

Control of stripe rust of spring barley 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 'Russell' and 'Morex' 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 21 Jun at late jointing stage when Russell had 5-10% and Morex had 1-5% 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 CO₂ 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 21 Jun at late jointing stage and a second spray was applied on 6 Jul at early flowering stage. 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 1 day 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 7.5, 35, 70, and 90% on 22 Jun, 28 Jun, 7 Jul, and 15 Jul, respectively on Russell, and 1.5, 2.75, 25, and 35% on Morex, respectively. All treatments significantly reduced stripe rust severity at 8, 17, and 25 days after application. Significant stripe rust (29.6% on Russell and 15% on Morex) developed in the plots treated with Flutriafol at 25 days after application, whereas other treatments maintained effective disease control. All treatments significantly increased test weight of Russell, but not Morex. Yield of Russell was increased by 16 to 36% and was significant for all treatments except Stratego. Yield of Morex was increased by 3 to 14%, but none were significantly greater than the non-treated control. The lack of significant increases of yield in Morex was likely due to reduced levels of stripe rust compared to levels in Russell.

Cultivar, treatment, rate/A, and timing of application ^z	Stripe rust severity (%) ^y				Relative AUDPC ^x	Test weight (lb/bu)	Yield ^w	
	22 Jun Late jointing	28 Jun Early boot	7 Jul Headed	15 Jul Milk			Mean (lb/A)	Increase (%)
Russell								
Sparta 4 fl oz (late jointing-20 Jun)	8.75	0.50	0.00	0.00	2.75	50.12	4751.7	36.46
Quilt 14 fl oz (late jointing-20 Jun)	10.00	0.50	0.25	0.50	3.47	48.70	4643.7	33.36
Folicur 6 fl oz (late jointing-21 May)	7.50	0.50	0.50	0.25	2.88	50.29	4635.9	33.14
Quadris 6 fl oz (late jointing-20 Jun)	10.00	0.25	0.00	0.00	2.92	50.79	4622.0	32.74
Absolute 5 fl oz (late jointing-20 Jun)	8.75	0.25	0.25	0.00	2.77	49.87	4386.7	25.98
Quilt 7 fl oz (late jointing-20 Jun)								
+ Quilt 14 fl oz (headed-6 Jul).....	8.75	0.25	0.00	0.00	2.58	49.87	4177.3	19.97
Headline 6 fl oz (late jointing-20 Jun)	8.75	0.50	0.50	0.25	3.23	50.22	4174.9	19.90
Tilt 4 fl oz (late jointing-20 Jun)	10.00	0.25	1.75	0.50	4.47	49.94	4156.2	19.36
Flutriafol 14 fl oz (late jointing-20 Jun)	10.00	0.75	15.00	40.00	29.60	48.84	4087.8	17.40
Stratego 10 fl oz (late jointing-20 Jun)	7.50	0.25	1.75	0.50	3.78	50.40	4052.4	16.38
Non-treated control	7.50	35.00	70.00	90.00	100.00	47.26	3482.0	
LSD ($P \leq 0.05$)	3.16	16.60	9.58	7.09	10.25	1.55	594.6	
Morex								
Absolute 5 fl oz (late jointing-20 Jun)	1.75	0.25	0.00	0.00	1.89	49.30	3396.7	14.31
Quadris 6 fl oz (late jointing-20 Jun)	1.50	0.00	0.00	0.00	1.19	49.73	3327.0	11.96
Quilt 14 fl oz (late jointing-20 Jun)	1.00	0.00	0.00	0.00	0.79	48.60	3297.6	10.97
Stratego 10 fl oz (late jointing-20 Jun)	1.75	0.00	0.00	0.00	1.39	48.57	3293.7	10.84
Tilt 4 fl oz (late jointing-20 Jun)	2.25	0.25	0.00	0.00	2.28	49.20	3279.9	10.38
Headline 6 fl oz (late jointing-20 Jun)	1.50	0.00	0.00	0.25	1.46	49.13	3237.6	8.96
Flutriafol 14 fl oz (late jointing-20 Jun)	1.75	0.00	2.50	7.50	14.97	49.16	3237.6	8.96
Folicur 6 fl oz (late jointing-21 May)	1.00	0.00	0.00	0.00	0.79	49.23	3202.8	7.78
Sparta 4 fl oz (late jointing-20 Jun)	1.75	0.25	0.00	0.00	1.89	48.60	3098.4	4.27
Quilt 7 fl oz (late jointing-20 Jun)								
+ Quilt 14 fl oz (heading-6 Jul)	1.25	0.00	0.00	0.00	0.99	49.94	3074.0	3.45
Non-treated control	1.50	2.75	25.00	35.00	100.00	49.20	2971.5	
LSD ($P \leq 0.05$)	1.02	3.02	3.38	4.78	10.50	1.72	549.5	

^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, = $\sum[\text{rust severity (i)} + \text{rust severity (i+1)}]/2 \times \text{days}$. 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.