)				(%)				(%)				
Lumax / Touchdown Total + AMS	1.5 qt / 24 oz + 1% v/v	85	91	99	97	99	99	99	98	99	97	99	98	99	99	99	99	166
Harness Xtra / Roundup WeatherMax + AMS	1 qt / 22 oz + 1% v/v	60	45	83	96	99	92	99	97	99	96	99	91	99	93	99	99	167
Outlook / Distinct + Roundup WeatherMax + AMS	14 oz / 4 oz + 11 oz + 1% v/v	30	20	80	97	38	40	97	92	99	92	95	87	99	99	99	98	148
<b>POST I</b>																		
Lumax + Liberty + AMS	1.5 qt + 24 oz + 1% v/v	0	91	98	95	0	99	99	99	0	90	97	90	0	99	99	99	187
Lumax + Touchdown Total + AMS	1.5 qt + 24 oz + 1% v/v	0	88	98	96	0	99	99	99	0	97	99	96	0	98	99	99	158
Camix + Touchdown Total + AMS	1.2 qt + 24 oz + 1% v/v	0	81	95	92	0	92	99	96	0	88	97	82	0	99	99	99	152
Roundup WeatherMax + Resolve + AMS	22 oz + 1 oz + 1% v/v	0	70	85	87	0	89	95	91	0	68	95	72	0	95	99	98	147
Roundup WeatherMax + Resolve + AAtrex + AMS	22 oz + 1 oz + 1 pt + 1% v/v	0	66	90	93	0	90	99	98	0	63	94	73	0	99	99	99	158
<b>POST II</b>																		
Roundup WeatherMax + AMS	22 oz + 1% v/v	0	0	72	94	0	0	87	83	0	0	95	62	0	0	99	99	77
<b>POST II / POST III</b>																		
Roundup WeatherMax + AMS / Roundup WeatherMax + AMS	22 oz + 1% v/v / 22 oz + 1% v/v	0	0	74	99	0	0	85	97	0	0	89	98	0	0	99	99	157
<b>LSD (P=0.10)</b>		<b>1</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>0.3</b>	<b>1</b>	<b>22</b>