

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

*M.D. Butler, N.A. Farris and R.J. Burr*

Kentucky bluegrass 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 has 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 appears earlier in the spring when temperatures are between 60 and 70°F under humid conditions. The appearance of stripe rust (*Puccinia striiformis*) usually follows powdery mildew during late spring when temperatures have increased and free moisture is available.

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

Plots 10 ft x 22 ft were replicated four times in a randomized complete block design. Treatments were applied with a CO<sub>2</sub>-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 at 4 fl oz/a, Tilt at 4 fl oz/a plus Microthiol at 2 lb/a, Folicur at 4 fl oz/a, Bayleton at 4 fl oz/a, Quadris 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 prior to treatment April 16, and following treatment 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 at 10 fl oz/a, Folicur at 4 fl oz/a, Quadris at 12 fl oz/a, Flint at 2.75 oz/a and BAS 500 00 F at 9 fl oz/a. Plots were evaluated prior to treatment May 21, and following treatment 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 prior to treatment May 28 and following treatment on June 9, June 16, and June 25.

The effect of fungicides on the level of powdery mildew is provided in Table 1 for the early trial, and Table 2 for the later trial. 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. Treatments of the other fungicides including Stratego, 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 00 F, Stratego, Tilt, and Flint. Fungicides were applied when disease levels were already quite 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 using a rating scale of 0 (no disease) to 5 (leaves totally covered).

Treatments <sup>2</sup>	Rate (product/a)	Powdery mildew severity			
		Pre-treat. 4/16/98	Post-treat. 4/28/98	Post-treat. 5/5/98	Post-treat. 5/14/98
		----- (0-5) <sup>1</sup> -----			
Tilt	4 oz	2.9	1.3 c <sup>3</sup>	0.8 cd	1.1 b
Tilt	4 oz				
+ Microthiol	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			

<sup>1</sup>Rating scale was 0-5, with 0 = no mildew and 5 = the leaves completely covered.

<sup>2</sup>Treatments applied with 1 qt/100 gal Silwet.

<sup>3</sup>Mean separation with Student-Newman-Keuls Test at  $P \leq 0.05$ .

Table 2. Severity of powdery mildew on Kentucky bluegrass near Madras, Oregon following fungicide application May 22, 1998 using a rating scale of 0 (no disease) to 5 (leaves totally covered).

Treatments <sup>2</sup>	Rate (product/a)	Powdery mildew severity			
		Pre-treat. 5/21/98	Post-treat. 6/11/98	Post-treat. 6/17/98	Post-treat. 6/25/98
		----- (0-5) <sup>1</sup> -----			
Tilt	4 oz	2.5	2.4	1.9 ab <sup>3</sup>	2.3 ab
Flint	10 oz	2.2	2.2	2.4 a	2.2 ab
CGA-279202	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 00F	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	

<sup>1</sup>Rating scale was 0-5, with 0 = no mildew and 5 = the leaves completely covered.

<sup>2</sup>Treatments applied with 1 qt/100 gal Silwet.

<sup>3</sup>Mean separation with Student-Newman-Keuls Test at  $P \leq 0.05$ .

Table 3. Severity of stripe rust on Kentucky bluegrass near Madras, Oregon following fungicide application May 28, 1998 using a rating scale of 0 (no disease) to 5 (leaves totally covered).

Treatments <sup>2</sup>	Rate (product/a)	Stripe rust severity			
		Pre-treat. 5/28/98	Post-treat. 6/9/98	Post-treat. 6/16/98	Post-treat. 6/25/98
		----- (0-5) <sup>1</sup> -----			
Tilt	4 oz	2.6 ab	2.7	2.4	1.7 bc
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 bc
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 00F	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		

<sup>1</sup>Rating scale was 0-5, with 0 = no rust and 5 = the leaves completely covered.

<sup>2</sup>Treatments applied with 1 qt/100 gal Silwet.

<sup>3</sup>Mean separation with Student-Newman-Keuls Test at  $P \leq 0.05$ .