

EVALUATION OF FUNGICIDES FOR CONTROL OF ERGOT IN KENTUCKY BLUEGRASS, 1997

Marvin Butler, Steve N. Alderman, and Fred Crowe

Abstract

During the 1997 season, fungicides evaluated for control of ergot in Kentucky bluegrass (*Poa pratensis*) included Tilt (propiconazole), Folicur (tebuconazole), Quadris (azoxystrobin), and Orthorix, along with surfactants Penaturf, Sylgard 309, and crop oil concentrate (COC). The Powell Butte location was infested with *Claviceps purpurea* at 1 sclerotia/ft² on December 20, 1996. The level of ergot infection at Henderson Flat was very low. At the Powell Butte location, where inoculum was high, a double application of Tilt at 8 oz/a applied at the initiation of anthesis and 10 days later was the most effective. High rates of applied Penaturf and Sylgard 309 appeared to reduce seed weight.

Introduction

Ergot, caused by the 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 to 1996 indicate excellent ergot control with Punch, for which there are no plans for registration in the United States. Suppression of ergot has been provided by Tilt and Folicur. 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. Folicur was also recently registered for use on grass seed.

Methods and Materials

During the 1997 season, fungicides were evaluated for control of ergot by trials conducted in a commercial field of 'Georgetown' Kentucky bluegrass at Henderson Flat, Culver, Oregon, and in a 'Coventry' Kentucky bluegrass plot at the Central Oregon Agricultural Research Center, Powell Butte location. The Powell Butte location was infested with ergot at 1 sclerotia/ft² on December 20, 1996. Tilt, Folicur, Quadris, and Orthorix were evaluated during the 1997 season. Surfactants Penaturf, Sylgard 309, and crop oil concentration (COC) were also evaluated in combination with fungicide treatments.

Plots 10 ft x 20 ft were replicated four times in a randomized complete block design. Materials were applied using a 9-ft CO, 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, but not when Penaturf, Sylgard 309, or Orthorix were applied

alone. COC was applied at 1 percent v/v with single and double applications of Quadris, and a double application of Tilt. Treatments were applied at Henderson Flat on June 2 and on June 13, and at Powell Butte on May 30 and on June 9, 1997. The first treatments were applied at the initiation of anthesis at both locations. Plots in the commercial field at Henderson Flat were covered with 4 mil polyethylene to prevent contamination during aerial application of Tilt on June 6 and on June 20, 1997.

One hundred panicle samples were randomly collected from each plot on July 3 at Henderson Flat and on July 11 at Powell Butte. Number of panicles with sclerotia, total sclerotia per sample, panicles with honeydew, seed weight, and percentage of germination were determined per sample for each plot.

Results and Discussion

The level of ergot infection at Henderson Flat was extremely low, with only one sclerotia found in the 400 panicles from the untreated plots. Counting sclerotia in the treated plots was discontinued, but seed cleaning, seed weight, and percentage of germination were determined.

At the Powell Butte location which was infested with ergot sclerotia, disease levels averaged 741 sclerotia per 100 panicle samples in the untreated plots (Table 1). All fungicide treatments significantly reduced sclerotia per sample, with the best treatment being two applications of Tilt at 8 oz/a. Penaturf, Orthorix and COC in combination with the 8 oz/a Tilt treatments did not significantly alter its performance

Tilt applied as a single 8 oz/a application or as a double 4 oz/a application was not significantly different, but the trend was for slightly better control with the double application. The trend also indicated that Tilt at 8 oz/a followed by a Penaturf treatment provided better control than Tilt followed by Sylgard 309, which was better than Tilt applied alone. The performance of the new fungicide Quadris at 12 oz/a was similar to Folicur at 8 oz/a when applied as a double treatment.

The presence of honeydew followed a similar trend to the number of sclerotia per sample. There was no consistent difference between treatments in weight per sample or 1,000 seed weight across both locations. However, a reduction in sample weight has been observed following application of Penaturf at high rates in evaluations during previous years. Percentage of germination was not affected by treatments at Powell Butte. At Henderson Flat there was a statistical difference between a single application of Tilt at 8 oz/a at 69 percent and a double application of Folicur at 8 oz/a at 87 percent. It would appear that this difference is an artifact rather than a real difference because a double application of Tilt at 8 oz had a germination of 83 percent.

Table 1. Evaluation of fungicides applied for ergot control to 'Coventry' Kentucky bluegrass at the COARC Powell Butte site in central Oregon on May 30 and June 9, 1997.

Fungicide Treatment	Rate		Panicles with sclerotia (%)	Total sclerotia per sample (no.)		Total honeydew per sample (no.)		Weight per sample (g)		1000 Seed Weight (g)		Germination (%)
	May 30	June 9		(fl oz/a)	(no.)	(no.)	(g)	(g)	(%)			
Tilt'	8		71 ab	303 be	99 a	3.65	0.385 ab		82			
Folicur	8		73 ab	228 be	79 a	4.15	0.403 a		91			
Quadris (COO	12		78 ab	374 b	96 a	3.78	0.402 a		91			
Tilt + Tilt	4	4	68 be	234 be	93 a	3.5	0.386 ab		92			
Folicur + Folicur	4	4	65 be	194 be	92 a	3.38	0.391 ab		93			
Tilt + Tilt	8	8	21 e	35 c	6 d	3.45	0.373 b		96			
Folicur + Folicur	8	8	46 cd	108 be	11 d	3.3	0.400 a		91			
Tilt (COC) + Tilt (COC)	8	8	33 de	87 c	7 d	3.23	0.392 ab		96			
Quadris (COC)	12	12	46 cd	108 be	23 cd	3.75	0.402 a		95			
+ Quadris (COC)												
ui Tilt + Penaturf	8	48	63 be	234 be	38 be	3.2	0.380 ab		87			
+ Sylgard 309	8	323	53 bcd	181 be	23 cd	3.25	0.394 ab		90			
Tilt/Penaturf+Tilt Penaturf	8/48	8/48	33 de	105 be	4 d	3.6	0.393 ab		85			
Tilt/Orthorix +Tilt/Orthorix	8/64	8/64	26 de	76 c	8 d	3.63	0.385 ab		85			
Untreated			92 a	741 a	99 a	4.3	0.391 ab		84			
						NS			NS			

'Sylgard 309 16 fl oz/100 gal and R-56 at 1 pt/100 gal applied with all treatments except when Penaturf, Sylgard 309, or Orthorix were applied alone.

²crop oil concentrate (COC) applied at 1% in combination with fungicides

³fl oz/100 gals

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