

TOLERANCE OF TEFF TO HERBICIDES

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Introduction

Teff (*Eragrostis tef*), a warm season annual grass native to Ethiopia, is grown in Oregon for forage, hay and grain. There are no herbicides registered for the control of broadleaf or grass weeds in teff. A preliminary field study was conducted to evaluate the tolerance of teff to a variety of herbicides. This study will guide future research related to weed management in teff.

Methods

The 2009 study was conducted at David McCready's farm near Lebanon, OR. The experimental design was a randomized complete block with four replications and the plots were 8 ft by 25 ft. Herbicide treatments were applied with a unicycle sprayer calibrated to deliver 20 gallons per acre at 20 psi. Preemergence herbicides evaluated in the study were mesotrione (Callisto), dimethenamid-p (Outlook), diuron (Karmex), sulfentrazone (Spartan) and pendimethalin (Prowl H₂O). Postemergence herbicides evaluated were flufenacet-metribuzin (Axiom), metribuzin (Sencor), pyrosulfotole-bromoxynil (Huskie), dicamba (Clarity), carfentrazone (Aim), pyroxsulam (Powerflex), pinoxaden (Axial XL), flucarbazone (Everest), mesosulfuron (Osprey), florasulam-MCPA (Orion), clopyralid (Stinger), MCPA amine (Rhomene), clodinafop (Discover), florasulam-fluroxypyr-pyroxulam (Goldsky), pyraflufen (Vida), fluroxypyr (Starane), aminopyralid (Milestone), 2,4-D amine (Weedar64), nicosulfuron (Accent), metsulfuron (Ally), chlorsulfuron (Glean) and tribenuron (Express).

The soil type at McCready Farm is a Coburg silty clay loam with a pH of 5.5 and an organic matter content of 4.4%. The weed species present at the site were redroot pigweed, common lambsquarter and barnyard grass. Visual evaluations of crop injury were conducted periodically after herbicide applications. The teff crop was harvested on September 14, 2009 with a forage harvester.

Results

The final visual ratings of crop injury are included in Table 1. Mesotrione, dimethenamid-p and pendimethalin treatments resulted in 100% injury to the teff when applied preemergence. Mesotrione, pinoxaden and clodinafop treatments resulted in 60% or more injury to the teff when applied postemergence.

There was no teff yield from the preemergence applications of mesotrione, dimethenamid-p and pendimethalin. The clodinafop treatment caused 80% injury to the teff and did not control the weed species present in the study area; therefore, we did not harvest the plot.

The postemergence treatments that caused little or no teff injury and warrant further evaluation are flufenacet-metribuzin, metribuzin, flucarbazone, clopyralid, florasulam-fluroxypyr-pyroxulam, pyraflufen, fluroxypyr, metsulfuron, chlorsulfuron, and tribenuron. However, some of these treatments did not control the weed species spectrum present at the McCready site. Therefore, because the yield data in Table 1 represents total biomass (teff and weeds in some cases) the forage yield should be interpreted with caution. The two treatments at this site that resulted in the highest levels of weed control, teff safety and teff yields were postemergence applications of metsulfuron and chlorsulfuron.

2,4-D amine has been submitted to IR-4 program, but there are no herbicides registered for use in teff. The only chemical option available for weed management is to apply glyphosate to emerged weeds prior to planting teff.

Table 1. Visible injury and forage yield of teff McCready Farm, 2009.

Treatment	Rate (lb a.i./a)	Applica- tion code ¹	Teff	
			Injury ² (%)	Forage yield (tons/a)
check	0		0	6.0
Mesotrione	0.188	A	98	0
dimethenamid-p	0.98	A	88	0
diuron	1.5	A	48	6.1
sulfentrazone	0.25	A	28	5.5
pendimethalin	3	A	93	0
flufenacet-metribuzin	0.42	B	1	6.6
metribuzin	0.141	B	0	6.4
mesotrione	0.188	B	63	5.7
pyrasulfotole- bromoxnyl	0.186	B	33	6.0
dicamba	2	B	16	6.3
carfentrazone	0.012	B	4	6.8
pyroxsulam	0.0164	B	10	5.5
pinoxaden	0.054	B	70	7.2
flucarbazone	0.026	B	5	5.3
mesosulfuron	0.0134	B	10	6.7
florasulam-MCPA	0.315	B	6	7.0
clopyralid	0.125	B	0	6.0
MCPA amine	1	B	11	7.9
clodinafop	0.25	B	78	0
florasulam-fluroxypyr- pyroxsulam	0.105	B	8	4.8
pyraflufen	0.0033	B	5	5.1
fluroxypyr	0.125	B	1	7.1
aminopyralid	0.11	B	20	6.2
2,4-D amine	2	B	14	7.2
nicosulfuron	0.046	B	20	6.6
metsulfuron	0.0155	B	0	7.6
chlorsulfuron	0.0078	B	1	7.6
tribenuron	0.0078	B	1	6.4
LSD (0.05)			--	1.7

¹A – Applied July 15, 2009

B – Applied August 5, 2009

² Evaluated August 17, 2009