

RUST CONTROL IN PERENNIAL RYEGRASS GROWN FOR SEED

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Rust is the most serious fungal disease affecting perennial ryegrass seed fields in western Oregon. Left untreated, seed yield losses of over 60% have been reported. An estimated 95% of the acres get 1 to 4 fungicide applications each year to prevent or control stem rust. Perennial ryegrass seed growers have relied heavily on essentially one fungicide (Tilt) for controlling rust infestations for nearly 20 years.

During 1993, in response to concerns about potential development of rust resistance to a single type of fungicide, field trials to evaluate other products were established. These trials included various sulfur products and other additives applied alone and in tank mixes with Tilt to evaluate their effectiveness against rust. These materials were selected because it was believed they had some rust suppression activity and could be readily labeled for use on grass seed crops. After two years research Sulforix and Thiolux were registered for use in combination with Tilt for rust control.

By 1996 work with these products was discontinued and other, new fungicides were being tested in several on-farm rust control trials. This report covers the results of field trials conducted in 1997 and 1998. The three fungicides evaluated in 1997 were Tilt, Folicur and Quadris. Tilt, the standard fungicide in most rust control programs and Folicur are sterol inhibitor fungicides. Quadris, a strobilurin fungicide, has a completely different chemistry and mode of action.

At each trial, plots were replicated three times. Initial applications were made just prior to or at the very first visible appearance of any rust development in the field. The first fungicide applications were made about May 20 with succeeding treatments being applied at approximately 21-day intervals. A non-ionic surfactant was added to all fungicide treatments at a rate of 0.25% by spray volume. Fungicides were applied in twenty gallons of water per acre.

Replicated, small plots were established in 1997 on three production fields of perennial ryegrass to evaluate the effectiveness of the three fungicides for rust control. Two trials were located east of Salem and one southwest of Albany. Rust severity often varies widely from one year to the next and from one field to another in any particular year. In fields where trials were located in 1997 rust severity in untreated checks were rated from light to moderate at the time of the final fungicide application. Treatments included multiple, single and sequential applications. Under moder-

ate rust pressure conditions all three fungicides (Tilt, Folicur and Quadris) provided adequate stem rust control through the end of the season (Fig. 1).

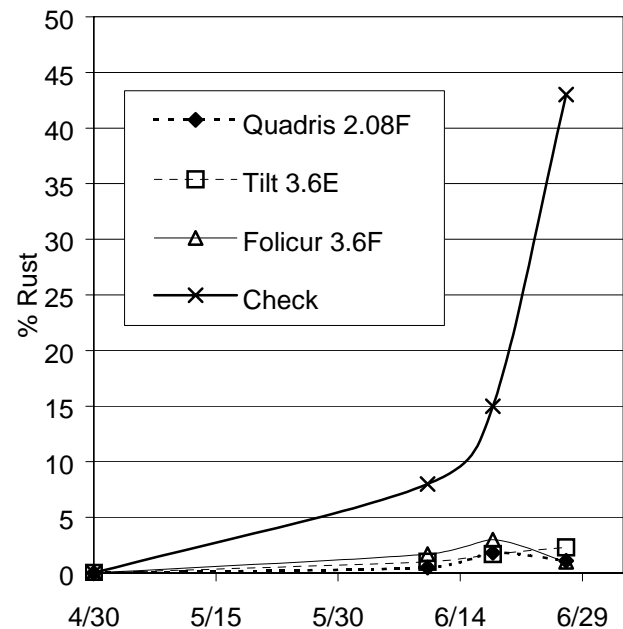


Figure 1. Stem rust development on Affinity perennial ryegrass during a year of moderate disease pressure, 1997.

Visual evaluations of each treatment were made 2 to 3 times between the initial fungicide treatment and just prior to swathing. Control ratings are listed as a percentage of rust infection for each treatment (Table 1). Tilt and Folicur consistently provided adequate and similar control of rust. Quadris provided equal or slightly superior control at each location. The treatments using the fungicide rotation sequences provided equal control to the treatments using a single fungicide under moderate rust pressure in 1997.

On-farm trials using Tilt, Folicur and Quadris were again conducted at three locations in 1998. In addition, several fungicides not previously tested in our trials were included. The fungicides added included Systhane, Dithane and a numbered, experimental fungicide manufactured by Novartis, CGA6425 + CGA279202. Both Folicur and Quadris received Oregon Sec. 24c registrations for rust control in grass grown for seed and were used commercially in rust control programs during the spring rust season.

Of the on-farm sites used in 1998, one was located east of Salem and two in the south valley, one at Junction City and the other near Harrisburg. In general, rust infection levels in most fields were significantly higher than was observed in 1997. At two of the sites rust levels were rated as severe but only moderate at the Harrisburg location. As in the previous year Quadris, Tilt and Folicur provided acceptable control in most treatments. These and other fungicide trials

have shown that Quadris has consistently provided slightly superior rust control late in the season and in situations where rust pressure is very high (Fig. 2).

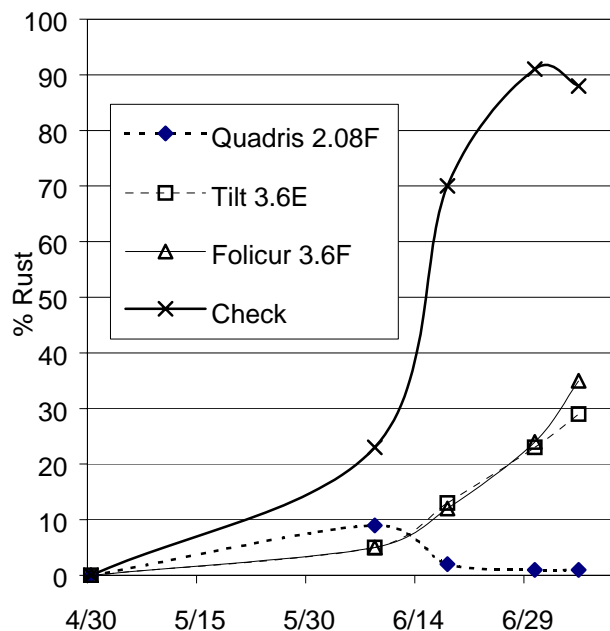


Figure 2. Stem rust development on Affinity perennial ryegrass during a year of severe stem rust pressure, 1998.

The spray program used at all sites in 1998 used three fungicide applications to provide adequate rust control. Where rust pressure was severe, treatments that included a Quadris application again provided equal or superior rust control to any other fungicide application.

The level of control from the different treatments varied between sites depending on the level of rust infection (Table 2). In general the new fungicide products added in 1998, provided equal control to Tilt and Folicur but were not as good as the best Quadris treatments under heavy rust conditions. The first early treatment using Tilt plus Bravo followed with three applications of Tilt was not any more effective than the best three application treatments with Quadris.

Based on the results of these trials and the apparent interest of major chemical manufacturers the Oregon grass seed industry should have additional, effective fungicides available for disease control for the foreseeable future.

Appreciation is expressed to the Bayer Corp., Novartis Inc., Rohm & Haas Co., and ZEZECA Inc., for their support of these projects.

Table 1. Visual ratings of rust infection levels in three perennial ryegrass varieties at end of season, July, 1997.

Treatment	Rate (product/a)	Variety		
		Dasher 2 July 2	JB3 July 9	Affinity July 3
		----- (% rust infection) -----		
Quadris(3x)	9 oz.	1	1	0
Tilt(3x)	6 oz.	12	1	2
Folicur(3x)	6 oz.	2	1	1
Tilt/Quadris/Tilt	6/9/6 oz.	1	1	1
Folicur/Quadris/Folicur	6/9/6 oz.	4	1	0
Check	0	67	27	41
LSD 0.05		20	4	31

Table 2. Visual ratings of rust infection levels in three perennial ryegrass varieties at end of season, July 6, 1998.

Treatment	Rate (product/a)	Variety		
		Top Hat June 29	Elf July 6	Affinity July 6
		----- (% rust infection) -----		
Tilt + Bravo(1x)/ Tilt(3x)	6 oz. + 1.5pt/6oz.	7	1	14
Quadris(3x)	6 oz.	3	2	4
Quadris(3x)	9 oz.	0	1	1
Tilt(3x)	6 oz.	14	3	29
Folicur(3x)	6 oz.	17	3	35
CGA6425 + CGA279202(3x)	10 oz.	9	3	10
Systhane + Dithane(3x)	10 oz. + 32 oz.	11	3	28
Tilt/Quadris/Folicur	6/9/6 oz.	6	2	8
Quadris/Tilt/Quadris	9/6/9 oz.	2	0	4
Check	0	97	70	88
LSD 0.05		13	12	8