WHEAT (*Triticum aestivum* 'Fielder', 'Eden')
Stripe rust; *Puccinia striiformis* f. sp. *tritici*

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Control of stripe rust of spring wheat with foliar fungicides, 2005.

The study was conducted in a field with Palous silt loam under natural infection of stripe rust near Pullman, WA. Urea (46-0-0) was applied at 60 lb/A at the time of cultivation. Susceptible 'Fielder' and moderately susceptible 'Eden' were seeded at 60 lb/A in rows 12 in. apart with an experimental drill planter on 19 Apr 05. Harmony Extra 0.33 oz plus Buctril 0.75 pt/A with Agridex at 1% of spray volume was applied on 27 May at tillering stage. Fungicides were applied in 16 gal water/A on 20 Jun at late jointing stage when Fielder had 20-50% of stripe rust severity. Sprays were applied in the early morning when wind was about 0.2 mph and temperatures were between 70.2°F and 73.3°F. A 601C backpack sprayer from R & D Sprayers Inc. was used with a C3470 regulator and a 2.5 lb CO_2 cylinder. The spray boom had four nozzles 19 in. apart, but three were used because of the width of the plots. The spray pressure was 18 psi. In the treatment with two sprays of Quilt plus COC, the first spray was applied on 20 Jun at late jointing and a second spray was applied on 6 Jul at early flowering. A randomized block design was used with four replications for each treatment. Stripe rust severity (percent of diseased foliage) was assessed on 22 Jun or 2 days after fungicide application at late jointing stage; 28 Jun or 8 days after application at boot stage; 7 Jul or 17 days after application at flowering stage; and 15 Jul or 25 days after fungicide application at milk stage. Plots were individually measured at the time of harvest and plot area ranged from 56.4 to 63.4 sq ft. Plots were harvested on 26 Aug when kernels were naturally dry, and test weight of kernels was measured for each plot. Area under disease progress curve (AUDPC) was calculated for each treatment using the four sets of severity data. Relative AUDPC was calculated as percent of the non-treated control. Rust severity, relative AUDPC, test weight, and yield data were subjected to analysis of variance and means were separated by Fisher's protected LSD test.

Stripe rust severity in non-treated control plots was 32.5, 62.5, 90, and 100% on 22 Jun, 28 Jun, 7 Jul, and 15 Jul on susceptible Fielder, and 27.5, 55, 50, and 65% on moderately susceptible Eden, respectively. All treatments significantly reduced stripe rust severity at 8, 17, and 25 days after application. Disease control remained effective 25 days after application on Eden, while significant stripe rust (10 - 62.5% of severity) developed in the plots of Fielder treated with Headline, Stratego, Quilt (14 fl oz), Tilt, Flutriafol, and Quadris. All treatments increased test weight. However, only increases by Sparta, Quilt, Absolute, and Folicur were significant. All fungicide treatments significantly increased yield of both Fielder and Eden compared to the non-treated control. The yield increases by fungicide applications ranged from 69 to 164% for Fielder and from 17 to 29% for Eden.

Cultivar, treatment, rate/A, and timing of application[z]	Stripe rust severity (%)[y]					Test weight	Yield[w]	
	22 Jun Late jointing	28 Jun Early boot	7 Jul Headed	15 Jul Milk	Relative AUDPC[x]	(lb/bu)	Mean (bu/A)	Increase (%)
Fielder								
Sparta 4 fl oz (late jointing-20 Jun) ……..	30.00	2.50	0.00	0.00	6.28	57.59	48.63	164
Quilt 7 fl oz (late jointing-20 Jun) + Quilt 14 fl oz (headed-6 Jul) ……..	32.50	0.00	1.50	0.25	6.43	56.95	44.69	143
Absolute 5 fl oz (late jointing-20 Jun) ……..	27.50	0.00	0.00	0.00	4.77	56.71	43.14	134
Quilt 14 fl oz (late jointing-20 Jun) ……..	32.50	0.00	0.75	25.00	11.78	56.74	40.23	119
Folicur 6 fl oz (late jointing-21 May) ……..	27.50	0.25	0.00	0.25	4.93	56.60	39.90	117
Stratego 10 fl oz (late jointing-20 Jun) ……....	27.50	0.25	0.75	35.00	13.33	55.47	38.40	109
Tilt 4 fl oz (late jointing-20 Jun) ……..	25.00	1.50	3.00	22.50	11.65	54.80	35.79	94
Flutriafol 14 fl oz (late jointing-20 Jun) ……..	32.50	1.25	0.25	13.75	9.48	55.68	35.21	91
Headline 6 fl oz (late jointing-20 Jun) ……..	42.50	7.50	15.00	62.50	32.42	55.58	32.13	75
Quadris 6 fl oz (late jointing-20 Jun) ……..	30.00	1.25	15.00	10.00	15.52	55.19	31.03	69
Non-treated control ……..	32.50	62.50	90.00	100.00	100	52.93	18.41	
LSD ($P \leq 0.05$) ……..	13.09	6.24	9.29	8.68	7.48	3.05	12.36	
Eden								
Quilt 14 fl oz (late jointing-20 Jun) …….....	35.00	0.00	0.00	0.00	8.90	60.41	70.80	29
Stratego 10 fl oz (late jointing-20 Jun) …….	27.50	0.00	0.00	0.00	6.99	59.91	70.81	29
Quilt 7 fl oz (late jointing-20 Jun) + Quilt 14 fl oz (heading-6 Jul) …….	30.00	0.00	0.00	0.00	7.63	60.41	69.87	28
Sparta 4 fl oz (late jointing-20 Jun) …….....	27.50	2.75	0.00	0.00	8.74	59.98	69.35	27
Absolute 5 fl oz (late jointing-20 Jun) …….....	30.00	6.50	0.00	0.00	11.76	59.53	68.89	26
Headline 6 fl oz (late jointing-20 Jun) …….	32.50	0.50	0.00	0.00	8.58	60.06	68.48	25
Tilt 4 fl oz (late jointing-20 Jun) ……..	27.50	0.00	0.00	0.00	6.99	60.19	68.10	24
Flutriafol 14 fl oz (late jointing-20 Jun) ……..	27.50	8.75	0.00	0.00	12.55	60.20	67.37	23
Quadris 6 fl oz (late jointing-20 Jun) ……..	27.50	0.25	0.00	0.00	7.15	60.41	66.27	21
Folicur 6 fl oz (late jointing-21 May) ……..	30.00	1.75	0.00	0.00	8.74	60.65	64.26	17
Non-treated control ……..	27.50	55.00	50.00	65.00	100.00	58.89	54.74	
LSD ($P \leq 0.05$) ……..	9.26	6.04	13.68	11.15	13.21	0.81	8.04	

[z] Crop Oil Concentrate (COC) at 1% v/v was applied in the treatments with Quilt, Tilt, Quadris, or Headline.

[y] Stripe rust severity was recorded as percentage of leaf area with disease.

[x] AUDPC is area under disease progress curve, = ∑[rust severity (i) + rust severity (i+1)]/2*days. Relative AUDPC was calculated for each treatment as the percent of the AUDPC (as 100%) of the non-treated control.

[w] Yield (lb/A) based on 3-5% moisture and test weight (lb/bu) measured for each plot.