

Hard red spring wheat and barley tolerance to postemergence herbicides at Rosemount, MN - 2000. 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. 'Alsen', 'Forge', 'Gunner', 'HJ98', 'Ingot', 'Ivan', 'McVey', 'Parshall', 'Reeder', 'Verde', and '2375' hard red spring wheat varieties, plus 'Lacey' and 'Robust' barley varieties were seeded on April 25 at 85 lb/A and 90 lbs/A for wheat and barley, respectively. Propachlor at 2.5 lbs ai/A was applied preemergence on April 26 to control grassy weeds. Bromoxynil at 0.25 lba ai/A was applied postemergence on May 25 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 varieties. Each herbicide x variety plot was 10 feet wide by 17 feet long. Herbicide treatments were applied May 19 and May 31. Environmental conditions at application are listed below. Crop injury was rated visually 7 and 21 days after each application. Crop height was measured at maturity and yields taken. Data were summarized by variety and are presented in Tables 1 to 7.

Treatment Date	May 19	May 31
Target crop stage	3-4 leaf	4-5 leaf
Temperature (°F)		
air	59	64
soil	64	57
Relative Humidity (%)	--	70
Soil Moisture	moist	moist
Wind (mph)	2-4 SW	5-9 NE
Sky	--	90% clouds
Rainfall before application		
Week 1 (inch)	1.75	1.44
Rainfall after application		
Week 1 (inch)	0.11	2.21
Week 2 (inch)	2.12	0.63

#### Barley

Lacey		
leaf no.	3.3-2.5	5.5-6
height (inch)	4-6	11-14
tillers	2-3	2
Robust		
leaf no.	3.75	5.75-6.25
height (inch)	5-9	10-14
tillers	2	3

#### Wheat

Alsen		
leaf no.	3-3.25	6-6.25
height (inch)	4-7	7-10
tillers	1-3	3-4
Forge		
leaf no.	3.5-3.75	6
height (inch)	5-7	9-12
tillers	3	2-3
Gunner		
leaf no.	3	5.5-5.75
height (inch)	4-6	8-11
tillers	2	3

Treatment Date	May 19	May 31
Target crop stage	3-4 leaf	4-5 leaf
<u>Wheat (cont.)</u>		
HJ98		
leaf no.	3.25-3.5	5.5-6.25
height (inch)	4-6	2-3
tillers	3	9-11
Ingot		
leaf no.	3.75	5-6
height (inch)	5-8	10-12
tillers	2	2-3
Ivan		
leaf no.	3.75	5.5-5.75
height (inch)	4-6	8-11
tillers	2-3	3
McVey		
leaf no.	3	5.5-5.75
height (inch)	4-6	10-12
tillers	1-3	3-4
Parshall		
leaf no.	3	5.5-6.25
height (inch)	4-6	9-11
tillers	1-3	3
Reeder		
leaf no.	3	5-5.5
height (inch)	4-6	9-11
tillers	-	3
Verde		
leaf no.	3-3.25	5-5.25
height (inch)	4-7	8-10
tillers	2	3
2375		
leaf no.	3-3.5	5.5-5.75
height (inch)	4-7	10-13
tillers	3	2-3

Fenoxaprop & safener, tralkoxydim, and GCA 184927 & safener caused little or no injury to wheat. Tralkoxydim resulted in significantly lower yields of Forge and Gunner at both rates compared to the checks. HJ98, Ingot, and Ivan also tended to have lower yield in the tralkoxydim plots, but the differences were not always significant. MKH 6562 caused moderate injury at the 7 DAT rating to all varieties. Slight injury symptoms were still observed at the 21 DAT rating. MKH 6562 caused yield reductions in all varieties of wheat. Difenzoquat caused severe injury, height reduction, and yield reduction to the wheat varieties Alsen, Gunner, Reeder, and Verde. Moderate injury was observed on the variety Parshall which also had reduced height and moderately reduced yield. Slight injury symptoms were observed on Forge, HJ98, Ingot, Ivan, McVey, and 2375. No height reduction occurred on these varieties. Yields of Forge and HJ98 (1.5 lb/A difenzoquat) and Ivan and 2375 (1.0 lb/A and 1.5 lb/A difenzoquat) were reduced.

Fenoxaprop & safener, tralkoxydim, MKH 6562 and CGA 184927 & safener caused moderate barley injury at the 7 DAT rating. Moderate injury symptoms were still visible in MKH 6562 and CGA 184927 & safener treatments at the 21 DAT. Tralkoxydim, MKH 6562 and CGA 184927 & safener all significantly reduced barley yields compared to the checks. Difenzoquat caused only slight barley injury. No barley yield reduction occurred in the difenzoquat treatments. (Department of Agronomy and Plant Genetics, University of Minnesota, St. Paul).

Table 1. Hard red spring wheat tolerance to postemergence herbicides at Rosemount, MN -2000 (Durgan and Miller).

Treatment	Rate (lb/A)	Alsen				Forge			
		Injury		Height (inch)	Yield (Bu/A)	Injury		Height (inch)	Yield (Bu/A)
		7 DAT	21 DAT			7 DAT	21 DAT		
<u>Postemergence (May 19)</u>									
Fenoxaprop & safener <sup>1</sup>	0.104	0	0	35	42	0	0	37	39
Fenoxaprop & safener	0.208	0	0	35	37	0	3	36	40
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	0	0	35	39	0	5	34	30
Tralkoxydim + COC	0.36 + 0.5%	0	0	35	39	7	3	36	28
MKH 6562 <sup>3</sup> + 2,4-D ester + NIS <sup>4</sup>	0.027 + 0.5 + 0.25%	30	5	33	35	27	8	36	35
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	30	7	33	33	27	13	35	31
CGA 184927 & safener <sup>5</sup> + adjuvant <sup>6</sup>	0.05 + 0.8%	0	0	34	40	0	0	36	37
CGA 184927 & safener + adjuvant	0.1 + 0.8%	7	2	34	41	3	0	36	35
<u>Postemergence (May 31)</u>									
Difenzoquat	1.0	8	80	23	18	3	8	36	31
Difenzoquat	1.5	13	80	23	14	13	12	34	28
Imazamethabenz <sup>7</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	2	13	32	34	8	7	34	33
Check		0	0	35	41	0	0	36	39
Check		0	0	35	40	0	0	36	36
Check		0	0	35	44	0	0	36	39
Check		0	0	36	44	0	0	36	41
LSD (P=.05)		5	4	2	5	7	5	ns	7

LSD (P=.05)

<sup>1</sup> Puma 1E.

<sup>2</sup> COC = Supercharge.

<sup>3</sup> Everest 70DF.

<sup>4</sup> NIS = Class Preference nonionic surfactant.

<sup>5</sup> Discover 2E.

<sup>6</sup> adjuvant = DSV adjuvant.

<sup>7</sup> Assert LC 2.5E

Table 2. Hard red spring wheat tolerance to postemergence herbicides at Rosemount, MN - 2000 (Durgan and Miller).

Treatment	Rate (lb/A)	Gunner				HJ98			
		Injury		Height (inch)	Yield (Bu/A)	Injury		Height (inch)	Yield (Bu/A)
		7 DAT	21 DAT			7 DAT	21 DAT		
<u>Postemergence (May 19)</u>									
Fenoxaprop & safener <sup>1</sup>	0.104	0	2	37	24	3	0	34	35
Fenoxaprop & safener	0.208	0	0	36	24	7	0	34	36
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	13	3	37	19	3	0	33	31
Tralkoxydim + COC	0.36 + 0.5%	7	8	36	20	0	2	33	31
MKH 6562 <sup>3</sup> + 2,4-D ester + NIS <sup>4</sup>	0.027 + 0.5 + 0.25%	23	8	35	13	30	13	32	23
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	23	13	34	15	30	12	32	22
CGA 184927 & safener <sup>5</sup> + adjuvant <sup>6</sup>	0.05 + 0.8%	0	0	39	25	0	0	32	33
CGA 184927 & safener + adjuvant	0.1 + 0.8%	0	0	39	22	7	0	34	32
<u>Postemergence (May 31)</u>									
Difenzoquat	1.0	10	82	26	3	3	8	32	33
Difenzoquat	1.5	22	80	21	2	12	8	31	26
Imazamethabenz <sup>7</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	5	35	33	12	7	2	32	33
Check		0	0	39	26	0	0	33	38
Check		0	0	38	26	0	0	34	34
Check		0	0	39	25	0	0	34	37
Check		0	0	39	26	0	0	35	35
LSD (P=.05)		8	10	6	4	6	4	2	4

LSD (P=.05)

<sup>1</sup> Puma 1E.

<sup>2</sup> COC = Supercharge.

<sup>3</sup> Everest 70DF.

<sup>4</sup> NIS = Class Preference nonionic surfactant.

<sup>5</sup> Discover 2E.

<sup>6</sup> adjuvant = DSV adjuvant.

<sup>7</sup> Assert LC 2.5E

Table 3. Hard red spring wheat tolerance to postemergence herbicides at Rosemount, MN - 2000 (Durgan and Miller).

Treatment	Rate (lb/A)	Ingot				Ivan			
		Injury		Height (inch)	Yield (Bu/A)	Injury		Height (inch)	Yield (Bu/A)
		7 DAT	21 DAT			7 DAT	21 DAT		
<u>Postemergence (May 19)</u>									
Fenoxaprop & safener <sup>1</sup>	0.104	0	0	38	37	0	0	32	44
Fenoxaprop & safener	0.208	0	0	39	34	0	0	33	45
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	0	3	38	34	0	0	33	42
Tralkoxydim + COC	0.36 + 0.5%	0	3	40	32	0	3	32	41
MKH 6562 <sup>3</sup> + 2,4-D ester + NIS <sup>4</sup>	0.027 + 0.5 + 0.25%	23	8	38	31	27	5	31	37
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	23	12	37	30	27	7	31	36
CGA 184927 & safener <sup>5</sup> + adjuvant <sup>6</sup>	0.05 + 0.8%	0	0	40	36	0	0	32	44
CGA 184927 & safener + adjuvant	0.1 + 0.8%	0	0	38	36	0	0	31	42
<u>Postemergence (May 31)</u>									
Difenzoquat	1.0	5	10	35	36	3	8	32	38
Difenzoquat	1.5	13	15	35	32	12	7	21	38
Imazamethabenz <sup>7</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	3	10	37	38	3	0	33	46
Check		0	0	40	37	0	0	31	45
Check		0	0	39	40	0	0	33	47
Check		0	0	38	43	0	0	32	45
Check		0	0	39	41	0	0	33	48
LSD (P=.05)		5	5	ns	6	4	5	ns	4

LSD (P=.05)

<sup>1</sup> Puma 1E.<sup>2</sup> COC = Supercharge.<sup>3</sup> Everest 70DF.<sup>4</sup> NIS = Class Preference nonionic surfactant.<sup>5</sup> Discover 2E.<sup>6</sup> adjuvant = DSV adjuvant.<sup>7</sup> Assert LC 2.5E

Table 4. Hard red spring wheat tolerance to postemergence herbicides at Rosemount, MN - 2000 (Durgan and Miller).

Treatment	Rate (lb/A)	McVey				Parshall			
		Injury		Height (inch)	Yield (Bu/A)	Injury		Height (inch)	Yield (Bu/A)
		7 DAT	21 DAT			7 DAT	21 DAT		
<u>Postemergence (May 19)</u>									
Fenoxaprop & safener <sup>1</sup>	0.104	0	0	36	14	0	0	41	38
Fenoxaprop & safener	0.208	7	0	35	17	0	0	39	36
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	0	0	36	15	0	0	41	37
Tralkoxydim + COC	0.36 + 0.5%	0	3	35	13	0	2	40	35
MKH 6562 <sup>3</sup> + 2,4-D ester + NIS <sup>4</sup>	0.027 + 0.5 + 0.25%	30	15	35	8	30	7	39	33
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	30	13	33	9	30	8	39	33
CGA 184927 & safener <sup>5</sup> + adjuvant <sup>6</sup>	0.05 + 0.8%	0	0	36	13	0	0	37	38
CGA 184927 & safener + adjuvant	0.1 + 0.8%	3	2	35	11	7	0	42	33
<u>Postemergence (May 31)</u>									
Difenzoquat	1.0	8	8	36	15	8	28	36	23
Difenzoquat	1.5	10	8	33	14	13	47	31	17
Imazamethabenz <sup>7</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	7	3	35	15	7	15	38	28
Check		0	0	34	16	0	0	41	39
Check		0	0	35	16	0	0	42	37
Check		0	0	36	19	0	0	41	40
Check		0	0	35	17	0	0	42	40
LSD (P=.05)		7	6	ns	6	6	11	4	6

LSD (P=.05)

<sup>1</sup> Puma 1E.<sup>2</sup> COC = Supercharge.<sup>3</sup> Everest 70DF.<sup>4</sup> NIS = Class Preference nonionic surfactant.<sup>5</sup> Discover 2E.<sup>6</sup> adjuvant = DSV adjuvant.<sup>7</sup> Assert LC 2.5E

Table 5. Hard red spring wheat tolerance to postemergence herbicides at Rosemount, MN - 2000 (Durgan and Miller).

Treatment	Rate (lb/A)	Reeder				Verde			
		Injury		Height (inch)	Yield (Bu/A)	Injury		Height (inch)	Yield (Bu/A)
		7 DAT	21 DAT			7 DAT	21 DAT		
<u>Postemergence (May 19)</u>									
Fenoxaprop & safener <sup>1</sup>	0.104	0	0	36	39	0	0	34	39
Fenoxaprop & safener	0.208	0	0	36	38	0	0	34	34
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	0	0	35	38	0	0	33	39
Tralkoxydim + COC	0.36 + 0.5%	0	2	35	38	0	0	33	34
MKH 6562 <sup>3</sup> + 2,4-D ester + NIS <sup>4</sup>	0.027 + 0.5 + 0.25%	30	8	35	36	27	7	32	26
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	30	8	33	35	27	7	32	25
CGA 184927 & safener <sup>5</sup> + adjuvant <sup>6</sup>	0.05 + 0.8%	0	0	36	40	0	0	33	37
CGA 184927 & safener + adjuvant	0.1 + 0.8%	7	0	32	41	0	0	34	34
<u>Postemergence (May 31)</u>									
Difenzoquat	1.0	8	82	20	4	8	82	22	11
Difenzoquat	1.5	13	80	18	3	13	80	21	7
Imazamethabenz <sup>7</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	5	28	29	17	5	33	27	22
Check		0	0	35	42	0	0	32	41
Check		0	0	34	42	0	0	34	40
Check		0	0	37	43	0	0	34	42
Check		0	0	36	42	0	0	34	42
<u>LSD (P=.05)</u>		7	9	3	5	6	10	3	6

<sup>1</sup> Puma 1E.

<sup>2</sup> COC = Supercharge.

<sup>3</sup> Everest 70DF.

<sup>4</sup> NIS = Class Preference nonionic surfactant.

<sup>5</sup> Discover 2E.

<sup>6</sup> adjuvant = DSV adjuvant.

<sup>7</sup> Assert LC 2.5E

Table 6. Hard red spring wheat tolerance to postemergence herbicides at Rosemount, MN - 2000 (Durgan and Miller).

Treatment	Rate (lb/A)	2375			
		Injury		Height (inch)	Yield (Bu/A)
		7 DAT	21 DAT		
<u>Postemergence (May 19)</u>					
Fenoxaprop & safener <sup>1</sup>	0.104	0	0	36	24
Fenoxaprop & safener	0.208	0	0	36	25
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	0	3	35	22
Tralkoxydim + COC	0.36 + 0.5%	0	0	35	21
MKH 6562 <sup>3</sup> + 2,4-D ester + NIS <sup>4</sup>	0.027 + 0.5 + 0.25%	27	13	33	16
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	30	15	33	15
CGA 184927 & safener <sup>5</sup> + adjuvant <sup>6</sup>	0.05 + 0.8%	0	0	35	22
CGA 184927 & safener + adjuvant	0.1 + 0.8%	0	0	33	22
<u>Postemergence (May 31)</u>					
Difenzoquat	1.0	0	7	33	15
Difenzoquat	1.5	12	13	33	17
Imazamethabenz <sup>7</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	3	2	34	22
Check		0	0	36	21
Check		0	0	35	26
Check		0	0	32	29
Check		0	0	36	27
<u>LSD (P=.05)</u>		3	4	ns	5

<sup>1</sup> Puma 1E.

<sup>2</sup> COC = Supercharge.

<sup>3</sup> Everest 70DF.

<sup>4</sup> NIS = Class Preference nonionic surfactant.

<sup>5</sup> Discover 2E.

<sup>6</sup> adjuvant = DSV adjuvant.

<sup>7</sup> Assert LC 2.5E

Table 7. Barley tolerance to postemergence herbicides at Rosemount, MN - 2000 (Durgan and Miller).

Treatment	Rate (lb/A)	Lacey				Robust			
		Injury		Height (inch)	Yield (Bu/A)	Injury		Height (inch)	Yield (Bu/A)
		7 DAT ----- (%) -----	21 DAT ----- (%) -----			7 DAT ----- (%) -----	21 DAT ----- (%) -----		
<u>Postemergence (May 19)</u>									
Fenoxaprop & safener <sup>1</sup>	0.104	20	7	33	52	20	5	37	42
Fenoxaprop & safener	0.208	10	2	35	53	20	2	35	46
Tralkoxydim + COC <sup>2</sup>	0.18 + 0.5%	13	7	34	43	20	8	34	36
Tralkoxydim + COC	0.36 + 0.5%	20	15	33	39	27	18	34	33
MKH 6562 <sup>3</sup> + 2,4-D ester + NIS <sup>4</sup>	0.027 + 0.5 + 0.25%	33	23	32	35	37	37	34	20
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	33	22	34	23	37	37	32	5
CGA 184927 & safener <sup>5</sup> + adjuvant <sup>6</sup>	0.05 + 0.8%	23	13	36	24	23	20	36	26
CGA 184927 & safener + adjuvant	0.1 + 0.8%	27	35	35	33	30	37	38	21
<u>Postemergence (May 31)</u>									
Difenzoquat	1.0	7	2	33	52	3	2	32	49
Difenzoquat	1.5	8	3	33	49	10	3	35	44
Imazamethabenz <sup>7</sup> + difenzoquat + NIS	0.23 + 0.5 + 0.25%	3	0	35	54	3	0	36	49
Check		0	0	35	52	0	0	36	47
Check		0	0	34	53	0	0	35	47
Check		0	0	35	56	0	0	34	50
Check		0	0	35	57	0	0	38	50
LSD (P=.05)		9	11	ns	8	8	11	ns	8

<sup>1</sup> Puma 1E.

<sup>2</sup> COC = Supercharge.

<sup>3</sup> Everest 70DF.

<sup>4</sup> NIS = Class Preference nonionic surfactant.

<sup>5</sup> Discover 2E.

<sup>6</sup> adjuvant = DSV adjuvant.

<sup>7</sup> Assert LC 2.5E