The Tolerance Of Foxtail Millet (*Setaria Italica* (L.) P. Beauv.) To Combinations Of Fluroxypyr, Clopyralid, And MCPA

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Foxtail millet (*Setaria italica* (L.) P. Beauv., golden German millet, Italian millet) use as a fodder in Saskatchewan is currently increasing especially for swath grazing. Using Foxtail millet in swath grazing can extend the grazing season and reduce the cost of feeding cattle in the winter (McCaughey, et al. 2002; May et al. 2007). For this practice to be successful inexpensive weed control measures are needed. Foxtail millet's growth in the spring can be slow under cool conditions, allowing broadleaf weeds to get established and reduce the biomass of the foxtail millet. Currently, only bromoxynil and bentazone (Basagran Forté) are registered for use in Saskatchewan. The weed sprectrum of bromoxynil does not control several weeds including Canada thistle (*Cirsium arvense* (L.) Scop.) and cleavers (*Galium aparine* L.). Bentazone is expensive and requires larger water volumes than growers are willing to use. Therefore, improved control options for foxtail millet are required.

Objective

To test the tolerance of foxtail millet to commercially available combinations of bromoxynil clopyralid, fluroxypyr, and MCPA.

Materials and Methods

Herbicide combinations

1.	Untreated		weed free
2.	Buctril M	1X	280 g ai/ha MCPA, + 280 g ai/ha bromoxynil
3.	Buctril M	2X	560 g ai/ha MCPA, + 560 g ai/ha bromoxynil
4.	Curtail M	1X	560 g ai/ha MCPA, + 100 g ai/ha clopyralid
5.	Curtail M	2X	1120 g ai/ha MCPA, + 200 g ai/ha clopyralid
6.	Trophy	1X	562 g ai/ha MCPA + 108 g ai/ha fluroxypyr
7.	Trophy	2X	1124 g ai/ha MCPA + 216 g ai/ha fluroxypyr
8.	Prestige	1X	560 g ai/ha MCPA, + 100 g ai/ha clopyralid + 144 g ai/ha fluroxypyr
9.	Prestige	2X	1120 g ai/ha MCPA, + 200 g ai/ha clopyralid + 288 g ai/ha fluroxypyr

2X treatments were applied to simulate an over lap with the 1x rate applied twice.

Locations: Indian Head, SK in 2004, 2005, 2006 and 2007
Scott, SK in 2006 and 2007
Experimental Design: A randomized complete block design with 4 replicates.
Cultivar: Golden German millet
Crop stage: 2 - 6 leaves
Target Seeding date: June 1
Seeding Rate: 22 kg ha^{-1}

Nitrogen fertilizer: 40 kg ha^{-1}
Phosphorous: 20 kg ha^{-1}
Spray Volume: 111 L ha^{-1}
Spray Pressure: 275

Statistical analysis

Proc Mixed procedure of SAS (Littell et al., 1996)
Herbicide treatments were considered fixed, site years were considered random
A Tukey-Kramer mean separation test was used.

Results and Discussion

Crop Injury (Fig. 1)

7-14 days after application

- No treatment exceeded 20% injury
- Buctril M at the 1X and 2X and Prestige at the 2X rate had higher levels of crop injury than the weed free check

21-35 days after application

- Prestige at the 2X rate had higher levels of crop injury than the weed free check

42-56 days after application

-no difference among treatments

Crop Dry Matter (Fig. 2)

-no difference among treatments
- numerical the lowest yielding treatment, Prestige 2X was 7% below the weed free check

Conclusions

All four herbicide combinations were save to use on foxtail millet when grown in Saskatchewan and other areas with similar environmental conditions during the growing season.

References

Littell, R.C.,. Milliken, G.A, Stroup, W.W., and Wolfinger R.D. 1996. SAS System for Mixed Models. SAS Institute, Cary NC.

May, W. E., Klein, L.H., Lafond, G. P. McConnell, J.T. and Phelps, S.M. 2007. The Suitability of Cool-and Warm-Season Annual Cereal Species for Winter Grazing in Saskatchewan. Can. J. Plant Sci.**87:***in press*

McCaughey, P., Small, J., Scott, S. and Irvine, B. 2002. Foxtail millet and corn: New crops to extend grazing season and cut feeding costs. Agriculture and Agri-Food Canada, Branson Research Centre, News Note, Brandon, MB. Pub. No. 227.

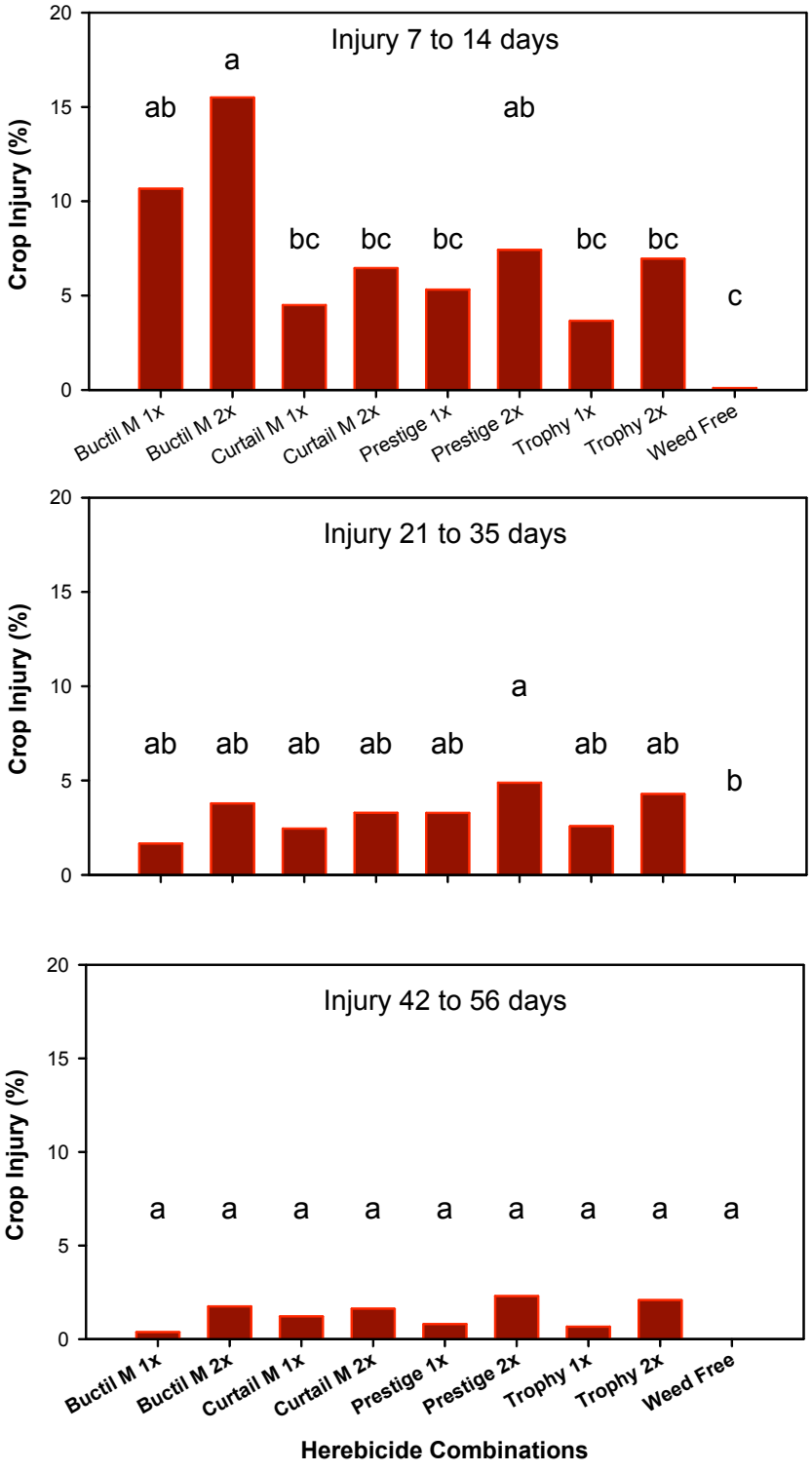

Fig 1.

Fig. 1. Observed crop injury to foxtail millet at 7 to 14, 21 to 35 and 42 to 56 days by several herbicide combinations with data combined across site-years.

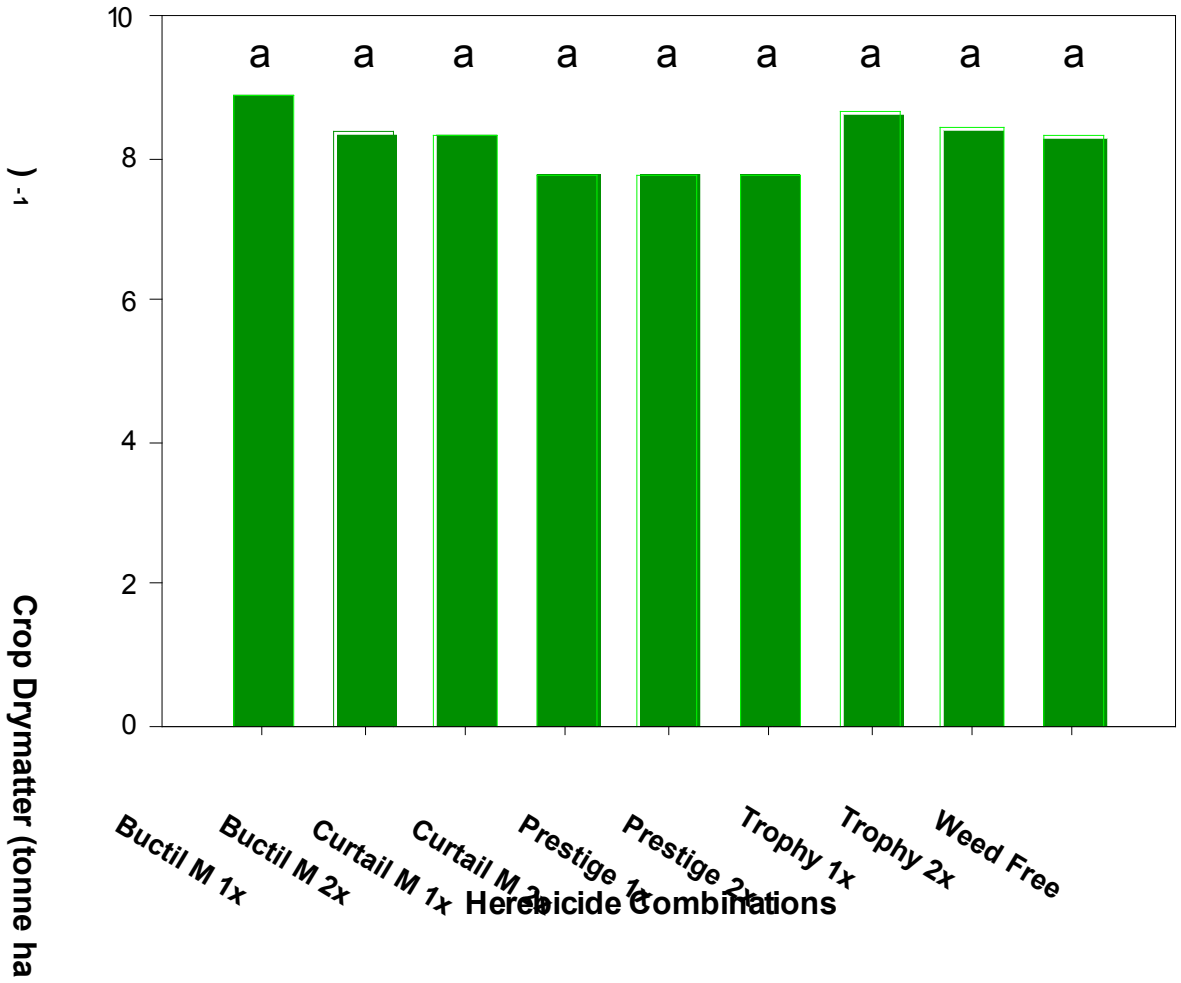

Fig. 2. Crop drymatter of foxtail millet at the end of growing season for different herbicide treatments with data combined across site-years.