

Hard red spring wheat and barley tolerance to postemergence herbicides at Crookston, MN - 2000.

Durgan, Beverly R. James Cameron and Douglas W. Miller. This experiment was designed to evaluate wheat and barley tolerance to various postemergence herbicides. The experiment was conducted at Crookston, MN on a Donaldson and Wheaton loam soil. Following weedy fallow, the experimental area received 100 lb/A of N and was fall plowed. In the spring the experimental area was disked 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 29 at 1.75 Bu/A and 2 Bu/A for wheat and barley, respectively. All herbicide treatments were applied with a backpack type sprayer delivering 10 gpa at 30 psi using 80015 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 8 by 8 ft. Herbicide treatments were applied May 25 and May 31. Environmental conditions are listed below. Crop injury was rated visually 8 days after each application and again on June 27. Crop height was measured at maturity and yields were taken. Data were summarized by variety and are presented in Tables 1 to 7.

Treatment Date	May 25	May 31
Target crop stage	3-4 leaf	4-5 leaf
Rainfall before Application		
Week 1 (inch)	0.21	0.39
Rainfall after Application		
Week 1 (inch)	0.43	0.05
Week 2 (inch)	0.03	2.64

Fenoxaprop & safener, tralkoxydim, and GCA 184927 & safener caused little or no injury to wheat. MKH 6562 caused moderate injury at the 8 DAT rating and slight injury symptoms were observed at the June 27 rating. No height or yield reductions were observed in wheat with these treatments. Difenzoquat caused severe injury and yield loss in the wheat varieties Alsen, Gunner, Reeder and Verde. High injury symptoms and slight yield loss were observed in the varieties Ingot, Ivan and Parshall. Moderate injury symptoms but no yield loss occurred in the varieties Forge, HJ98, Mc Vey, and 2375.

Fenoxaprop & safener and tralkoxydim caused slight injury in barley. MKH 6562 and CGA 184927 & safener caused moderate injury symptoms. MKH 6562 injury was greater on Robust compared to Lacey and resulted in significantly reduced Robust barley yield. 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 Crookston, MN -2000 (Durgan, Cameron, and Miller).

Treatment	Rate (lb/A)	Alsen				Forge			
		Injury		Height (inch)	Yield (Bu/A)	Injury		Height (inch)	Yield (Bu/A)
		8 DAT ----- (%) -----	6/27 -----			8 DAT ----- (%) -----	6/27 -----		
Postemergence (May 25)									
Fenoxaprop & safener ¹	0.104	5	3	33	44	0	5	37	46
Fenoxaprop & safener	0.208	3	0	36	39	3	7	37	40
Tralkoxydim + COC ²	0.18 + 0.5%	2	3	37	41	2	2	36	46
Tralkoxydim + COC	0.36 + 0.5%	2	8	36	43	3	7	34	45
MKH 6562 ³ + 2,4-D ester + NIS ⁴	0.027 + 0.5 + 0.25%	23	10	35	43	23	13	34	44
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	18	15	35	43	20	17	33	46
CGA 184927 & safener ⁵ + adjuvant ⁶	0.05 + 0.8%	0	3	35	37	0	7	36	43
CGA 184927 & safener + adjuvant	0.1 + 0.8%	2	3	37	39	2	2	35	49
Postemergence (May 31)									
Difenzoquat	1.0	20	90	30	20	8	13	35	42
Difenzoquat	1.5	18	90	30	19	13	25	33	37
Imazamethabenz ⁷ + difenzoquat + NIS	0.23 + 0.5 + 0.25%	10	40	31	36	2	12	33	46
Check		0	0	36	40	0	0	34	40
LSD (P=.05)		8	13	4	8	7	10	3	ns

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

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

Treatment	Rate (lb/A)	Gunner				HJ98			
		Injury		Height (inch)	Yield (Bu/A)	Injury		Height (inch)	Yield (Bu/A)
		8 DAT ----- (%) -----	6/27 -----			8 DAT ----- (%) -----	6/27 -----		
Postemergence (May 25)									
Fenoxaprop & safener ¹	0.104	0	2	35	42	7	3	35	44
Fenoxaprop & safener	0.208	3	3	38	44	12	8	35	38
Tralkoxydim + COC ²	0.18 + 0.5%	2	5	32	37	2	3	36	45
Tralkoxydim + COC	0.36 + 0.5%	3	5	36	44	0	0	36	52
MKH 6562 ³ + 2,4-D ester + NIS ⁴	0.027 + 0.5 + 0.25%	23	8	35	37	23	13	34	46
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	18	10	35	43	20	17	33	54
CGA 184927 & safener ⁵ + adjuvant ⁶	0.05 + 0.8%	2	2	36	38	2	2	35	48
CGA 184927 & safener + adjuvant	0.1 + 0.8%	2	5	36	42	3	5	35	47
Postemergence (May 31)									
Difenzoquat	1.0	15	92	31	19	12	12	34	44
Difenzoquat	1.5	17	92	31	13	16	30	33	34
Imazamethabenz ⁷ + difenzoquat + NIS	0.23 + 0.5 + 0.25%	12	60	32	25	3	10	33	46
Check		0	0	34	39	0	0	35	46
LSD (P=.05)		8	6	4	9	8	8	1	ns

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

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

Treatment	Rate (lb/A)	Ingot				Ivan			
		Injury		Height (inch)	Yield (Bu/A)	Injury		Height (inch)	Yield (Bu/A)
		8 DAT ----- (%)	6/27 -----			8 DAT ----- (%)	6/27 -----		
Postemergence (May 25)									
Fenoxaprop & safener ¹	0.104	0	2	40	50	7	8	34	39
Fenoxaprop & safener	0.208	5	5	39	40	3	7	34	40
Tralkoxydim + COC ²	0.18 + 0.5%	0	3	40	48	2	3	36	46
Tralkoxydim + COC	0.36 + 0.5%	3	2	40	50	0	7	36	42
MKH 6562 ³ + 2,4-D ester + NIS ⁴	0.027 + 0.5 + 0.25%	23	13	39	46	27	8	32	45
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	15	12	38	49	17	13	33	45
CGA 184927 & safener ⁵ + adjuvant ⁶	0.05 + 0.8%	2	5	41	50	3	2	35	50
CGA 184927 & safener + adjuvant	0.1 + 0.8%	2	2	38	53	3	3	35	45
Postemergence (May 31)									
Difenzoquat	1.0	5	20	38	43	7	53	31	41
Difenzoquat	1.5	10	42	37	33	10	63	31	36
Imazamethabenz ⁷ + difenzoquat + NIS	0.23 + 0.5 + 0.25%	2	8	39	52	5	12	33	43
Check		0	0	39	48	0	0	34	44
LSD (P=.05)		7	11	ns	9	9	10	ns	ns

¹ Puma 1E.

² COC = Supercharge.

³ Everest 70DF.

⁴ NIS = Class Preference nonionic surfactant.

⁵ Discover 2E.

⁶ adjuvant = DSV adjuvant.

⁷ Assert LC 2.5E

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

Treatment	Rate (lb/A)	McVey				Parshall			
		Injury		Height (inch)	Yield (Bu/A)	Injury		Height (inch)	Yield (Bu/A)
		8 DAT ----- (%)	6/27 -----			8 DAT ----- (%)	6/27 -----		
Postemergence (May 25)									
Fenoxaprop & safener ¹	0.104	5	2	35	49	3	5	40	44
Fenoxaprop & safener	0.208	7	0	38	53	10	8	39	41
Tralkoxydim + COC ²	0.18 + 0.5%	0	3	37	55	0	5	41	48
Tralkoxydim + COC	0.36 + 0.5%	3	2	36	50	3	0	42	45
MKH 6562 ³ + 2,4-D ester + NIS ⁴	0.027 + 0.5 + 0.25%	23	7	35	46	23	10	39	48
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	22	8	35	52	22	15	38	49
CGA 184927 & safener ⁵ + adjuvant ⁶	0.05 + 0.8%	2	7	37	42	0	5	41	48
CGA 184927 & safener + adjuvant	0.1 + 0.8%	0	12	37	52	0	3	40	45
Postemergence (May 31)									
Difenzoquat	1.0	7	22	34	37	10	65	36	33
Difenzoquat	1.5	12	38	33	32	13	60	35	29
Imazamethabenz ⁷ + difenzoquat + NIS	0.23 + 0.5 + 0.25%	2	10	36	45	5	13	38	44
Check		0	0	33	40	0	0	40	44
LSD (P=.05)		9	10	ns	8	11	15	2	11

¹ Puma 1E.

² COC = Supercharge.

³ Everest 70DF.

⁴ NIS = Class Preference nonionic surfactant.

⁵ Discover 2E.

⁶ adjuvant = DSV adjuvant.

⁷ Assert LC 2.5E

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

Treatment	Rate (lb/A)	Reeder				Verde			
		Injury		Height (inch)	Yield (Bu/A)	Injury		Height (inch)	Yield (Bu/A)
		8 DAT ----- (%) -----	6/27 -----			8 DAT ----- (%) -----	6/27 -----		
<u>Postemergence (May 25)</u>									
Fenoxaprop & safener ¹	0.104	2	3	37	49	3	5	35	49
Fenoxaprop & safener	0.208	2	5	37	44	7	5	36	45
Tralkoxydim + COC ²	0.18 + 0.5%	0	2	37	51	0	5	35	51
Tralkoxydim + COC	0.36 + 0.5%	3	5	38	50	2	8	35	53
MKH 6562 ³ + 2,4-D ester + NIS ⁴	0.027 + 0.5 + 0.25%	23	8	36	47	23	8	32	43
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	20	12	36	48	20	12	33	47
CGA 184927 & safener ⁵ + adjuvant ⁶	0.05 + 0.8%	0	7	38	46	0	5	34	46
CGA 184927 & safener + adjuvant	0.1 + 0.8%	0	3	38	49	0	5	34	47
<u>Postemergence (May 31)</u>									
Difenzoquat	1.0	12	90	26	21	17	92	26	24
Difenzoquat	1.5	17	95	27	16	18	92	27	17
Imazamethabenz ⁷ + difenzoquat + NIS	0.23 + 0.5 + 0.25%	7	45	34	37	5	33	31	38
Check		0	0	38	49	0	0	34	47
LSD (P=.05)		7	11	4	9	7	15	3	6

¹ Puma 1E.

² COC = Supercharge.

³ Everest 70DF.

⁴ NIS = Class Preference nonionic surfactant.

⁵ Discover 2E.

⁶ adjuvant = DSV adjuvant.

⁷ Assert LC 2.5E

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

Treatment	Rate (lb/A)	2375			
		Injury		Height (inch)	Yield (Bu/A)
		8 DAT ----- (%) -----	6/27 -----		
<u>Postemergence (May 25)</u>					
Fenoxaprop & safener ¹	0.104	5	2	34	46
Fenoxaprop & safener	0.208	3	3	34	42
Tralkoxydim + COC ²	0.18 + 0.5%	0	2	36	45
Tralkoxydim + COC	0.36 + 0.5%	2	0	34	42
MKH 6562 ³ + 2,4-D ester + NIS ⁴	0.027 + 0.5 + 0.25%	27	12	33	44
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	23	13	33	49
CGA 184927 & safener ⁵ + adjuvant ⁶	0.05 + 0.8%	2	10	35	47
CGA 184927 & safener + adjuvant	0.1 + 0.8%	2	7	35	42
<u>Postemergence (May 31)</u>					
Difenzoquat	1.0	10	23	33	37
Difenzoquat	1.5	13	50	32	25
Imazamethabenz ⁷ + difenzoquat + NIS	0.23 + 0.5 + 0.25%	3	10	35	40
Check		0	0	36	39
LSD (P=.05)		10	10	2	10

¹ Puma 1E.

² COC = Supercharge.

³ Everest 70DF.

⁴ NIS = Class Preference nonionic surfactant.

⁵ Discover 2E.

⁶ adjuvant = DSV adjuvant.

⁷ Assert LC 2.5E

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

Treatment	Rate (lb/A)	Lacey				Robust			
		Injury		Height (inch)	Yield (Bu/A)	Injury		Height (inch)	Yield (Bu/A)
		8 DAT ----- (%) -----	6/27 -----			8 DAT ----- (%) -----	6/27 -----		
<u>Postemergence (May 25)</u>									
Fenoxaprop & safener ¹	0.104	7	3	35	58	7	5	37	61
Fenoxaprop & safener	0.208	10	5	34	57	13	5	37	58
Tralkoxydim + COC ²	0.18 + 0.5%	17	5	35	56	13	2	37	57
Tralkoxydim + COC	0.36 + 0.5%	23	2	35	61	20	0	37	64
MKH 6562 ³ + 2,4-D ester + NIS ⁴	0.027 + 0.5 + 0.25%	33	17	32	50	30	32	34	41
MKH 6562 + 2,4-D ester + NIS	0.054 + 0.5 + 0.25%	27	18	32	50	30	25	33	47
CGA 184927 & safener ⁵ + adjuvant ⁶	0.05 + 0.8%	30	17	35	60	30	27	37	59
CGA 184927 & safener + adjuvant	0.1 + 0.8%	30	20	35	56	30	28	38	60
<u>Postemergence (May 31)</u>									
Difenzoquat	1.0	5	2	35	64	7	2	36	56
Difenzoquat	1.5	8	5	34	59	10	5	35	61
Imazamethabenz ⁷ + difenzoquat + NIS	0.23 + 0.5 + 0.25%	2	3	34	63	3	7	36	62
Check		0	0	35	54	0	0	37	57
LSD (P=.05)		10	12	2	ns	7	9	3	12

¹ Puma 1E.

² COC = Supercharge.

³ Everest 70DF.

⁴ NIS = Class Preference nonionic surfactant.

⁵ Discover 2E.

⁶ adjuvant = DSV adjuvant.

⁷ Assert LC 2.5E