Fungicide Evaluation for Powdery Mildew Control in Kentucky Bluegrass

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Introduction

Powdery mildew on Kentucky bluegrass (*Poa pratensis*) is caused by the fungus *Erysiphe graminis*. This disease is prevalent in central Oregon during the spring when conditions are cool and somewhat cloudy. Numerous fungicides are available to effectively control powdery mildew on Kentucky bluegrass. A new fungicide called Absolute™ (tebuconazole + trifloxystrobin) has recently been registered for use on grasses. Myclobutanil has been a commonly used fungicide that recently underwent a formulation change from an emulsifiable concentrate (Laredo®) to a wettable powder (Rally®). The objective of this research was to evaluate the efficacy of fungicides on powdery mildew in Kentucky bluegrass, given some of these changes.

Methods and Materials

A single field trial was conducted in a third-year stand of 'Geronimo' Kentucky bluegrass near Culver, Oregon. The trial consisted of nine fungicide treatments and a check, which were applied on April 30, 2009. Plots were 8 ft by 30 ft with 4 replications arranged as randomized complete blocks. Treatments were applied with a CO_2 backpack sprayer delivering 20 gal/acre operating at 40 psi and 3 mph. Powdery mildew infection was determined by making 10 visual ratings per plot on a scale of 0 to 5. The scale for powdery mildew infection was defined as follows: 0 = no disease present, 1 = 1 to 10 percent infection, 2 = 11 to 30 percent infection, 3 = 31 to 70 percent infection, 4 = 71 to 90 percent infection, and 5 = 91 to 100 percent infection. Ratings were made on May 11 (11 days after treatment [DAT]), May 27 (27 DAT), and June 8 (39 DAT). Based on these evaluations a calculation of the area under the disease progress curve (AUDPC) was also made.

Results and Discussion

At the time of application some powdery mildew was already developing. Also, powdery mildew infection was not uniform throughout the trial. Two of the four replications had a very minor infection of powdery mildew, which kept the means low and resulted in high coefficients of variation (CV) (Table 1). The development of powdery mildew was almost exactly to the line between the replications.

Calculation of AUDPC is a way to summarize disease intensity over time. Based on AUDPC, Absolute and Quilt® controlled most of the powdery mildew compared to the check. Higher rates of Absolute and/or adding Tilt® did not increase control of powdery mildew. Headline® did not work well, probably because the infection was already underway at the time of application.

The use of different adjuvants with different treatments may have been a confounding factor in this trial. Different adjuvants were used because the Absolute label recommends methylated seed

oil (MSO) for use on grasses. However, the Rally, Laredo, Quilt, and Headline labels have little to no recommendation for adjuvants. It was not clear if adding MSO to these fungicides would result in crop injury, therefore these treatments were instead applied with a non-ionic surfactant. In hind sight, using MSO for all the treatments would have made the interpretation of these data more clear.

Surprisingly the new formulation of myclobutanil, Rally, did not control powdery mildew as well as the old formulation, Laredo. It may be that the Laredo formulation, being an emulsifiable concentrate, was more effective because of the oily consistency. However, the Rally that was used was not new and may have been in storage for at least 10 years, so the efficacy may not be representative.

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Table 1. Powdery mildew evaluations following fungicide applications to Kentucky bluegrass near Culver, Oregon, 2009.

Treatment[1]	Product	Rate	May 11	May 27	June 8	AUDPC
		(lb ai/acre)	---------- 0-5 rating ----------			
Check	---	---	0.5	0.7	1.3	21.0
Myclobutanil[2]	Laredo 2 EC	0.125	0.3	0.2	0.6	8.1
Myclobutanil[2]	Rally 40 WP	0.125	0.6	0.4	0.8	15.2
Propiconazole + azoxystrobin[2]	Quilt 1.66 EC	0.182	0.3	0.1	0.1	4.1
Pyraclostrobin[2]	Headline 2.09 EC	0.098	0.4	0.3	0.9	12.9
Tebuconazole + trifloxystrobin[3]	Absolute 4.36 SC	0.17	0.1	0.1	0.1	2.1
Tebuconazole + trifloxystrobin[3]	Absolute 4.36 SC	0.26	0.4	0.0	0.0	3.0
Tebuconazole + trifloxystrobin Propiconazole[3]	Absolute 4.36 SC Tilt 3.6 EC	0.17 0.17	0.3	0.1	0.1	3.4
Tebuconazole + trifloxystrobin Propiconazole[3]	Absolute 4.36 SC Tilt 3.6 EC	0.26 0.17	0.1	0.0	0.2	2.4
USF2016A[2]	N/A	0.156	0.2	0.0	0.4	4.1
LSD (P = 0.05)	---	---	NS	0.36	0.71	10.57
CV	---	---	86.15	135.87	111.29	95.88
p value	---	---	0.26	>0.01	0.01	>0.01

[1]Applied April 30, 2009 when Kentucky bluegrass was 2 to 6 inches tall.
[2]Applied with non-ionic surfactant at 0.25% v/v.
[3]Applied with methylated seed oil at 1.0% v/v.