

# INFLUENCE OF PREVIOUS CROP AND HERBICIDE TREATMENTS ON RATAIL FESCUE CONTROL IN SEEDLING KENTUCKY BLUEGRASS GROWN UNDER COLUMBIA BASIN CONDITIONS

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## Introduction

A trial was established under center pivot irrigation at a USDA-ARS research farm near Paterson, WA, in autumn of 2009 to evaluate the influence of previous cropping history on rattail fescue (*Vulpia myuros*) in Kentucky bluegrass (KBG) grown for seed. Rattail fescue is a winter annual grass weed that is a critical problem in seedling KBG since no herbicide treatments have been identified to selectively control this weed during establishment of KBG.

## Methods and Materials

Initial treatments included winter wheat seeded in autumn of 2009, or green pea, potato, or sweet corn planted in spring of 2010. Production details for these crops are outlined in Table 1. Following the production of these crops, a seedbed was prepared, and plot areas were split and received either an application of metam-sodium fumigation (see footnote in Table 1.) or no treatment, then conventionally seeded to “Barduke” Kentucky bluegrass on August 30, 2010. The KBG planting was then followed by a series of herbicide treatments (Tables 2, 3a-3c). Preemergence (PRE) treatments were applied September 7, early postemergence (EPOST) treatments were applied October 6, and late postemergence (LPOST) treatments were applied November 11, 2010. All postemergence (EPOST, LPOST) treatments included a crop oil concentrate (COC) at 1% v/v and 32% N solution at 2.5% v/v. Plots were 6 ft by 30 ft and replicated four times. All herbicides were applied in 16 gal/a water. Crop injury (Table 2) and weed control (Tables 3a-3c) were evaluated on November 12, 2010.

## Results and Discussion

Metam-sodium applied at 20 gal/a had a slight effect on reducing rattail fescue, but by itself, did not provide sufficient residual control to be cost effective. Broadleaf weed control from metam-sodium was evident, early season, but was negligible by mid-season. Herbicide treatments with Callisto® (mesotrione) provided nearly complete control of broadleaf weeds (Tables 3a-c) and several summer annual grasses such as lovegrass (data not shown), with no apparent KBG crop injury (Table 2). Callisto treatments applied PRE or EPOST were equally effective. Callisto did not appear to reduce rattail fescue density. The addition of Beacon® (primisulfuron) at the low rate tested (0.187 oz/a) caused visible reduction of KBG growth with no additional weed control benefit compared to Callisto, alone.

By far, the largest impact on rattail fescue populations was the result of previous cropping. The KBG planting following winter wheat was a complete loss due to overwhelming densities of rattail fescue and downy brome (data not shown). KBG plantings following spring pea, sweet corn, or potatoes were completely successful with negligible to slight levels of rattail fescue and downy brome. The preplant metam-sodium fumigation followed by Callisto treatment provided nearly complete control of all weeds encountered in this trial, if the previous crop was other than winter wheat (Tables 3a-c).

## Acknowledgements

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Table 1. Production details for crops grown prior to seedling Kentucky bluegrass. Paterson, WA, 2010.

Crop Variety	Potato Norkota	Sweet corn	Winter wheat WB 528 (SWW)	Green pea Dakota
Preplant tillage	disked then furrowed	disked then harrowed	minimum tillage	disked then harrowed
Seeding rate	2400 lb/a	31,500 seeds/a	90 lb/a	200 lb/a
Herbicide treatment	Outlook PRE 14 fl oz/a Chateau PRE 1.5 oz/a Sencor 75DF PRE 0.33 lb/a	Outlook PRE 14 fl oz/a Callisto PRE 6 fl oz/a	Bronate POST 1.5 pt/a	MCPA POST 0.5 pt/a + Basagran POST 1 pt/a
Seeding date	9 April 2010	16 April 2010	Sept 2009	24 Mar 2010
Harvest date	26 July 2010	5 August 2010	9 August 2010	9 August
Additional note	--	9 August flail chop	9 August flail chop	9 August flail chop

Table 2. Kentucky bluegrass crop injury from herbicide treatments<sup>2</sup>. Evaluated on November 12, 2010. Paterson, WA, 2010.

Herbicide	Rate (oz/a)	Timing <sup>1</sup>	-----(% visible injury) -----	
			No fumigation	Metam-sodium
No herbicide	--	--	0	0
Callisto / Callisto	3 / 3	PRE/EPOST	0	0
Callisto / Callisto+Beacon	3 / 3+0.187	PRE/EPOST	18	12
Callisto+Beacon	6+0.187	EPOST	12	12
Callisto / Callisto+Beacon	3 / 3+0.187	EPOST/LPOST	0	0
Callisto+Beacon / Callisto	3+0.187 / 3	EPOST/LPOST	10	15
Callisto+Beacon	3+0.187	LPOST	-- <sup>3</sup>	-- <sup>3</sup>
Callisto+Everest	3+0.6	LPOST	-- <sup>3</sup>	-- <sup>3</sup>
LSD (0.05) for fumigant				NS
LSD (0.05) for herbicide				4

<sup>1</sup> Metam-sodium applied on 20 August 2009 @ 20 ga/a with a broadcast boom sprayer and immediately incorporated to a 2-3 inch depth with a power tiller.

<sup>2</sup> Evaluations of potato ground, only.

<sup>3</sup> Evaluations made only 1 day after LPOST treatments, so these values not reported.

Table 3a. Weed control in Kentucky bluegrass following **potato**. Paterson, WA, 2010.

Herbicide	Rate (oz/a)	Timing <sup>1</sup>	----- (plants / m <sup>2</sup> ) -----			
			No fumigation	Metam-sodium	No fumigation	Metam-sodium
			Rattail fescue		Broadleaf weeds	
No herbicide	--	--	4	1	12	13
Callisto / Callisto	3 / 3	PRE/EPOST	4	0	0	0
Callisto / Callisto+Beacon	3 / 3+0.187	PRE/EPOST	5	0	0	0
Callisto+Beacon	6+0.187	EPOST	3	0	0	0
Callisto / Callisto+Beacon	3 / 3+0.187	EPOST/LPOST	7	0	0	0
Callisto+Beacon / Callisto	3+0.187 / 3	EPOST/LPOST	7	0	0	3
Callisto+Beacon	3+0.187	LPOST	3 <sup>2</sup>	0 <sup>2</sup>	12 <sup>2</sup>	19 <sup>2</sup>
Callisto+Everest	3+0.6	LPOST	3 <sup>2</sup>	0 <sup>2</sup>	16 <sup>2</sup>	14 <sup>2</sup>
LSD (0.05) for fumigant				NS		NS
LSD (0.05) for herbicide				NS		7

<sup>1</sup> PRE treatments applied 7 September 2010, EPOST applied 6 October, and LPOST applied 11 November, 2010. Weed control evaluated on 12 November, 2010. Postemergence (EPOST, LPOST) treatments included a crop oil concentrate (COC) at 1% v/v and 32% N solution at 2.5% v/v.

<sup>2</sup> Evaluations made only 1 day after LPOST treatments, so these values do not reflect expected final weed control.

Table 3b. Weed control in Kentucky bluegrass following **sweet corn**. Paterson, WA, 2010.

Herbicide	Rate (oz/a)	Timing <sup>1</sup>	No fumigation	Metam- sodium	No fumigation	Metam- sodium
			Rattail fescue	Broadleaf weeds		
No herbicide	--	--	9	1	21	24
Callisto / Callisto	3 / 3	PRE/EPOST	3	0	1	0
Callisto / Callisto+Beacon	3 / 3+0.187	PRE/EPOST	7	0	1	0
Callisto+Beacon	6+0.187	EPOST	2	0	1	0
Callisto / Callisto+Beacon	3 / 3+0.187	EPOST/LPOST	9	2	0	1
Callisto+Beacon / Callisto	3+0.187 / 3	EPOST/LPOST	5	0	1	0
Callisto+Beacon	3+0.187	LPOST	5 <sup>2</sup>	2 <sup>2</sup>	23 <sup>2</sup>	24 <sup>2</sup>
Callisto+Everest	3+0.6	LPOST	3 <sup>2</sup>	1 <sup>2</sup>	30 <sup>2</sup>	23 <sup>2</sup>
LSD (0.05) for fumigant			NS		NS	
LSD (0.05) for herbicide			NS		5	

<sup>1</sup>PRE treatments applied 7 September 2010, EPOST applied 6 October, and LPOST applied 11 November, 2010. Weed control evaluated on 12 November, 2010. Postemergence (EPOST, LPOST) treatments included a crop oil concentrate (COC) at 1% v/v and 32% N solution at 2.5% v/v.

<sup>2</sup>Evaluations made only 1 day after LPOST treatments, so these values do not reflect expected final weed control.

Table 3c. Weed control in Kentucky bluegrass following **green processing pea**. Paterson, WA, 2010.

Herbicide	Rate (oz/a)	Timing <sup>1</sup>	No fumigation	Metam- sodium	No fumigation	Metam- sodium
			Rattail fescue	Broadleaf weeds		
No herbicide	--	--	7	6	19	24
Callisto / Callisto	3 / 3	PRE/EPOST	9	2	0	0
Callisto / Callisto+Beacon	3 / 3+0.187	PRE/EPOST	5	3	0	6
Callisto+Beacon	6+0.187	EPOST	7	2	0	1
Callisto / Callisto+Beacon	3 / 3+0.187	EPOST/LPOST	2	5	1	1
Callisto+Beacon / Callisto	3+0.187 / 3	EPOST/LPOST	4	4	1	1
Callisto+Beacon	3+0.187	LPOST	5 <sup>2</sup>	3 <sup>2</sup>	13 <sup>2</sup>	17 <sup>2</sup>
Callisto+Everest	3+0.6	LPOST	7 <sup>2</sup>	3 <sup>2</sup>	14 <sup>2</sup>	15 <sup>2</sup>
LSD (0.05) for fumigant			NS		NS	
LSD (0.05) for herbicide			NS		10	

<sup>1</sup>PRE treatments applied 7 September 2010, EPOST applied 6 October, and LPOST applied 11 November, 2010. Weed control evaluated on 12 November, 2010. Postemergence (EPOST, LPOST) treatments included a crop oil concentrate (COC) at 1% v/v and 32% N solution at 2.5% v/v.

<sup>2</sup>Evaluations made only 1 day after LPOST treatments, so values do not reflect expected final weed control.