Hard red spring wheat and barley tolerance to postemergence herbicides at Crookston, MN - 2005. Durgan, Beverly R., Jochum J. Wiersma, and James H. Cameron This experiment was designed to evaluate the tolerance of selected Hard Red Spring Wheat (HRSW) and barley varieties to several postemergence herbicides and a plant growth regulator. The experiment was conducted at Crookston, MN on a Donaldson/Wheaton loam. Following soybeans, the experimental area was chisel plowed in the fall of 2004. In the spring of 2005, 110 lbs/A N was applied and the experimental area was tilled with a field cultivator to prepare the seedbed. . The HRSW varieties 'Alsen', 'Banton', 'Briggs', 'Freyr', 'Granger', 'Granite', 'HJ98', 'Knudson', 'Oklee', 'Steele-ND', and 'Ulen' and the spring barley varieties 'Lacey' and 'Robust' were seeded on May 4 at 105 lbs/A and 98 lbs/A for wheat and barley, respectively. All treatments were applied with a CO_2 pressured backpack type sprayer delivering 10 gpa at 30 psi using 80015 flat-fan nozzles. Herbicides were applied on June 4 and the plant growth regulator was applied on June 9. The experimental design was a strip plot 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 June 4. Environmental conditions are listed below. Crop injury was rated visually. Plant heights and grain yield were measured. Data is summarized by variety and is presented in the tables 1 through 7.

Treatment Date	June 4	June 9
Barley stage	5 leaf	5.5 leaf
Wheat stage	4 to 4.5 leaf	5 leaf
Temperature (°F)		
Air	70	61
Soil	–	63
Relative Humidity (%)	70	66
Soil Conditions	moist	--
Rainfall before Application		
Week 1 (inch)	0.47	1.47
Rainfall after Application		
Week 1 (inch)	1.40	2.39
Week 2 (inch)	2.39	0.0

Flucarbozone + NIS at the 2x rate and AEF 130060 + adjuvant at both rates caused significant crop injury 7 days after application in all but one of the HRSW varieties tested. No significant crop injury could be detected for Granite at 7 days after application for any of the grass herbicides tested. Crop injury decreased over time for all grass herbicides tested. The crop injury observed for either flucarbozone + NIS or AEF 130060 resulted in a reduction in plant height in Alsen, HJ98, and Oklee, but did not effect grain yield. None of the other grass herbicides tested caused any reductions in plant height or grain yield. Flucarbazone, clodinafop, and AE F130060 are not labeled for use in barley and these compounds all resulted in significantly high injury to the barley varieties.

The growth regulator trinexapac-ethyl caused significant reductions in plant height. The 2X rate of trinexapac-ethyl reduced grain yield for Freyr and Briggs but not for any other of the HRSW tested. (Department of Agronomy and Plant Genetics, University of Minnesota, St. Paul).

Table 1. Hard red spring wheat tolerance to postemergence herbicides at Crookston, MN - 2005 (Durgan, Wiersma, and Cameron).

		Alsen				Banton			
		Injury				Injury			
Treatment	Rate	6/9	7/5	Height	Yield	6/9	7/5	Height	Yield
	(lb/A)	(%)	(%)	(inch)	(bu/A)	(%)	(%)	(inch)	(bu/A)
Fenoxaprop & safener[1]	0.084	3	0	31	66	3	0	33	65
Fenoxaprop & safener	0.167	7	0	32	63	5	0	33	62
Flucarbazone + NIS[2]	0.027 + 0.25%	7	2	31	67	3	2	29	64
Flucarbazone + NIS	0.054 + 0.25%	12	13	28	61	12	10	30	59
Trinexapac-ethyl[3]	0.1116	-	17	29	63	-	17	29	60
Trinexapac-ethyl	0.2232	-	37	26	61	-	40	23	55
Clodinafop & cloquintocet [4]	0.05	5	0	32	64	2	0	32	66
Clodinafop & cloquintocet	0.1	13	3	31	69	7	0	32	67
AE F130060 + adjuvant [5]	0.00222 + 1.9%	13	0	32	69	13	0	31	63
AE F130060 + adjuvant	0.00445 + 1.9%	13	3	32	66	12	3	32	66
A12303 + A12127 [7]	0.053 + 0.75%	8	0	31	65	3	0	32	63
A12303 + A12127	0.106 + 0.75%	5	0	31	62	5	0	31	58
Check		0	0	32	68	0	0	32	64
LSD (P=.05)		8	8	2	ns	6	6	4	ns

[1] Puma 1E.
[2] NIS = Class Preference nonionic surfactant.
[3] Palisade EC growth regulator.
[4] Discover NG 0.5E.
[5] Destiny adjuvant distributed by Agriliance, LLC.
[7] A12127 = adjuvant.

Table 2. Hard red spring wheat tolerance to postemergence herbicides at Crookston, MN - 2005 (Durgan, Wiersma, and Cameron).

		Briggs				Freyr			
		Injury				Injury			
Treatment	Rate	6/9	7/5	Height	Yield	6/9	7/5	Height	Yield
	(lb/A)	(%)	(%)	(inch)	(bu/A)	(%)	(%)	(inch)	(bu/A)
Fenoxaprop & safener[1]	0.084	3	0	30	66	5	0	33	72
Fenoxaprop & safener	0.167	5	0	31	61	8	0	33	65
Flucarbazone + NIS[2]	0.027 + 0.25%	7	2	29	60	8	2	33	66
Flucarbazone + NIS	0.054 + 0.25%	13	7	29	53	8	10	31	64
Trinexapac-ethyl[3]	0.1116	-	13	27	60	-	17	30	67
Trinexapac-ethyl	0.2232	-	37	22	49	-	40	27	54
Clodinafop & cloquintocet [4]	0.05	2	0	30	61	0	0	34	66
Clodinafop & cloquintocet	0.1	3	0	31	62	8	0	33	69
AE F130060 + adjuvant [5]	0.00222 + 1.9%	3	0	30	59	8	0	32	68
AE F130060 + adjuvant	0.00445 + 1.9%	7	3	29	60	5	3	33	65
A12303 + A12127 [7]	0.053 + 0.75%	2	0	31	63	5	0	33	67
A12303 + A12127	0.106 + 0.75%	5	0	30	67	3	0	33	58
Check		0	0	29	54	0	0	33	65
LSD (P=.05)		5	7	2	9	5	6	3	8

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Table 3. Hard red spring wheat tolerance to postemergence herbicides at Crookston, MN - 2005 (Durgan, Wiersma, and Cameron).

		Granger				Granite			
		Injury				Injury			
Treatment	Rate	6/9	7/5	Height	Yield	6/9	7/5	Height	Yield
	(lb/A)	(%)	(%)	(inch)	(bu/A)	(%)	(%)	(inch)	(bu/A)
Fenoxaprop & safener[1]	0.084	2	0	35	63	3	0	30	55
Fenoxaprop & safener	0.167	5	0	34	64	7	0	30	54
Flucarbazone + NIS[2]	0.027 + 0.25%	8	2	35	58	8	2	30	50
Flucarbazone + NIS	0.054 + 0.25%	12	7	34	62	13	7	29	52
Trinexapac-ethyl[3]	0.1116	-	13	33	70	-	17	28	49
Trinexapac-ethyl	0.2232	-	40	29	61	-	43	21	42
Clodinafop & cloquintocet [4]	0.05	3	0	36	69	3	0	29	55
Clodinafop & cloquintocet	0.1	10	0	36	70	3	8	30	56
AE F130060 + adjuvant [5]	0.00222 + 1.9%	10	0	36	67	10	0	30	52
AE F130060 + adjuvant	0.00445 + 1.9%	12	3	32	64	8	3	31	55
A12303 + A12127 [7]	0.053 + 0.75%	7	0	35	64	3	0	31	52
A12303 + A12127	0.106 + 0.75%	5	0	35	59	3	0	30	54
Check		0	0	36	66	0	0	30	54
LSD (P=.05)		8	7	4	6	ns	7	2	ns

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Table 4. Hard red spring wheat tolerance to postemergence herbicides at Crookston, MN - 2005 (Durgan, Wiersma, and Cameron).

		HJ98				Knudson			
		Injury				Injury			
Treatment	Rate	6/9	7/5	Height	Yield	6/9	7/5	Height	Yield
	(lb/A)	(%)	(%)	(inch)	(bu/A)	(%)	(%)	(inch)	(bu/A)
Fenoxaprop & safener[1]	0.084	7	0	32	61	7	0	32	66
Fenoxaprop & safener	0.167	12	0	32	60	7	0	30	61
Flucarbazone + NIS[2]	0.027 + 0.25%	8	2	31	56	8	2	30	61
Flucarbazone + NIS	0.054 + 0.25%	20	20	27	55	17	17	28	56
Trinexapac-ethyl[3]	0.1116	-	13	31	62	-	12	29	64
Trinexapac-ethyl	0.2232	-	33	27	53	-	37	24	56
Clodinafop & cloquintocet [4]	0.05	3	0	31	68	2	0	32	64
Clodinafop & cloquintocet	0.1	7	7	31	63	5	3	31	65
AE F130060 + adjuvant [5]	0.00222 + 1.9%	13	0	30	59	15	0	29	64
AE F130060 + adjuvant	0.00445 + 1.9%	10	3	31	62	13	3	30	63
A12303 + A12127 [7]	0.053 + 0.75%	5	0	31	61	5	0	31	64
A12303 + A12127	0.106 + 0.75%	7	0	30	59	8	0	31	57
Check		0	0	31	59	0	0	30	59
LSD (P=.05)		7	10	1	ns	7	10	2	ns

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[3] Palisade EC growth regulator.
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Table 5. Hard red spring wheat tolerance to postemergence herbicides at Crookston, MN - 2005 (Durgan, Wiersma, and Cameron).

		Oklee				Steele-ND			
		Injury				Injury			
Treatment	Rate	6/9	7/5	Height	Yield	6/9	7/5	Height	Yield
	(lb/A)	(%)	(%)	(inch)	(bu/A)	(%)	(%)	(inch)	(bu/A)
Fenoxaprop & safener[1]	0.084	3	0	31	67	2	0	33	66
Fenoxaprop & safener	0.167	3	0	31	64	7	0	33	62
Flucarbazone + NIS[2]	0.027 + 0.25%	5	2	30	62	3	2	33	64
Flucarbazone + NIS	0.054 + 0.25%	10	13	25	54	8	7	32	64
Trinexapac-ethyl[3]	0.1116	-	13	28	64	-	17	30	64
Trinexapac-ethyl	0.2232	-	37	21	54	-	43	29	62
Clodinafop & cloquintocet [4]	0.05	2	0	30	67	3	0	33	69
Clodinafop & cloquintocet	0.1	3	3	30	62	7	3	33	69
AE F130060 + adjuvant [5]	0.00222 + 1.9%	10	0	29	59	8	0	33	65
AE F130060 + adjuvant	0.00445 + 1.9%	7	3	29	56	8	3	33	67
A12303 + A12127 [7]	0.053 + 0.75%	2	0	30	60	7	0	33	64
A12303 + A12127	0.106 + 0.75%	3	0	30	55	7	0	33	66
Check		0	0	29	58	0	0	33	67
LSD (P=.05)		ns	8	3	8	ns	6	ns	ns

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[3] Palisade EC growth regulator.
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[5] Destiny adjuvant distributed by Agriliance, LLC.
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Table 6. Hard red spring wheat tolerance to postemergence herbicides at Crookston, MN - 2005 (Durgan, Wiersma, and Cameron).

		Ulen			
		Injury			
Treatment	Rate	6/9	7/5	Height	Yield
	(lb/A)	(%)	(%)	(inch)	(bu/A)
Fenoxaprop & safener[1]	0.084	5	0	32	58
Fenoxaprop & safener	0.167	5	0	32	59
Flucarbazone + NIS[2]	0.027 + 0.25%	5	2	31	60
Flucarbazone + NIS	0.054 + 0.25%	10	7	31	53
Trinexapac-ethyl[3]	0.1116	-	13	30	61
Trinexapac-ethyl	0.2232	-	40	24	51
Clodinafop & cloquintocet [4]	0.05	5	0	31	60
Clodinafop & cloquintocet	0.1	7	0	32	59
AE F130060 + adjuvant [5]	0.00222 + 1.9%	10	0	31	56
AE F130060 + adjuvant	0.00445 + 1.9%	8	3	32	59
A12303 + A12127 [7]	0.053 + 0.75%	5	0	32	61
A12303 + A12127	0.106 + 0.75%	7	0	31	56
Check		0	0	33	57
LSD (P=.05)		ns	7	2	ns

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Table 7. Barley tolerance to postemergence herbicides at Crookston, MN - 2005 (Durgan, Wiersma, and Cameron).

		Lacey				Robust			
		Injury				Injury			
Treatment	Rate	6/9	7/5	Height	Yield	6/9	7/5	Height	Yield
	(lb/A)	(%)	(%)	(inch)	(bu/A)	(%)	(%)	(inch)	(bu/A)
Fenoxaprop & safener[1]	0.084	18	0	28	86	18	0	30	83
Fenoxaprop & safener	0.167	15	0	30	89	15	0	31	85
Flucarbazone + NIS[2]	0.027 + 0.25%	15	32	26	82	18	27	28	68
Flucarbazone + NIS	0.054 + 0.25%	23	67	22	44	23	63	22	37
Trinexapac-ethyl[3]	0.1116	-	20	26	92	-	13	29	84
Trinexapac-ethyl	0.2232	-	47	22	82	-	37	24	78
Clodinafop & cloquintocet [4]	0.05	13	23	30	89	20	23	30	80
Clodinafop & cloquintocet	0.1	20	27	30	86	25	23	31	77
AE F130060 + adjuvant [5]	0.00222 + 1.9%	20	3	29	85	27	3	31	79
AE F130060 + adjuvant	0.00445 + 1.9%	18	13	29	87	27	13	30	82
A12303 + A12127 [7]	0.053 + 0.75%	0	0	30	94	2	0	30	83
A12303 + A12127	0.106 + 0.75%	0	3	30	93	0	3	32	84
Check		0	0	29	87	0	0	31	85
LSD (P=.05)		6	13	2	10	8	13	4	13

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[3] Palisade EC growth regulator.
[4] Discover NG 0.5E.
[5] Destiny adjuvant distributed by Agriliance, LLC.
[7] A12127 = adjuvant.