

Wheat and barley response to various postemergence herbicides at Rosemount, MN - 1999.

Durgan, Beverly R. and Douglas Miller This experiment was designed to evaluate wheat and barley tolerance to various postemergence herbicides. The experiment was conducted at Rosemount, MN on a Waukegon silt loam soil. Following soybeans, the experimental area was fall chisel plowed. In the spring, the area received 50 lbs/A N then was disked, field cultivated, and harrowed. 'AC Barrie', 'Forge', Gunner', 'HJ98', 'Ingot', 'Ivan', 'McVey', 'Oxen', 'Sharpshooter', 'Verde', and '2375" hard red spring wheat varieties, plus 'MN Brite' and 'Stander' barley varieties were seeded on April 29 at 85 lb/A and 90 lbs/A for wheat and barley, respectively. Propachlor at 2.5 lbs ai/A was applied preemergence on May 3 to control grassy weeds. Bromoxynil at 0.25 lba ai/A was applied postemergence on May 27 to control broadleaf weeds. All herbicide treatments were applied to a 7.5 ft strip with a tractor mounted sprayer delivering 10 gpa at 35 psi using 8001 flat fan nozzles. The experimental design was a split block with three replications. Varieties were seeded in strips randomized within each replication. Herbicide treatments were applied across all ten varieties. Each herbicide x variety plot was 10 feet wide by 17 feet long. Herbicide treatments were applied May 22 and June 2. Environmental conditions at application are listed below. Crop injury was rated visually on June 1, June 23, and July 10. Crop height was measured at maturity and yields taken. Data were summarized by variety and are presented in Tables 1-7.

Treatment Date	May 22	June 2
Target crop stage	3-4 leaf	4-5 leaf
Temperature (°F)		
air	68	62
soil	--	69
Relative Humidity (%)	55	55
Soil Moisture	moist	moist at 0.5"
Wind (mph)	3-5 SSW	1-5 NE
Sky	clear	10% clouds
Rainfall before application		
Week 1 (inch)	2.11	0.22
Rainfall after application		
Week 1 (inch)	0.37	0.81
Week 2 (inch)	0.24	1.63

Barley

Stander		
leaf no.	3.75	5.75-6.25
height (inch)	5-8	10-12
tillers	1	2-3
MN Brite		
leaf no.	3.75-4	5.75-6.25
height (inch)	5-7	10-13
tillers	2	1-3

Wheat

AC Barrie		
leaf no.	4.5	5.25-5.75
height (inch)	5-7	8-10
tillers	2-3	2-4
Forge		
leaf no.	4.75	5.25-5.5
height (inch)	5-7	8-11
tillers	2-3	2-3
Gunner		
leaf no.	3.5	5.5-5.75
height (inch)	3-5	7-10
tillers	2	3-4

Treatment Date	May 22	June 2
Target crop stage	3-4 leaf	4-5 leaf
<u>Wheat (cont.)</u>		
HJ98		
leaf no.	3.5	5.25-5.75
height (inch)	4-6	8-10
tillers	1-2	3-4
Ingot		
leaf no.	3.5-3.75	5.5-5.75
height (inch)	4-6	8-11
tillers	1-2	3-4
Ivan		
leaf no.	3	5.25-6.75
height (inch)	4-6	7-10
tillers	1	3-4
McVey		
leaf no.	3.25	5.75
height (inch)	4-6	8-11
tillers	1	3-4
Oxen		
leaf no.	3.5	5.5-5.75
height (inch)	4-6	7-9
tillers	1	3-4
Sharpshooter		
leaf no.	4	5.5-6
height (inch)	4-6	7-10
tillers	2	3-4
Verde		
leaf no.	3-3.5	4.75-6.25
height (inch)	3-5	6-9
tillers	2	2-4
2375		
leaf no.	3.75	5.5-5.75
height (inch)	4-6	8-11
tillers	2	2-3

The CGA 184927 and fenoxaprop treatments exhibited slight to moderate injury symptoms in the wheat varieties. Generally, CGA 184927 and fenoxaprop & safener caused the least injury, followed by fenoxaprop & MCPA + thifensulfuron & tribenuron, and fenoxaprop & 2,4-D & MCPA usually showing the most. Some varieties showed a yield reduction with the fenoxaprop & MCPA + thifensulfuron & tribenuron treatment, but no consistent trend was apparent. Fenoxaprop & MCPA + thifensulfuron & tribenuron caused injury in the barley varieties and decreased yields of 'Stander' Barley. CGA 184927 caused severe injury in barley. This injury was most apparent at the later rating dates. 'Stander' yields were reduced significantly by CGA 184927 while those of 'MN Brite' were not. The high rate of tralkoxydim produced moderate injury to wheat and barley early on, but symptoms decreased with time and yields were not affected. MKH-6562 treatments also showed moderate injury symptoms at the first rating date in wheat and barley. Injury symptoms decreased with time in wheat but remained the same in barley. 'Stander' barley yields were significantly reduced by MKH 6562. Difenzoquat caused severe injury and yield reductions to 'Gunner' and 'Verde' wheat. 'Ivan' also exhibited high injury symptoms and some yield loss. Injury to barley and the other wheat varieties was light to moderate depending on the difenzoquat rate and yields were not affected. (Department of Agronomy and Plant Genetics, University of Minnesota, St. Paul).

Table 1. Hard red spring wheat tolerance to postemergence herbicides at Rosemount, MN -1999 (Durgan and Miller).

Treatment	Rate (lb/A)	2375					HJ98				
		Injury			Height inch	Yield Bu/A	Injury			Height inch	Yield Bu/A
		6/1	6/23	7/10			6/1	6/23	7/10		
<u>Postemergence (May 22)</u>											
Fenoxaprop & safener <sup>1</sup>	0.104	5	7	7	29	26	5	3	5	29	33
Fenoxaprop & safener	0.208	12	8	8	31	26	12	7	8	30	31
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	10	8	10	30	24	10	5	8	29	31
Tralkoxydim + COC	0.36 + 0.5%	22	13	8	30	28	22	7	8	29	30
MKH 6562 + NIS <sup>3</sup>	0.027 + 0.25%	17	12	10	30	25	17	10	10	28	30
MKH 6562 + NIS	0.054 + 0.25%	20	15	18	30	27	20	12	17	27	29
Fenoxaprop & MCPA <sup>4</sup> + thifensulfuron & tribenuron <sup>5</sup>	0.09 & 0.37 + 0.009 & 0.005	12	13	10	31	28	15	10	10	30	28
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	17	15	10	31	27	17	10	10	28	28
CGA 184927 & safener <sup>6</sup> + surf <sup>7</sup>	0.05 + 0.8%	10	12	10	30	25	10	8	10	27	27
CGA 184927 & safener + surf	0.1 + 0.8%	10	13	23	31	26	10	8	8	28	31
Check		0	0	0	30	28	0	0	0	28	31
<u>Postemergence (June 2)</u>											
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.09 & 0.37 + 0.009 & 0.005	--	13	10	29	24	--	8	17	27	28
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	--	18	13	30	26	--	12	10	27	29
Difenzoquat	0.75	--	13	13	30	24	--	10	12	27	29
Difenzoquat	1.0	--	22	27	29	22	--	22	23	27	27
Difenzoquat	1.5	--	38	23	27	15	--	35	23	27	22
Imazamethabenz <sup>8</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	--	13	10	28	26	--	13	10	29	30
Fenoxaprop & 2,4-D & MCPA <sup>9</sup>	0.0921 & 0.121 & 0.366	--	22	15	29	25	--	20	15	28	27
Fenoxaprop & 2,4-D & MCPA	0.138 & 0.182 & 0.549	--	18	13	30	28	--	22	13	28	27
Check		--	0	0	30	25	--	0	0	29	32
<u>LSD (P=.05)</u>		5	9	12	ns	3	6	8	9	2	5

Table 2. Hard red spring wheat tolerance to postemergence herbicides at Rosemount, MN -1999 (Durgan and Miller).

Treatment	Rate (lb/A)	Oxen					Gunner				
		Injury			Height inch	Yield Bu/A	Injury			Height inch	Yield Bu/A
		6/1	6/23	7/10			6/1	6/23	7/10		
<u>Postemergence (May 22)</u>											
Fenoxaprop & safener <sup>1</sup>	0.104	5	3	7	27	29	5	7	10	30	23
Fenoxaprop & safener	0.208	12	10	8	27	29	12	12	8	31	21
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	10	10	10	26	29	10	10	10	30	19
Tralkoxydim + COC	0.36 + 0.5%	22	8	8	27	29	22	8	8	31	20
MKH 6562 + NIS <sup>3</sup>	0.027 + 0.25%	17	10	10	26	29	17	10	10	32	20
MKH 6562 + NIS	0.054 + 0.25%	22	12	15	26	30	22	12	15	31	22
Fenoxaprop & MCPA <sup>4</sup> + thifensulfuron & tribenuron <sup>5</sup>	0.09 & 0.37 + 0.009 & 0.005	12	10	10	27	31	12	10	10	31	20
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	17	12	10	27	27	17	10	10	31	21
CGA 184927 & safener <sup>6</sup> + surf <sup>7</sup>	0.05 + 0.8%	10	10	10	27	28	10	7	10	30	20
CGA 184927 & safener + surf	0.1 + 0.8%	10	7	8	28	32	10	12	8	31	21
Check		0	0	0	28	29	0	0	0	30	22
<u>Postemergence (June 2)</u>											
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.09 & 0.37 + 0.009 & 0.005	--	10	10	26	27	--	13	17	30	18
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	--	13	10	27	26	--	12	10	30	21
Difenzoquat	0.75	--	15	15	28	29	--	92	90	26	4
Difenzoquat	1.0	--	22	23	24	32	--	90	90	25	2
Difenzoquat	1.5	--	33	23	25	26	--	90	90	26	2
Imazamethabenz <sup>8</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	--	13	10	26	28	--	85	83	27	5
Fenoxaprop & 2,4-D & MCPA <sup>9</sup>	0.0921 & 0.121 & 0.366	--	10	15	28	28	--	12	15	31	23
Fenoxaprop & 2,4-D & MCPA	0.138 & 0.182 & 0.549	--	12	13	26	29	--	10	13	30	23
Check		--	0	0	27	28	--	0	0	29	23
<u>LSD (P=.05)</u>		5	7	9	2	ns	5	5	6	2	4

1 Puma 1E.

2 COC = Class Crop Oil Concentrate.

3 NIS = Class Preference nonionic surfactant.

4 Premix = Cheyenne 2.69E.

5 Premix = Harmony Extra 75DF.

6 Discover 2E.

7 surf = Score.

8 Assert LC 2.5E.

9 Premix = Tiller 2.77E.

Table 3. Hard red spring wheat tolerance to postemergence herbicides at Rosemount, MN -1999 (Durgan and Miller).

Treatment	Rate (lb/A)	AC Barrie					Forge				
		Injury			Height inch	Yield Bu/A	Injury			Height inch	Yield Bu/A
		6/1	6/23	7/10			6/1	6/23	7/10		
		-----	%	-----			-----	%	-----		
<u>Postemergence (May 22)</u>											
Fenoxaprop & safener <sup>1</sup>	0.104	5	7	8	32	18	5	7	8	31	26
Fenoxaprop & safener	0.208	12	7	8	33	19	12	7	8	30	30
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	10	8	8	33	19	10	13	12	31	31
Tralkoxydim + COC	0.36 + 0.5%	22	12	10	33	18	25	12	12	30	28
MKH 6562 + NIS <sup>3</sup>	0.027 + 0.25%	17	13	13	32	16	17	13	12	30	29
MKH 6562 + NIS	0.054 + 0.25%	22	17	15	32	16	22	18	20	30	28
Fenoxaprop & MCPA <sup>4</sup> + thifensulfuron & tribenuron <sup>5</sup>	0.09 & 0.37 + 0.009 & 0.005	12	10	17	32	15	12	7	10	30	29
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	18	17	10	32	15	18	12	10	31	26
CGA 184927 & safener <sup>6</sup> + surf <sup>7</sup>	0.05 + 0.8%	10	17	17	33	18	10	7	10	29	29
CGA 184927 & safener + surf	0.1 + 0.8%	10	13	8	34	18	10	3	8	31	33
Check		0	0	0	33	19	0	0	0	30	34
<u>Postemergence (June 2)</u>											
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.09 & 0.37 + 0.009 & 0.005	--	13	10	33	17	--	8	10	31	30
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	--	13	10	32	18	--	10	10	30	28
Difenzoquat	0.75	--	15	15	33	18	--	20	15	29	26
Difenzoquat	1.0	--	18	23	31	17	--	25	23	27	27
Difenzoquat	1.5	--	35	23	30	14	--	38	33	27	22
Imazamethabenz <sup>8</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	--	12	10	30	20	--	20	10	28	31
Fenoxaprop & 2,4-D & MCPA <sup>9</sup>	0.0921 & 0.121 & 0.366	--	13	15	31	16	--	15	15	30	29
Fenoxaprop & 2,4-D & MCPA	0.138 & 0.182 & 0.549	--	13	13	33	19	--	15	13	28	31
Check		--	0	0	32	20	--	0	0	30	33
LSD (P=.05)		5	7	10	ns	3	6	9	8	2	6

Table 4. Hard red spring wheat tolerance to postemergence herbicides at Rosemount, MN -1999 (Durgan and Miller).

Treatment	Rate (lb/A)	Ingot					McVey				
		Injury			Height inch	Yield Bu/A	Injury			Height inch	Yield Bu/A
		6/1	6/23	7/10			6/1	6/23	7/10		
		-----	%	-----			-----	%	-----		
<u>Postemergence (May 22)</u>											
Fenoxaprop & safener <sup>1</sup>	0.104	5	7	7	33	34	5	7	8	29	25
Fenoxaprop & safener	0.208	12	8	8	33	33	12	7	8	29	27
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	10	7	10	32	31	10	7	8	28	28
Tralkoxydim + COC	0.36 + 0.5%	22	8	8	32	31	25	10	8	29	26
MKH 6562 + NIS <sup>3</sup>	0.027 + 0.25%	17	10	10	33	28	17	13	10	28	25
MKH 6562 + NIS	0.054 + 0.25%	22	15	17	31	31	22	17	17	28	23
Fenoxaprop & MCPA <sup>4</sup> + thifensulfuron & tribenuron <sup>5</sup>	0.09 & 0.37 + 0.009 & 0.005	12	15	10	31	32	12	10	10	28	25
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	17	12	10	31	32	18	15	10	29	24
CGA 184927 & safener <sup>6</sup> + surf <sup>7</sup>	0.05 + 0.8%	10	10	10	33	32	10	10	10	28	26
CGA 184927 & safener + surf	0.1 + 0.8%	10	7	8	32	32	10	10	8	28	26
Check		0	0	0	33	33	0	0	0	29	30
<u>Postemergence (June 2)</u>											
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.09 & 0.37 + 0.009 & 0.005	--	10	10	33	32	--	13	10	28	22
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	--	10	10	33	32	--	12	10	28	24
Difenzoquat	0.75	--	23	20	32	29	--	17	15	27	24
Difenzoquat	1.0	--	28	23	30	25	--	23	20	27	21
Difenzoquat	1.5	--	38	27	28	20	--	35	23	26	17
Imazamethabenz <sup>8</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	--	12	10	32	33	--	12	10	28	28
Fenoxaprop & 2,4-D & MCPA <sup>9</sup>	0.0921 & 0.121 & 0.366	--	15	15	32	32	--	17	15	29	23
Fenoxaprop & 2,4-D & MCPA	0.138 & 0.182 & 0.549	--	22	13	31	34	--	15	13	28	28
Check		--	0	0	33	36	--	0	0	28	29
LSD (P=.05)		5	8	9	2	4	6	8	9	ns	5

1 Puma 1E.  
2 COC = Class Crop Oil Concentrate.  
3 NIS = Class Preference nonionic surfactant.  
4 Premix = Cheyenne 2.69E.  
5 Premix = Harmony Extra 75DF.  
6 Discover 2E.  
7 surf = Score.  
8 Assert LC 2.5E.  
9 Premix = Tiller 2.77E.

Table 5. Hard red spring wheat tolerance to postemergence herbicides at Rosemount, MN -1999 (Durgan and Miller).

Treatment	Rate (lb/A)	Sharpshooter					Ivan				
		Injury			Height inch	Yield Bu/A	Injury			Height inch	Yield Bu/A
		6/1	6/23	7/10			6/1	6/23	7/10		
		-----	%	-----			-----	%	-----		
<u>Postemergence (May 22)</u>											
Fenoxaprop & safener <sup>1</sup>	0.104	5	10	10	31	23	5	10	10	31	32
Fenoxaprop & safener	0.208	12	7	8	31	26	12	7	8	31	32
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	10	8	10	30	22	10	12	10	30	33
Tralkoxydim + COC	0.36 + 0.5%	25	10	10	32	26	22	13	10	31	29
MKH 6562 + NIS <sup>3</sup>	0.027 + 0.25%	23	10	12	30	24	17	10	12	30	31
MKH 6562 + NIS	0.054 + 0.25%	22	12	13	31	24	22	13	17	29	30
Fenoxaprop & MCPA <sup>4</sup> + thifensulfuron & tribenuron <sup>5</sup>	0.09 & 0.37 + 0.009 & 0.005	12	10	10	30	25	12	12	10	30	28
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	17	12	10	31	22	17	12	10	30	28
CGA 184927 & safener <sup>6</sup> + surf <sup>7</sup>	0.05 + 0.8%	10	12	10	31	28	10	12	10	29	29
CGA 184927 & safener + surf	0.1 + 0.8%	10	8	8	31	24	10	7	8	31	34
Check		0	0	0	30	26	0	0	0	30	33
<u>Postemergence (June 2)</u>											
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.09 & 0.37 + 0.009 & 0.005	--	8	10	29	22	--	10	10	30	32
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	--	13	10	30	22	--	10	10	29	28
Difenzoquat	0.75	--	12	12	31	22	--	18	15	30	27
Difenzoquat	1.0	--	22	27	29	23	--	38	57	27	23
Difenzoquat	1.5	--	32	17	27	21	--	60	50	25	17
Imazamethabenz <sup>8</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	--	13	10	29	26	--	20	10	29	30
Fenoxaprop & 2,4-D & MCPA <sup>9</sup>	0.0921 & 0.121 & 0.366	--	18	15	30	20	--	22	15	29	29
Fenoxaprop & 2,4-D & MCPA	0.138 & 0.182 & 0.549	--	20	13	29	21	--	15	13	29	32
Check		--	0	0	29	25	--	0	0	30	33
<u>LSD (P=.05)</u>		7	7	7	ns	3	5	12	14	2	4

Table 6. Hard red spring wheat tolerance to postemergence herbicides at Rosemount, MN -1999 (Durgan and Miller).

Treatment	Rate (lb/A)	Verde				
		Injury			Height inch	Yield Bu/A
		6/1	6/23	7/10		
		-----	%	-----		
<u>Postemergence (May 22)</u>						
Fenoxaprop & safener <sup>1</sup>	0.104	5	3	8	30	35
Fenoxaprop & safener	0.208	12	7	8	30	33
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	10	7	8	29	34
Tralkoxydim + COC	0.36 + 0.5%	25	7	10	31	32
MKH 6562 + NIS <sup>3</sup>	0.027 + 0.25%	17	12	12	30	32
MKH 6562 + NIS	0.054 + 0.25%	22	13	17	30	32
Fenoxaprop & MCPA <sup>4</sup> + thifensulfuron & tribenuron <sup>5</sup>	0.09 & 0.37 + 0.009 & 0.005	12	7	10	30	32
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	17	12	10	30	30
CGA 184927 & safener <sup>6</sup> + surf <sup>7</sup>	0.05 + 0.8%	10	3	10	29	35
CGA 184927 & safener + surf	0.1 + 0.8%	10	3	8	31	32
Check		0	0	0	30	36
<u>Postemergence (June 2)</u>						
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.09 & 0.37 + 0.009 & 0.005	--	8	10	29	28
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	--	12	37	29	27
Difenzoquat	0.75	--	88	63	25	6
Difenzoquat	1.0	--	90	90	22	6
Difenzoquat	1.5	--	90	88	22	3
Imazamethabenz <sup>8</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	--	82	87	28	11
Fenoxaprop & 2,4-D & MCPA <sup>9</sup>	0.0921 & 0.121 & 0.366	--	13	15	29	34
Fenoxaprop & 2,4-D & MCPA	0.138 & 0.182 & 0.549	--	17	20	29	34
Check		--	0	0	29	34
<u>LSD (P=.05)</u>		5	8	23	2	4

1 Puma 1E.

2 COC = Class Crop Oil Concentrate.

3 NIS = Class Preference nonionic surfactant.

4 Premix = Cheyenne 2.69E.

5 Premix = Harmony Extra 75DF.

6 Discover 2E.

7 surf = Score.

8 Assert LC 2.5E.

9 Premix = Tiller 2.77E.

Table 7. Barley tolerance to postemergence herbicides at Rosemount, MN -1999 (Durgan and Miller).

Treatment	Rate (lb/A)	MN Brite					Stander				
		Injury			Height inch	Yield Bu/A	Injury			Height inch	Yield Bu/A
		6/1	6/23	7/10			6/1	6/23	7/10		
		-----	%	-----			-----	%	-----		
<u>Postemergence (May 22)</u>											
Fenoxaprop & safener <sup>1</sup>	0.104	5	10	10	31	41	5	12	10	27	32
Fenoxaprop & safener	0.208	12	3	15	30	41	12	7	15	27	40
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	10	20	13	32	37	10	15	12	26	35
Tralkoxydim + COC	0.36 + 0.5%	27	18	12	31	36	23	13	15	25	35
MKH 6562 + NIS <sup>3</sup>	0.027 + 0.25%	32	32	23	29	32	32	30	23	25	24
MKH 6562 + NIS	0.054 + 0.25%	30	33	25	28	34	30	37	32	25	25
Fenoxaprop & MCPA <sup>4</sup> + thifensulfuron & tribenuron <sup>5</sup>	0.09 & 0.37 + 0.009 & 0.005	15	23	23	31	40	12	38	33	26	28
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	23	33	40	29	36	22	38	43	24	26
CGA 184927 & safener <sup>6</sup> + surf <sup>7</sup>	0.05 + 0.8%	10	35	37	30	31	10	52	53	26	20
CGA 184927 & safener + surf	0.1 + 0.8%	10	65	67	31	33	10	68	73	25	12
Check		0	0	0	32	42	0	0	0	27	42
<u>Postemergence (June 2)</u>											
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.09 & 0.37 + 0.009 & 0.005	--	33	27	30	32	--	28	23	25	30
Fenoxaprop & MCPA + thifensulfuron & tribenuron	0.14 & 0.55 + 0.014 & 0.007	--	33	32	30	36	--	30	35	25	35
Difenzoquat	0.75	--	10	13	29	39	--	10	13	24	39
Difenzoquat	1.0	--	23	23	29	37	--	23	23	25	31
Difenzoquat	1.5	--	28	18	30	38	--	33	23	24	33
Imazamethabenz <sup>8</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	--	12	10	30	39	--	13	10	26	37
Fenoxaprop & 2,4-D & MCPA <sup>9</sup>	0.0921 & 0.121 & 0.366	--	18	15	30	40	--	15	15	26	35
Fenoxaprop & 2,4-D & MCPA	0.138 & 0.182 & 0.549	--	17	13	31	36	--	17	13	26	33
Check		--	0	0	31	36	--	0	0	26	40
LSD (P=.05)		9	12	19	2	ns	9	17	22	ns	5

1 Puma 1E.

2 COC = Class Crop Oil Concentrate.

3 NIS = Class Preference nonionic surfactant.

4 Premix = Cheyenne 2.69E.

5 Premix = Harmony Extra 75DF.

6 Discover 2E.

7 surf = Score.

8 Assert LC 2.5E.

9 Premix = Tiller 2.77E.