The Seed Head
Fact sheet # 31

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Effects of Cirpreme XC and Cirpreme XC + MCPA Ester on Established Bromegrasses Grown for Seed

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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 herbicide company does not assume any responsibility if there is damage to the crop from using the herbicide. URMULE is useful to inform growers, seed companies and agronomists what herbicides are available for use on minor crops.

Smooth bromegrass field

Introduction

Controlling broadleaf weeds in established grasses grown for seed production is necessary to ensure the higher yield and quality of produced seed. 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 submit a User Requested Minor Use Label Expansion (URMULE) as long as the herbicide company selling the product agrees to it.

Cirpreme XC (florasulam+halauxifen+clopyralid) is a Corteva Agriscience herbicide for annual and perennial broadleaf weed control in wheat and barley. Cirpreme XC is a mixture of two Group 4 (halauxifen+clopyralid) and one Group 2 (florasulam) active ingredients providing a wide spectrum of weed control. The active ingredient halauxifen works well across variable weather conditions and weed stages. It is particularly strong on cleavers even at later growth stages. Cirpreme XC provides control of many hard-to-kill broadleaf weeds including Canada thistle and scentless chamomile, and also provides suppression of night-flowering catchfly and white cockle. Cirpreme XC also controls barnyard grass and because of this it should not be assumed that Cirpreme XC would be safe on all grass seed crops. The addition of MCPA Ester to Cirpreme XC increases the number of broadleaf weeds controlled.

Trials were initiated in 2019 to evaluate the tolerance of established bromegrass seed crop to spring-applied Cirpreme XC with and without the addition of MCPA Ester.

Methods

Trials were conducted on growers' fields. 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 3 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 completed 7 days after treatment (DAT), 28 DAT and prior to harvest. Visual crop tolerance ratings are done using the scale shown in Table 3.

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 and dockage. Germination, 1000 SWT and moisture content at harvest assessments were completed on seed from several of the sites. Data were statistically analyzed using ANOVA means separation (p=0.05, Student-Newman-Keuls).

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Table 1. Herbicide treatments applied to established bromegrass in the spring

Treatment	Active Ingredient (AI)	Concentration	AI Rate (kg/ha)	Product Rate
Cirpreme XC + Agral 90 1x (Cirpreme XC 1x)	halauxifen florasulam clopyralid Agral 90	20% 20% 600 g/l	0.005 0.005 0.075 0.25% v/v	25 g/ha 125 ml/ha 250 ml/ha
Cirpreme XC + Agral 90 2x (Cirpreme XC 2x)	halauxifen florasulam clopyralid Agral 90	20% 20% 600 g/l	0.01 0.01 0.15 0.25% v/v	50 g/ha 250 ml/ha 250 ml/ha
Cirpreme XC + MCPA Ester 1x (Cirpreme XC + MCPA 1x)	halauxifen florasulam clopyralid MCPA Ester	20% 20% 600 g/l 600 g/l	0.005 0.005 0.075 0.350	25 g/ha 125 ml/ha 580 ml/ha

Table 2. Site and application information

Site	Age of Stand (years)	Application Date	Crop Stage	Harvest Date
2019 Meadow Brome Valhalla	2	2019-05-21	Early stem elongation	2019-08-08
2019 Smooth Brome Whitemud	1	2019-05-23	Prior to stem elongation	2019-08-29
2021 Smooth Brome Beaverlodge	2	2021-05-21	Prior to stem elongation	2021-08-09
2021 Meadow Brome Valhalla	2	2021-05-21	Prior to stem elongation	2021-08-04

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*

Straight combining meadow bromegrass

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)
Cirpreme XC 1x	18	13	0	509	14.7 ab	99	5.122 bc
Cirpreme XC 2x	22	18	0	551	15.3 a	98	5.062 c
Cirpreme XC + MCPA 1x	19	16	0	514	13.2 bc	99	5.274 abc
Check	0	0	0	570	13.3 bc	100	5.337 ab
CV%	-	-	-	16.4	5.9	1.6	2.0
LSD (p=0.05)	-	-	-	NSD	1.2	NSD	0.152

CV - coefficient of variance; LSD - least significant difference; NSD - not significantly different
a,b,c - results followed by the same letter do not significantly differ (p = 0.05, Student-Newman-Keuls)

Results and Discussion

Tables 4 through 7 show results from four trials evaluating the effects of Cirpreme XC with and without MCPA Ester on bromegrass seed crops. Figure 1 summarizes yields from treatments as percent of check at all sites. Visual crop injury was observed with all Cirpreme XC treatments at all of the sites, including prior to harvest at three of the four sites. In 2019, percent seed dockage significantly increased and 1000 SWT significantly decreased with one or more Cirpreme XC treatments when compared to the check and no significantly different germination percentages were observed when compared to the check. In Beaverlodge, moisture percentages were significantly higher with all Cirpreme XC treatments when compared to the check indicating a slight delay in maturity as a result of the treatments. In Whitemud, seed yields were significantly reduced with all Cirpreme XC treatments when compared to the check and a trend for reduced seed yields with all Cirpreme XC treatments, though not statistically significant, was observed at two of the three sites.

Table 5. Visual crop tolerance ratings, seed yield, dockage, germination and 1000 SWT of smooth bromegrass following herbicide applications, 2019 Whitemud

Treatment	Visible Injury 7 DAT	Visible Injury 36 DAT	Visible Injury 84 DAT	Seed Yield (kg/ha)	Dockage (%)	Germination (%)	1000 SWT (g)
Cirpreme XC 1x	10	21	18	399 a	12.5 a	97.5	2.955 b
Cirpreme XC 2x	10	20	20	346 a	13.5 a	98.0	3.320 a
Cirpreme XC + MCPA 1x	10	18	11	406 a	12.0 a	97.5	3.452 a
Check	0	0	0	480 b	10.0 b	97.0	3.367 a
CV%	-	-	-	9.1	7.5	3.6	5.1
LSD (p=0.05)	-	-	-	58	1.2	NSD	0.252

CV - coefficient of variance; LSD - least significant difference; NSD - not significantly different
a,b - results followed by the same letter do not significantly differ (p = 0.05, Student-Newman-Keuls)

Table 6. Visual crop tolerance ratings, seed yield and dockage of meadow bromegrass following herbicide applications, 2021 Valhalla

Treatment	Visible Injury 20 DAT	Visible Injury 33 DAT	Visible Injury 75 DAT	Seed Yield (kg/ha)	Dockage (%)
Cirpreme XC 1x	15	20	15	220	3.9
Cirpreme XC 2x	20	26	23	144	4.2
Cirpreme XC + MCPA 1x	10	15	18	202	5.4
Check	0	0	0	261	4.7
CV%	-	-	-	26.6	15.7
LSD (p=0.05)	-	-	-	NSD	NSD

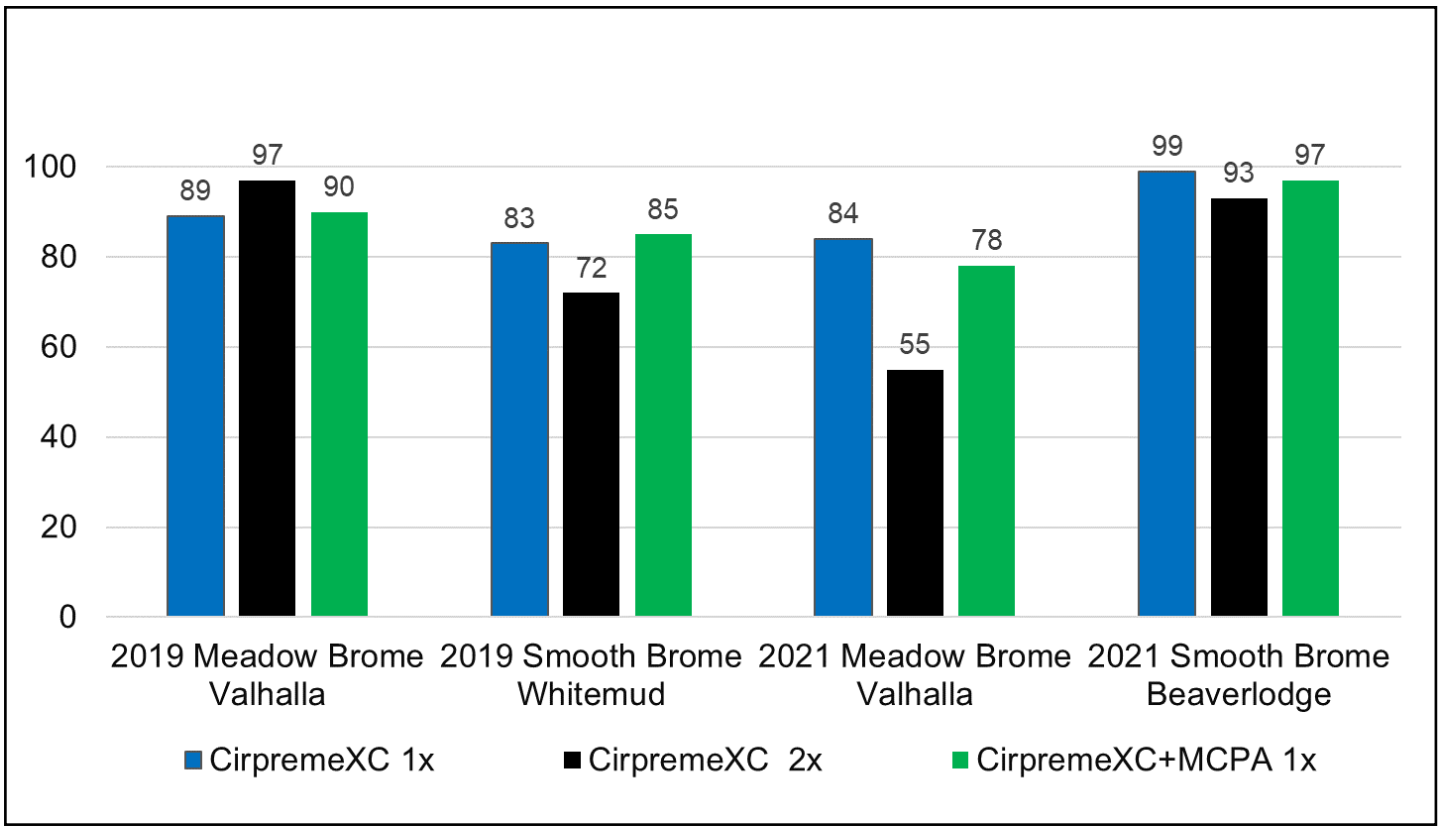
CV - coefficient of variance; LSD - least significant difference; NSD - not significantly different

Table 7. Visual crop tolerance ratings, seed yield, moisture and dockage of smooth bromegrass following herbicide applications, 2021 Beaverlodge

Treatment	Visible Injury 11 DAT	Visible Injury 20 DAT	Visible Injury 76 DAT	Seed Yield (kg/ha)	Moisture (%)	Dockage (%)
Cirpreme XC 1x	20	15	3	470	8.7 ab	12.0
Cirpreme XC 2x	31	29	13	439	8.9 a	12.7
Cirpreme XC + MCPA 1x	16	14	0	460	8.1 b	11.5
Check	0	0	0	472	7.3 c	11.4
CV%	-	-	-	8.4	4.4	5.1
LSD (p=0.05)	-	-	-	NSD	0.6	NSD

CV - coefficient of variance; LSD - least significant difference; NSD - not significantly different
a,b,c - results followed by the same letter do not significantly differ (p = 0.05, Student-Newman-Keuls)

Figure 1. Tolerance of established bromegrass seed crops to spring-applied Cirpreme XC with and without MCPA Ester (% seed yield of check)



Summary

- Spring-applied Cirpreme XC at 1x and 2x the recommended rates used in wheat and barley crops, with and without MCPA Ester, applied to both established meadow and smooth bromegrass caused visual injury at all four sites. Visual damage was still noticeable prior to harvest at three of the four sites.
- All Cirpreme XC treatments significantly reduced seed yields on smooth bromegrass at Whitemud in 2019. Although there were not statistically significant differences in bromegrass seed yields between the check and Cirpreme XC treatments at the other three sites, there was a trend for reduced yields at two of the sites. Cirpreme XC treatments also increased percent seed dockage over the check.
- Seed germination and 1000 SWT assessments were conducted at two of the four sites. None of the treatments reduced seed germination. 1000 SWT was reduced by all Cirpreme XC treatments at Valhalla and by two of the three treatments at Whitemud.
- Data collected from the trials indicate that caution should be used if Cirpreme XC is considered for use on bromegrass seed crops as there will be potential for visual injury and seed yield loss. Based on the data collected from the trials in 2019 and 2021, spring-applied Cirpreme XC should not be considered for a URMULE.

References

Yoder, C., and SARDA. 2019. *Tolerance of Established Meadow Bromegrass to Infinity FX and Cirpreme XC, 2019 Valhalla. ARM DAT File.*
Yoder, C., and SARDA. 2019. *Tolerance of Established Smooth Bromegrass to Infinity FX and Cirpreme XC, 2019 Whitemud. ARM DAT File.*
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Corteva Agriscience Canada. Cirpreme XC Label

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