

EVALUATION OF FUNGICIDES FOR CONTROL OF ERGOT IN KENTUCKY BLUEGRASS, 1996

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Abstract

*During the 1996 season fungicides evaluated for control of ergot (*Claviceps purpurea*) included Punch (fusilazole), Tilt (propiconazole), Quadris (azoxystrobin), and Orthorix, along with surfactants Penaturf Sylgard 309, and a combination of Halt, sulfur, and copper in combination with fungicides or as the second of a double application. The Powell Butte, Oregon, location was infested with ergot at 1 sclerotia/ft² on March 25, 1996. Because of low levels of ergot infection at both locations, efficacy data was inconclusive.*

Introduction

Ergot, caused by a fungus (*Claviceps purpurea*), is an important flower-infecting pathogen in grass seed production regions of the Pacific Northwest. Of the grass species grown for seed in Oregon, Kentucky bluegrass (*Poa pratensis*) is particularly affected by ergot. Traditional control has been through open field burning, which has partially suppressed the disease.

Previous fungicide evaluations in central Oregon from 1992 through 1995 indicate excellent ergot control with Punch (fusilazole), for which there are no plans for registration in the United States. Suppression of ergot has been provided by Tilt (propiconazole) and Folicur (tebuconazole). As a result of this research, and similar fungicide evaluations by William Johnston at Washington State University, ergot suppression was added to the Tilt label in 1995 through a Special Local Need 24(c) Registration. Registration of Folicur for use on grass seed is expected.

Methods and Materials

During the 1996 season, fungicides evaluated for control of ergot were conducted in a commercial field of 'Gnome' Kentucky bluegrass on the Agency Plains north of Madras, and in a 'Coventry' Kentucky bluegrass plot at the Central Oregon Agricultural Research Center, Powell Butte, Oregon, location. The Powell Butte location was infested with ergot at 1 sclerotia/11² on March 25, 1996. Punch, Tilt, Quadris, and Orthorix were evaluated during the 1996 season. Surfactants Penaturf, Sylgard 309, and a combination of Halt, sulfur, and copper were also evaluated in combination with fungicides or as the second of a double application.

Plots 10 ft X 20 ft were replicated five times in a randomized complete block design.

Materials were applied using a 9-foot CO₂-pressurized boom sprayer with 8003 TwinJet nozzles at 40 psi and 30 gal/a water. Sylgard 309 at 16 fl oz/100 gal and R-56 at 1 pt/100 gal were applied in combination with all fungicides, except as indicated in the tables. Treatments were applied at the Agency Plains location on June 5 and June 19, 1996 and at the Powell Butte site on June 15 and June 26, 1996. The first treatments were applied at early anthesis on the Agency Plains and at the initiation of anthesis at Powell Butte. Plots in the commercial field on the

Agency Plains were covered with 4 mil polyethylene to prevent contamination during aerial application of Tilt on June 18 and June 27, 1996.

One hundred panicle samples were randomly collected from each plot on July 8 on the Agency Plains and July 15 at Powell Butte. Number of panicles with sclerotia, total sclerotia per sample, panicles with honeydew, and seed weight were determined per sample for each plot.

Results and Discussion

The level of ergot infection at both locations was very low, making separation between control provided by the different fungicide treatments difficult. Tilt at 8 oz/a and split 4 oz/a applications provided the greatest control when evaluating panicles with sclerotia at the Agency Plains location. Results for Quadris were mixed, with a trend for excellent control at the Powell Butte location, but poor results on the Agency Plains. Weight per sample and percent germination were unaffected by fungicide treatments.

Table 1. Evaluation of fungicides applied for ergot control to 'Gnome' Kentucky bluegrass on the Agency Plains near Madras, OR, 1996.

Fungicide Treatments	Rate of Product		Panicles With sclerotia (no.)	Total Sclerotia Per sample (no.)	Weight Per sample (g)	Seed Germination (%)
	June 5	June 19				
	(fl oz/a)					
Punch'	28		0.6 ab	0.6 b	5.7	85
Tilt'	8		0.4 b	0.4 b	5.6	84
Tilt + Penaturf	8	48	0.8 ab	0.8 b	5.5	84
Tilt + Silgard ²	8	32	1.4 ab	1.4 ab	5.3	80
Tilt + Tilt'	4	4	0.4 b	0.4 b	5.8	69
Tilt + Tilt'	8	8	0.8 b	0.8 b	5.8	81
Tilt + Tilt ^o	8	8	0.6 ab	0.6 b	5.6	73
Tilt + Tilt ^{'''}	6	6	0.8 ab	1.0 b	4.9	85
Tilt/Penaturf + Tilt/Penaturf [†]	8/48	8/48	0.8 ab	1.0 b	5.0	86
Tilt/Orthorix + Tilt/Orthorix [†]	8/64	8/64	1.0 ab	1.2 ab	5.7	74
Tilt/Halt + Tilt/Halt ^{†5}	8/16	8/16	1.2 ab	1.2 ab	5.4	78
Quadris + Quadris ^{''}	4	4	1.2 ab	1.2 ab	5.5	87
Untreated			2.6 a	3.2 a	5.0	87
LSD P<0.05					NS	NS

[†]Silgard at 16 fl oz/100 gal and R-56 at 1 pt/100 gal applied with all treatments except Tilt + Penaturf, Tilt + Silgard and the arial application of Tilt at 6 oz/a.

² On the June 19^{'''} application rate if product was fl oz/100 gal.

[†]Crop oil concentrate (COC) applied at 1% in combination with fungicides.

[†]Applied by air in combination with 8 oz/100 gal Celexone sticker in 10 gal/a water

⁵Includes 16 fl oz each of copper and sulfur products in combination with Halt on the June 5th application.

Means in the same column with different letters are significantly different at P<0.05.

Table 2. Evaluation of fungicides applied for ergot control to 'Coventry' Kentucky bluegrass at the Central Oregon Agricultural Research Center, Powell Butte, OR, 1996.

Fungicide Treatments	Rate of Product		Panicles With sclerotia	Total Sclerotia Per sample	Weight Per sample	Seed Germination			
	June 15	June 26							
	(fl oz/a)		(no.)	(no.)	(g)	(%)			
Punch'	28		0.2	b	0.4	b	3.6	a	88
Tilt'	8		12	b	1.2	b	3.9	a	87
Tilt + Penaturf	8	48	0.2	b	0.2	b	4.1	a	84
Tilt + Silgard ¹	8	32	0.8	b	0.8	b	4.1	a	79
Tilt + Tilt'	4	4	0.6	b	0.6	b	3.6	a	81
Tilt + Tilt'	8	8	0	b	0	b	3.8	a	91
Tilt + Tilt''	8	8	0.2	b	0.2	b	4.1	a	86
c, Tilt/Penaturf + Tilt/Penaturf	8/48	8/48	0	b	0	b	2.4	b	72
Tilt/Orthorix + Tilt/Orthorix'	8/64	8/64	0.2	b	0.2	b	4.1	a	80
Tilt/Halt + Tilt/Halt' ¹⁵	8/16	8/16	0.4	b	0.6	b	4.6	a	82
Quadris + Quadris' ^{1b}	4	4	0	b	2.4	a	4.4	a	80
Untreated					0	b	4.4	a	83
LSD P<0.05					6.8	a			NS

¹Silgard at 16 fl oz/100 gal and R-56 at 1 pt/100 gal applied with all treatments except Tilt + Penaturf, Tilt + Silgard. ² On the June 26th application rate of product was fl oz/100 gal.

³Crop oil concentrate (COC) applied at 1% in combination with fungicides.

Includes 16 fl oz each of copper and sulfur products in combination with Halt on the June 15th application.

Means in the same column with different letters are significantly different at P<0.05.