

2007 ANNUAL REPORT TO THE  
SASKATCHEWAN FORAGE SEED  
DEVELOPMENT COMMISSION

Herbicide Screening in Red Clover and  
Perennial Ryegrass

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## Herbicide Screening in Established Red Clover

Objective: to determine the tolerance of established red clover to a number of post-emergence herbicides. Three studies were conducted in the Arborfield –Carrot River; however, seed yields were obtained only at the two Arborfield sites.

SITE1: Location: Arborfield

Conclusion: At the first rating date, Pardner caused just acceptable injury at the 2X rate. Unacceptable injury was recorded at the 2X rate of the Pardner / Imazamox (Solo) tank-mix for the first three ratings. At the 2nd and 3rd rating date, the 2X rate of Odyssey also caused unacceptable injury. However, by the time the crop was mature, there was slight injury noted with the 2X rates of Pardner / Solo tank-mix, and the 2X rate of Odyssey. None of the treatments reduced seed yield when compared to the untreated check. The 2X rate of Odyssey, the 1X rate of Solo, both rates of Pardner/Imazamox and the 2X rate of Select were lower yielding than the Basagran standard. The lower yields of Select may be related to broadleaf weed interference and is not likely a result of crop injury. All herbicide treatments yielded similar to the MCPA industry standard.

Crop Name				RED CLOVER	RED CLOVER	RED CLOVER	RED CLOVER	RED CLOVER	
Rating Date				6/5/2007	6/26/2007	7/12/2007	9/12/2007	9/17/2007	
Rating Data Type				Injury	Injury	Injury	Injury	Seed Yield	
Rating Unit				percent	percent	percent	percent	kg/ha	
Assessed By				E. Johnson	E. Johnson	E. Johnson	E. Johnson		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate	Rate	Rate	Rate	
				Unit					
1	Untreated Check				0 f	0 e	3 e	0 b	123 b
2	BASAGRAN	480 SN	1100 G A/HA		3 ef	3 de	2 e	0 b	185 a
	ASSIST	100 SL	2 L/HA						
3	MCPA AMINE	500 SN	280 G A/HA		6 c-f	10 bcd	8 cde	0 b	122 b
4	ODYSSEY 1X	70 WG	30 G A/HA		2 ef	4 cde	9 cde	0 b	146 ab
	MERGE	100 SL	0.5 % V/V						
5	ODYSSEY 2X	70 WG	60 G A/HA		6 def	20 a	24 ab	3 a	106 b
	MERGE	100 SL	0.5 % V/V						
6	IMAZAMOX 1X	70 SG	20 G A/HA		3 ef	8 bcd	6 cde	0 b	128 b
	MERGE	100 SL	0.5 % V/V						
7	IMAZAMOX 2X	70 SG	40 G A/HA		2 f	7 b-e	5 cde	0 b	134 ab
	MERGE	100 SL	0.5 % V/V						
8	PARDNER 1X	280 EC	280 G A/HA		8 b-e	5 b-e	4 de	0 b	145 ab
9	PARDNER 2X	280 EC	560 G A/HA		15 b	11 b	14 bcd	1 b	135 ab
10	PARDNER 1X	280 EC	280 G A/HA		11 bcd	10 bc	16 abc	0 b	107 b
	IMAZAMOX 1X	70 SG	20 G A/HA						
	MERGE	100 SL	0.5 % V/V						
11	PARDNER 2X	280 EC	280 G A/HA		23 a	21 a	26 a	0 b	120 b
	IMAZAMOX 2X	70 SG	20 G A/HA						
	MERGE	100 SL	0.5 % V/V						
12	BASAGRAN 1X	480 SN	1100 G A/HA		6 c-f	1 e	1 e	0 b	140 ab
	IMAZAMOX 2X	70 SG	20 G A/HA						
	MERGE	100 SL	0.5 % V/V						
13	BASAGRAN 2X	480 SN	2200 G A/HA		13 bc	5 b-e	5 cde	1 b	146 ab
	IMAZAMOX 2X	70 SG	20 G A/HA						
	MERGE	100 SL	0.5 % V/V						
14	SELECT 1X	240 EC	47 G A/HA		0 f	0 e	0 e	0 b	142 ab
	AMIGO	100 GL	1 % V/V						
15	SELECT 2X	240 EC	94 G A/HA		0 f	0 e	0 e	0 b	122 b
	AMIGO	100 GL	1 % V/V						
LSD (P=.05)				6.5	6.7	11.2	1.6	53.9	
Standard Deviation				4.6	4.7	7.8	1.1	37.7	
CV				71.76	68.56	96.76	331.23	28.29	
Grand Mean				6.35	6.88	8.07	0.33	133.33	

Means followed by same letter do not significantly differ (P=.05, LSD)

Site 2: Arborfield

Conclusion: At the first two rating dates, Pardner caused just acceptable injury at the 2X rate. Just acceptable injury was recorded at both rating dates with the 2X rate of the Pardner / Imazamox (Solo) tank-mix and the 2X rate of Odyssey. However, by the time the crop was mature, there was only slight injury noted with a few of the treatments. Accidental mowing of the 4th rep after the second rating date meant that only 3 reps could be rated at the last date and seed yields were taken off only 3 reps. The 2X rate of Imazamox (Solo) resulted in the lowest yield even though no visual injury was evident. Other than that, the remaining herbicides yielded similar to the untreated check or the industry standards of Basagran and MCPA Amine.

Crop Name				RED CLOVER	RED CLOVER	RED CLOVER	RED CLOVER
Rating Date				6/26/2007	7/12/2007	9/12/2007	9/17/2007
Rating Data Type				Injury	Injury	Injury	Seed Yield
Rating Unit				percent	percent	percent	kg/ha
Assessed By				E. Johnson	E. Johnson	E. Johnson	
Trt No.	Treatment Name	Form Conc	Form Type Rate Unit				
1	Untreated Check			0 d	0 d	0 c	177 abc
2	BASAGRAN	480 SN	1100 G A/HA	1 d	0 d	0 c	171 bc
	ASSIST	100 SL	2 L/HA				
3	MCPA AMINE	500 SN	280 G A/HA	3 bcd	2 cd	0 c	174 bc
4	ODYSSEY 1X	70 WG	30 G A/HA	7 b	6 bc	0 c	178 abc
	MERGE	100 SL	0.5 % V/V				
5	ODYSSEY 2X	70 WG	60 G A/HA	18 a	16 a	6 a	178 abc
	MERGE	100 SL	0.5 % V/V				
6	IMAZAMOX 1X	70 SG	20 G A/HA	2 d	0 d	0 c	191 ab
	MERGE	100 SL	0.5 % V/V				
7	IMAZAMOX 2X	70 SG	40 G A/HA	4 bcd	1 cd	0 c	128 c
	MERGE	100 SL	0.5 % V/V				
8	PARDNER 1X	280 EC	280 G A/HA	7 b	3 bcd	1 bc	168 bc
9	PARDNER 2X	280 EC	560 G A/HA	16 a	13 a	5 a	183 abc
10	PARDNER 1X	280 EC	280 G A/HA	7 bc	7 b	1 c	185 abc
	IMAZAMOX 1X	70 SG	20 G A/HA				
	MERGE	100 SL	0.5 % V/V				
11	PARDNER 2X	280 EC	280 G A/HA	17 a	16 a	5 a	169 bc
	IMAZAMOX 2X	70 SG	20 G A/HA				
	MERGE	100 SL	0.5 % V/V				
12	BASAGRAN 1X	480 SN	1100 G A/HA	2 cd	0 d	1 bc	233 a
	IMAZAMOX 2X	70 SG	20 G A/HA				
	MERGE	100 SL	0.5 % V/V				
13	BASAGRAN 2X	480 SN	2200 G A/HA	5 bcd	1 cd	3 b	160 bc
	IMAZAMOX 2X	70 SG	20 G A/HA				
	MERGE	100 SL	0.5 % V/V				
14	SELECT 1X	240 EC	47 G A/HA	0 d	0 d	0 c	143 bc
	AMIGO	100 GL	1 % V/V				
15	SELECT 2X	240 EC	94 G A/HA	0 d	0 d	0 c	153 bc
	AMIGO	100 GL	1 % V/V				
LSD (P=.05)				5	5.2	1.9	58.1
Standard Deviation				3.5	3.6	1.2	34.8
CV				61.21	86.02	79.29	20.13
Grand Mean				5.7	4.23	1.47	172.78

Means followed by same letter do not significantly differ (P=.05, LSD)

Site 3: Carrot River

Conclusion: The area on the field where the study was placed ended up being quite non-uniform; therefore, rating was difficult and it was decided not to take yields on the study. The injury from the Pardner/ Solo tank-mix was just acceptable at the first rating date; however, the 1X rate was acceptable at the second rating date. Other ratings were acceptable.

Crop Name					RED CLOVER	RED CLOVER
Rating Date					6/26/2007	7/12/2007
Rating Data Type					Injury	Injury
Rating Unit					percent	percent
Assessed By					E. Johnson	E. Johnson
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit		
1	Untreated Check				0 d	0 c
2	BASAGRAN	480 SN		1100 G A/HA	4 cd	3 abc
	ASSIST	100 SL		2 L/HA		
3	MCPA AMINE	500 SN		280 G A/HA	2 cd	2 bc
4	ODYSSEY 1X	70 WG		30 G A/HA	4 cd	4 abc
	MERGE	100 SL		0.5 % V/V		
5	ODYSSEY 2X	70 WG		60 G A/HA	8 bc	9 ab
	MERGE	100 SL		0.5 % V/V		
6	IMAZAMOX 1X	70 SG		20 G A/HA	3 cd	0 c
	MERGE	100 SL		0.5 % V/V		
7	IMAZAMOX 2X	70 SG		40 G A/HA	6 bcd	5 abc
	MERGE	100 SL		0.5 % V/V		
8	PARDNER 1X	280 EC		280 G A/HA	4 cd	2 bc
9	PARDNER 2X	280 EC		560 G A/HA	6 bcd	2 bc
10	PARDNER 1X	280 EC		280 G A/HA	12 ab	6 abc
	IMAZAMOX 1X	70 SG		20 G A/HA		
	MERGE	100 SL		0.5 % V/V		
11	PARDNER 2X	280 EC		280 G A/HA	15 a	10 a
	IMAZAMOX 2X	70 SG		20 G A/HA		
	MERGE	100 SL		0.5 % V/V		
12	BASAGRAN 1X	480 SN		1100 G A/HA	7 bcd	1 bc
	IMAZAMOX 2X	70 SG		20 G A/HA		
	MERGE	100 SL		0.5 % V/V		
13	BASAGRAN 2X	480 SN		2200 G A/HA	8 abc	4 abc
	IMAZAMOX 2X	70 SG		20 G A/HA		
	MERGE	100 SL		0.5 % V/V		
14	SELECT 1X	240 EC		47 G A/HA	0 d	0 c
	AMIGO	100 GL		1 % V/V		
15	SELECT 2X	240 EC		94 G A/HA	0 d	0 c
	AMIGO	100 GL		1 % V/V		
LSD (P=.05)					7.1	7.4
Standard Deviation					4.9	5.2
CV					97.13	166.72
Grand Mean					5.08	3.1

Means followed by same letter do not significantly differ (P=.05, LSD)

Overall conclusion on Established Red Clover Studies:

Pardner, Imazamox-Basagran tank-mix, and Select all appear safe on established red-clover. Odyssey tolerance is questionable; however Dan Cole and Calvin Yoder with Alberta Agriculture, Food and Rural Development (AAFRD) have 5 established trials completed (3 with seed yields) and a decision should be made based on the combined Saskatchewan -Alberta data. The yield reduction reported with Imazamox (Solo) in the one trial raises a flag, and Alberta data should be consulted as well.

Recommendations:

No further field trials are recommended until a complete inventory of Alberta data is completed. The Saskatchewan Forage Seed Development Council would be further ahead to contract submission writing to get products registered. AAFRD have extensive data on Pardner in established red clover, and including the Saskatchewan data there is more than enough data for registration. If data gaps exist after the data mining, then more field trials are warranted.

## SEEDLING RED CLOVER TRIAL

Only one trial was initiated in 2007, near Nipawin.

Conclusion: The 2X rate of Pardner and Imazamox tank-mix resulted in just acceptable injury at the first rating date. At the second rating date, all treatments resulted in acceptable levels of crop injury. It was also noted that application of the highest rate of Pardner / Imazamox tank-mix and both rates of the Basagran/ Imazamox tank-mix resulted in excellent weed control. Seed yields will be obtained in 2008.

Crop Name					RED CLOVER	RED CLOVER
Rating Date					8/1/2007	9/12/2007
Rating Data Type					Injury	Injury
Rating Unit					percent	percent
Assessed By					E. Johnson	E. Johnson
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit		
1	Untreated Check				0 d	0 a
2	MCPA AMINE	500	SN	280 G A/HA	2 cd	0 a
3	BASAGRAN	480	SN	1100 G A/HA	2 cd	0 a
	ASSIST	100	SL	2 L/HA		
4	IMAZAMOX	70	SG	20 G A/HA	5 bcd	0 a
	MERGE	100	SL	0.5 % V/V		
5	IMAZAMOX	70	SG	40 G A/HA	6 abc	0 a
	MERGE	100	SL	0.5 % V/V		
6	PARDNER	280	EC	280 G A/HA	6 bc	2 a
7	PARDNER	280	EC	560 G A/HA	8 ab	0 a
8	PARDNER	280	EC	280 G A/HA	5 bc	1 a
	IMAZAMOX	70	WG	20 G A/HA		
	MERGE	100	SL	0.5 % V/V		
9	PARDNER	280	EC	560 G A/HA	11 a	1 a
	IMAZAMOX	70	WG	40 G A/HA		
	MERGE	100	SL	0.5 % V/V		
10	BASAGRAN	480	SL	1100 G A/HA	5 bcd	3 a
	IMAZAMOX	70	WG	20 G A/HA		
	MERGE	100	SL	0.5 % V/V		
11	BASAGRAN	480	SL	2200 G A/HA	9 ab	2 a
	IMAZAMOX	70	WG	40 G A/HA		
	MERGE	100	SL	0.5 % V/V		
LSD (P=.05)					4.8	3.1
Standard Deviation					3.3	2.1
CV					64.16	286.31
Grand Mean					5.14	0.75

Means followed by same letter do not significantly differ (P=.05, LSD)

### Recommendations:

Odyssey was supposed to be included in the trial; however, there appeared to be a problem with the treatment (no weed control was evident). AAFRD has at least 2 seedling trials with Odyssey and Odyssey is a federal priority in 2008. Therefore, there is no need for Saskatchewan Forage Seed Development Council to fund this treatment further. Further studies on Pardner /Imazamox and Basagran / Imazamox tank-mixes in seedling red clover are warranted.

## Herbicide Screening in Seedling Perennial Ryegrass

Two trials were initiated in 2007 – one at Lethbridge and one at Scott. The perennial ryegrass trial was seeded early at Lethbridge. The Scott site was seeded in August. Seed yields will be obtained in 2008.

Lethbridge site: Perennial ryegrass tolerated all pre- and post emergence treatments. Seed yields will be taken in 2008.

Crop Code					Perennial Rye	Perennial Rye	Perennial Rye	Perennial Rye
Rating Data Type					Injury	Injury	Injury	Injury
Rating Unit					percent	percent	percent	percent
Rating Date					5/31/2007	6/12/2007	6/27/2007	7/12/2007
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit				
1	Untreated				0 a	0 a	0 a	0 a
2	MCPA-Amine	500	EC	560 G A/HA	0 a	0 a	0 a	0 a
3	PrePass A: Florasulam	50	SC	5 G A/HA	0 a	0 a	0 a	0 a
	PrePass B: Vantage Plus	360	EC	450 G A/HA				
4	PrePass A: Florasulam	50	SC	10 G A/HA	0 a	0 a	0 a	0 a
	PrePass B: Vantage Plus	360	EC	900 G A/HA				
5	Express: tribenuron-methy	50	SG	7.5 G A/HA	0 a	0 a	0 a	0 a
	Weathermax	540	EC	450 G A/HA				
6	Express: tribenuron-methy	50	SG	15 G A/HA	0 a	0 a	0 a	0 a
	Weathermax	540	EC	900 G A/HA				
7	Frontline A:florasulam	50	SC	5 G A/HA	0 a	0 a	0 a	0 a
	Frontline B: MCPA ester	500	EC	350 G A/HA				
8	Frontline A:florasulam	50	SC	10 G A/HA	0 a	0 a	0 a	0 a
	Frontline B: MCPA ester	500	EC	700 G A/HA				
9	Spectrum A:florasulam	50	SC	5 G A/HA	0 a	0 a	0 a	0 a
	Spectrum B: Curtail-M	330	EC	490 G A/HA				
10	Spectrum A:florasulam	50	SC	10 G A/HA	0 a	0 a	0 a	0 a
	Spectrum B: Curtail-M	330	EC	980 G A/HA				
11	Prestige A:fluroxypyr	180	EC	142 G A/HA	0 a	0 a	0 a	0 a
	Prestige B:Curtail-M	330	EC	660 G A/HA				
12	Prestige A:fluroxypyr	180	EC	284 G A/HA	0 a	0 a	0 a	0 a
	Prestige B:Curtail-M	330	EC	1320 G A/HA				
13	Curtail-M	330	EC	660 G A/HA	0 a	0 a	0 a	0 a
14	Curtail-M	330	EC	1320 G A/HA	0 a	0 a	0 a	0 a
LSD (P=.05)					0	0	0	0
Standard Deviation					0	0	0	0
CV					0	0	0	0
Grand Mean					0	0	0	0

Means followed by same letter do not significantly differ (P=.05, LSD)

Scott site:

Conclusions: All of the first ratings indicated no injury. Some injury was noted with the 2X rates of Spectrum and GF-1674 (pyroxsulam) at the second rating. At the 3<sup>rd</sup> and 4<sup>th</sup> ratings, pyroxsulam ratings were just acceptable. More ratings will be conducted in the spring and seed yields will be obtained.

Crop Name						Perennial ryegrass	Perennial ryegrass	Perennial ryegrass	Perennial ryegrass
Rating Date						9/21/2007	9/26/2007	10/3/2007	10/31/2007
Rating Data Type						Injury	Injury	Injury	Injury
Rating Unit						percent	percent	percent	percent
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Growth Stage				
1	UNTREATED WEED FREE CHECK					0 a	0 e	0 d	0 c
2	MCPA AMINE	500 SN		560 G A/HA	2-4 LF	0 a	2 e	0 d	0 c
3	Buctril M	560 SN		554 G A/HA	2-4 LF	0 a	0 e	0 d	0 c
4	BuctrilM	560 SN		1108 G A/HA	2-4 LF	0 a	0 e	0 d	0 c
5	pyrasulfutole (AE0317309)	248 SN		205 G A/HA	2-4 LF	0 a	2 e	0 d	0 c
6	pyrasulfutole (AE0317309)	248 SN		410 G A/HA	2-4 LF	0 a	2 e	0 d	0 c
7	FRONTLINE	550 EC			2-4 LF	0 a	5 d	0 d	0 c
	FLORASULAM	50 SC		5 G A/HA					
8	MCPA ESTER	500 EC		350 G A/HA					
	FRONTLINE	550 EC			2-4 LF	0 a	8 ab	0 d	6 bc
	FLORASULAM	50 SC		10 G A/HA					
	MCPA ESTER	500 EC		700 G A/HA					
9	SPECTRUM	380 EC			2-4 LF	0 a	6 cd	0 d	0 c
	FLORASULAM	50 SC		5 G A/HA					
	CURTAIL M	330 EC		490 G A/HA					
10	SPECTRUM	380 EC			2-4 LF	0 a	10 a	3 c	0 c
	FLORASULAM	50 SC		10 G A/HA					
	CURTAIL M	330 EC		980 G A/HA					
11	PRESTIGE	510 EC			2-4 LF	0 a	1 e	0 d	0 c
	FLUROXYPYR	180 EC		142 G A/HA					
	CURTAIL M	330 EC		660 G A/HA					
12	PRESTIGE	510 EC			2-4 LF	0 a	5 d	0 d	0 c
	FLUROXYPYR	180 EC		284 G A/HA					
	CURTAIL M	330 EC		1320 G A/HA					
13	GF-1674	30 OD		15 G A/HA	2-4 LF	0 a	7 bc	11 b	13 ab
	Assist	1000 SN		0.8 % V/V					
14	GF-1674	30 OD		30 G A/HA	2-4 LF	0 a	10 a	15 a	18 a
	Assist	1000 SN		0.8 % V/V					
LSD (P=.05)						0	2.4	2	6.9
Standard Deviation						0	1.7	1.4	4.8
CV						0	41.88	66.02	183.86
Grand Mean						0	4.04	2.07	2.63

Means followed by same letter do not significantly differ (P=.05, LSD)