The Seed Head
Fact sheet # 27

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Effects of Infinity FX and Infinity FX + MCPA Ester on Established Meadow Bromegrass Grown for Seed

Trials conducted by:
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PRFSA 1-877-630-2198
PRFSA Fact sheet 24

Please Note:

The URMULE indicates herbicide tolerance trials on a specific crop have been conducted and the crop has shown good tolerance to the herbicide in trials conducted to date. The company with the herbicide does not assume any responsibility if there is damage to the crop from using the herbicide. URMULE are useful to inform growers, seed companies and agronomists what herbicides are available for use on grass and legume seed crops.

Introduction

Controlling broadleaf weeds in established grasses grown for seed production is necessary to ensure a high-yielding and high-quality seed crop is produced. The Peace Region Forage Seed Association, AAFC Beaverlodge and SARDA Ag Research conduct herbicide tolerance trials on established grass seed crops each year. The information generated from the trials is used to inform growers, seed companies and crop input businesses as to what herbicides can safely be used on grass seed crops. If data collected from herbicide crop tolerance trials show good potential for use on a particular grass seed crop, the trials are summarized and used to prepare and submit a User Requested Minor Use Label Expansion (URMULE) as long as the herbicide company selling the product agrees to it.

Infinity (pyrasulfotole+bromoxynil) is a Bayer Crop Sciences herbicide for broadleaf weed control in cereal crops. There are several URMULE for the use of Infinity on both seedling and established grasses grown for seed including creeping red fescue, timothy, bromegrasses and perennial ryegrass. Bayer Crop Sciences added the active ingredient fluroxypyr to Infinity which is Infinity FX. Infinity FX provides a wider range of broadleaf weed control than Infinity, particularly on weeds such as cleavers, buckwheat and kochia. Infinity FX can also be tank-mixed with MCPA Ester for stronger and more consistent weed control. Trials were initiated in 2018 to evaluate the tolerance of established meadow bromegrass seed crops to Infinity FX and Infinity FX+MCPA Ester.

Meadow bromegrass seed field

Methods

Trials were conducted on growers' fields with the exception of 2018 which was conducted at the AAFC Beaverlodge Research Farm. Uniform areas were selected to reduce variability in data collected from the trials. Experimental design for each location was a randomized complete block design with four replications. Plot size was 2 m x 10 m. Herbicide treatments were applied with a 2 m hand-held boom (4 TeeJet 80001 nozzles) pressurized by a propane sprayer. The sprayer and walking speed were calibrated to provide 100 l/ha of water at a pressure of 270 kPa. Herbicide treatments were applied at 1x and 2x the recommended rates registered for use in cereal crops (Table 1). Site information and application dates are shown in Table 2. Visual crop tolerance ratings were conducted at three dates throughout the year but are generally 7 days after treatment (DAT), 28 DAT and prior to harvest. Visual crop tolerance ratings are done using the scale shown in Table 3.

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Methods (continued)

For 2018 trials conducted at the AAFC Beaverlodge Research Farm, harvesting was done by collecting samples from two rows by the length of the plot using a Japanese rice binder. The harvested area was 2.6 m^2. Samples were placed in cotton bags, dried and later thrashed with a stationary thrasher. For trials conducted on growers' fields, harvesting was done by straight combining down the middle of each plot with a Wintersteiger plot combine. The harvested area was 15 m^2. Samples were dried, cleaned and weighed to determine seed yield. Germinations and 1000 SWT assessments were done on all of the trials. Data was statistically analyzed using ANOVA means separation (p=0.05, Student-Newman-Keuls).

Table 1. Treatments applied to established meadow bromegrass seed crops

Treatment	Active Ingredient (AI)	Concentration (g/l)	AI Rate (kg/ha)	Product Rate (l/ha)
Infinity FX 1x	pyrasulfotole bromoxynil fluroxypyr	31.1 174.3 72	0.031 0.174 0.072	1.0
Infinity FX 2x	pyrasulfotole bromoxynil fluroxypyr	31.1 174.3 72	0.062 0.348 0.144	2.0
Infinity FX 1x + MCPA Ester	pyrasulfotole bromoxynil fluroxypyr MCPA Ester	31.1 174.3 72 600	0.031 0.174 0.072 0.276	1.0 0.460

Table 2. Site and application information

Site	Age of Stand (years)	Application Date	Crop Stage	Harvest Date	Harvest Area (m^2)
2019 Valhalla	2	2019-05-21	Prior to stem elongation	2019-08-08	15
2018 Spirit River	2	2018-05-22	Prior to stem elongation	2018-08-15	15
2018 Beaverlodge	2	2018-05-23	Prior to stem elongation	2018-08-01	2.6

Table 3. Visual crop tolerance rating of phytotoxic effects

Phytotoxicity Range (percent rating)	Assessment of Injury
0-9	Very little injury
10-20*	Just acceptable; slight discoloration and/or stunting
>20-30	Not acceptable
>30	Severe

**20% or less is considered acceptable injury*

Herbicide tolerance trial on established meadow bromegrass in Spirit River, Alberta (2018)

Results and Discussion

Tables 4, 5 and 6 show results from three trials evaluating the effects of Infinity FX and Infinity FX+MCPA Ester on meadow bromegrass seed crops. Figure 1 summarizes yields from treatments as percent of check at all sites. No visual crop injury was observed during the trials. No significantly different seed yields, dockage, germination or 1000 SWTs were observed when compared to the check.

Table 4. Visual crop tolerance ratings, seed yield, dockage, germination and 1000 SWT of meadow bromegrass following herbicide applications, 2019 Valhalla

Treatment	Visible Injury 7 DAT	Visible Injury 21 DAT	Visible Injury 69 DAT	Seed Yield (kg/ha)	Dockage (%)	Germination (%)	1000 SWT (g)
Infinity FX 1x	0	0	0	605	13.3	100	5.273
Infinity FX 2x	0	0	0	583	12.8	99.0	5.397
Infinity FX 1x + MCPA Ester	0	0	0	550	12.6	100	5.276
Check	0	0	0	570	13.3	100	5.337
CV%	-	-	-	16.4	5.9	1.6	1.9
LSD (p=0.05)	-	-	-	NSD	NSD	NSD	NSD

CV - coefficient of variance; LSD - least significant difference; NSD - not significantly different

Table 5. Visual crop tolerance ratings, seed yield, germination and 1000 SWT of meadow bromegrass following herbicide applications, 2018 Spirit River

Treatment	Visible Injury 9 DAT	Visible Injury 37 DAT	Visible Injury 85 DAT	Seed Yield (kg/ha)	Germination (%)	1000 SWT (g)
Infinity FX 1x	0	0	0	748	99.5	5.987
Infinity FX 2x	0	0	0	692	96.5	5.062
Infinity FX 1x + MCPA Ester	0	0	0	764	98.0	5.306
Check	0	0	0	801	96.0	5.251
CV%	-	-	-	9.6	2.5	11.3
LSD (p=0.05)	-	-	-	NSD	NSD	NSD

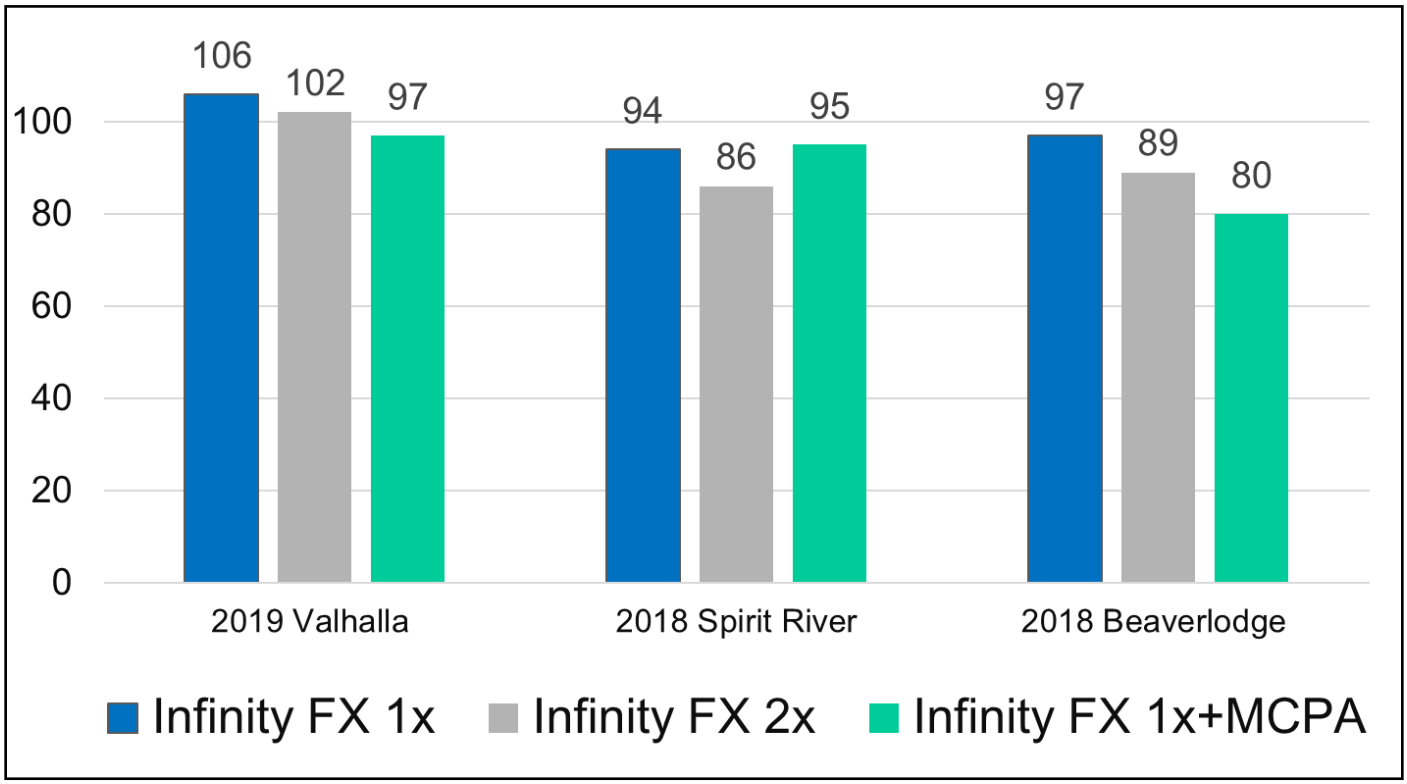
CV - coefficient of variance; LSD - least significant difference; NSD - not significantly different

Table 6. Visual crop tolerance ratings, seed yield, germination and 1000 SWT of meadow bromegrass following herbicide applications, 2018 Beaverlodge

Treatment	Visible Injury 8 DAT	Visible Injury 23 DAT	Visible Injury 62 DAT	Seed Yield (kg/ha)	Germination (%)	1000 SWT (g)
Infinity FX 1x	0	0	0	457	98.0	6.541
Infinity FX 2x	0	0	0	419	98.0	6.362
Infinity FX 1x + MCPA Ester	0	0	0	373	98.5	6.215
Check	0	0	0	471	97.1	6.345
CV%	-	-	-	27.2	2.3	4.5
LSD (p=0.05)	-	-	-	NSD	NSD	NSD

CV - coefficient of variance; LSD - least significant difference; NSD - not significantly different

Figure 1. Tolerance of established meadow bromegrass seed crops to Infinity FX and Infinity FX+MCPA Ester (% seed yield of check)



Summary

- Infinity FX at 1x, Infinity FX at 2x and Infinity FX+MCPA Ester at 1x the recommended rates used in cereal crops applied to established meadow bromegrass seed stands did not cause any visual injury, seed yield loss, reductions in germination or reductions in 1000 SWTs. Germination and 1000 SWT assessments were conducted on all of the trials.
- Infinity FX with or without MCPA Ester appears to be a safe herbicide for use on established meadow bromegrass grown for seed production.
- A URMULE is now in place for the use of Infinity FX on seedling and established meadow bromegrass grown for seed production.

References

Yoder, C., and SARDA. 2019. *Tolerance of Established Meadow Bromegrass to Infinity FX and Cirpreme, 2019, Valhalla. ARM DAT File.*

Yoder, C., and SARDA. 2018. *Tolerance of Established Meadow Bromegrass to Infinity FX and Cirpreme, 2018, Spirit River. ARM DAT File.*

Yoder, C., and AAFC Beaverlodge. 2018. *Tolerance of Seven Established Grasses to Infinity FX and Cirpreme, 2018, Beaverlodge. ARM DAT File.*

Bayer Crops Sciences Canada. Infinity FX Label

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