EVALUATION OF FUNGICIDES FOR POWDERY MILDEW AND STRIPE RUST CONTROL IN KENTUCKY BLUEGRASS IN CENTRAL OREGON, 1998

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Abstract

Fungicides were evaluated in replicated plots for powdery mildew *(Erysiphe graminis)* and stripe rust *(Puccinia striifarmis)* control in Kentucky bluegrass *(Poa pratensis)* during the spring of 1998. Two trials for powdery mildew control were conducted with different sets up fungicide treatments, and one trial for rust control.

Tilt with Microthiol, or alone, and Bayleton provided the best control of powdery mildew in the early trial, with Rally providing the best control in the late evaluation. BAS 500 and Stratego provided the best stripe rust control.

Introduction

Kentucky bluegrass *(Poa pratensis)* remains a valuable component of the agricultural industry in central Oregon despite acreage declined to 5,400 acres in 1998 as acres of rough bluegrass increased to 5,300. The level of powdery mildew and stripe rust infection is dependent on weather conditions in the spring. Powdery mildew *(Erysiphe graminis)* typically appeared earlier in the spring when temperatures are between 60 and 70°F under humid conditions. The appearance of stripe rust *(Puccinia striiforrnis)* usually followed powdery mildew during late spring when temperatures had increased and free moisture was available.

Several new fungicides are expected to be available which may have activity on powdery mildew and stripe rust. The objective of this research is to evaluate these new products against those historically used on Kentucky bluegrass in central Oregon.

Methods and Materials

Plots 10 ft x 22 ft were replicated four times in a randomized complete block design. Treatments were applied with a CO_2-pressurized, hand-held boom sprayer at 40 psi and 20 gal/a water. TwinJet 8002 nozzles were used to improve fungicide coverage. Silwet at 1 qt/100 gal was applied with all treatments. Plots were evaluated pre- and post-treatment using a rating scale of 0 (no symptoms) to 5 (total coverage).

Two fungicide evaluations for powdery mildew control in Kentucky bluegrass were conducted in a commercial `Geronimo' field near Madras, Oregon. Tilt (propiconazole) at 4 fl oz/a, Tilt at 4 fl oz/a plus Microthiol (sulfur) at 2 lb/a, Folicur (tebuconazole) at 4 fl oz/a, Bayleton (triadimefon) at 4 fl oz/a, Quadris (azoxystrobin) at 6 and 12 fl oz/a, and Microthiol at 5 lb/a were applied to the first set of plots April 17, 1998. Plots were evaluated before treatment April 16, and aftertreatments on April 28, May 5, and May 14.

The second set of plots for powder mildew control were conducted in the same commercial field adjacent to the first set of plots. Fungicide applied May 22 were Tilt at 4 fl oz/a, Stratego (combination of Flint and Tilt) at 10 fl oz/a, Folicur at 4 fl oz/a, Quadris at 12 fl oz/a, Flint (experimental) at 2.75 oz/a and BAS 500 00 F (experimental) at 9 fl oz/a. Plots were evaluated before treatment May 21 and after treatments on June 11, June 17, and June 25.

Fungicide evaluations for stripe rust were conducted in a `Sodnet' Kentucky bluegrass field at the Central Oregon Agricultural Research Center, Madras location. Fungicides were applied on May 28. Treatments were the same as the second powdery mildew trial. Plots were evaluated before treatment May 28 and after treatments on June 9, June 16, and June 25.

Results and Discussion

The effect of fungicides on the level of powdery mildew varied between the early trial (Table 1) and the later trial (Table 2). In the first trial Tilt in combination with Microthiol provided the best control, followed by Tilt alone, Bayleton, Microthiol, and Folicur. Quadris did not reduce powdery mildew at either rate.

In the second powdery mildew trial the best control was provided by Rally, followed by Flint from Norvartis. Treatments of the other fungicides including Stratego (a combination Flint and Tilt) did not significantly reduce the level of disease compared to the untreated plots. At the time of the second trial, disease levels were quite advanced and plant growth was substantial, making good fungicide coverage more difficult.

The effect of fungicides on the level of stripe rust is provided in Table 3. Stripe rust was significantly reduced by the numbered compound BAS 500 00F, Stratego, Tilt, and Flint. Fungicides were applied when disease levels were already high, rather than as a preventive treatment.

Table 1. Severity of powdery mildew on Kentucky bluegrass near Madras, Oregon following fungicide application April 17, 1998.

Treatments[2]		Powdery Mildew'					
	Rate	Pre-trt	Post-trt		Post-trt		Post-trt
	product/a	4-16	4-28		5-5		5-14
Tilt	4 oz	2.9	1.3	c[3]	0.8	cd	1.1 b
Tilt + Microthiol	4 oz 2 lb	2.6	1.6	c	0.6	d	0.7 c
Folicur	4 oz	2.6	1.7	bc	1.3	bc	1.4 b
Bayleton	4 oz	2.3	1.3	c	0.7	d	1.2 b
Quadris	6 oz	2.6	2.4	ab	2.6	a	2.6 a
Quadris	12 oz	2.7	2.3	ab	2.4	a	2.4 a
Microthiol	5 lb	2.7	1.8	bc	1.6	b	1.3 b
Untreated		2.6	2.8	a	2.8	a	2.5 a
		NS					

'Rating scale was 0-5, with 0 = no mildew and 5 = the leaves completely covered.
[2]Treatments applied with 1 qt/100 gal Silwet.
[3]Mean separation with Student-Newman-Keuls Test at P<0.05.

Table 2. Severity of powdery mildew on Kentucky bluegrass near Madras, Oregon following fungicide application May 22, 1998.

Treatments[2]		Powdery Mildew'					
	Rate	Pre-trt	Post-trt		Post-trt		Post-trt
	product/a	5-21	6-11		6-17		6-25
Tilt	4 oz	2.5	2.4		1.9	ab[3]	2.3 ab
Stratego	10 oz	2.2	2.2		2.4	a	2.2 ab
Flint	2.75 oz	2.3	2.5		2.5	a	2 b
Folicur	4 oz	2.2	2.1		2.5	a	2.1 ab
Quadris	12 oz	2.3	2.6		2.5	a	2.4 ab
BAS 500 OOF	9 oz	2.4	2.6		2.5	a	2.5 a
Rally	6 oz	2.2	2.2		1.7	b	1.6 c
Untreated		2.2	2.5		2.5	a	2.5 a
		NS	NS				

'Rating scale was 0-5, with 0 = no mildew and 5 = the leaves completely covered.
[2]Treatments applied with 1 qt/100 gal Silwet.
[3]Mean separation with Student-Newman-Keuls Test at P<0.05.

Table 3. Severity of stripe rust on Kentucky bluegrass near Madras, Oregon following fungicide application May 28, 1998.

Treatments'	Rate	Stripe Rust'			
		Pre-trt	Post-trt	Post-trt	Post-trt
	product/a	5-28	6-9	6-16	6-25
Tilt	4 oz	2.6 ab[3]	2.7	2.4	1.7 be
Stratego	10 oz	3.2 a	3.0	2.2	1.5 c
Flint	2.75 oz	2.8 ab	3.0	2.5	1.7 be
Folicur	4 oz	2.9 ab	3.0	2.7	2.1 ab
Quadris	12 oz	2.6 ab	2.9	2.5	1.8 abc
BAS 500 OOF	9 oz	3.0 ab	3.0	2.4	1.5 c
Rally	6 oz	2.9 ab	3.2	2.5	2.1 ab
Untreated		2.5 b	3.2	2.7	2.3 a
			NS	NS	

'Rating scale was 0-5, with 0 = no rust and 5 = the leaves completely covered.
'Treatments applied with 1 qt/100 gal Silwet.
[3]Mean separation with Student-Newman-Keuls Test at P<0.05.