

Evaluation of chemical seed treatments for control of stripe rust in spring wheat, 2012.

The study was conducted in a field with Palouse silt loam near Pullman, WA. Fertilizer (Osmocota 14-14-14) was applied at 60 lb/A at the time of cultivation on 8 May 12. A randomized block design was used with four replications for each of the seven treatments and a non-treated control. For each plot, seed of susceptible 'Lemhi' spring wheat were planted in rows spaced 14-in. apart at 60 lb/A with a drill planter on 8 May 12. Each plot was 4.4-ft (4 rows) in width and 15.5 - 16.6-ft in length, with spaces of 20 in. between plots. Huskie 15 fl oz plus Axial 80 ml and M-90 140 ml/A were applied on 4 Jun 12 when wheat plants were at early jointing stage. Plant stand was estimated as percentage for each plot at the early tillering stage. Disease severity (percentage of diseased foliage on whole plot) was assessed for each plot on 8 Jun (jointing stage), 10 Jul (flowering), 17 Jul (milk), and 24 Jul (soft dough). Plots were harvested on 15 Sep when kernels had 3-5% kernel moisture, and test weight of kernels was measured. Area under disease progress curve (AUDPC) was calculated for each plot using the five 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. The weather conditions during the crop season allowed a moderate level of stripe rust epidemic.

There were no significant differences in plant stand, indicating that the seed treatment chemicals did not have obvious phytotoxicity. On 8 Jun at flag leaf stage, stripe rust severity was scored as 2-3% rust severity. At 10 Jul (flowering stage), plants of non-treated control had 30-50% rust severity. At 17 Jul (milk) and 24 Jul (soft dough), stripe rust developed to 80-90% and 90-100% severity, respectively. There were some differences in rust severity and relative AUDPC among the treatments, but most treated plots were not significantly different from the non-treated control. None of the treatments significant reduced rust severity and relative AUDPC, but two treatments [Difenocon 18 gai + Iaconazole 1.5 and Dividend Extreme (185 ml/100kg)] had significantly higher rust severity or relative AUDPC than the non-treated control. Similarly, none of the treatments significantly increased grain test weight, but seven of them [Nipsit Inside Insect 5.00 FS 1.000 fl oz/cwt, Rancona pinnacle (325 ml/100kg), Rancona pinnacle (540 ml/100kg), Rancona 3.8 fs (3.4 ml/100kg) + Dividend Extreme (185 ml/100kg), Dividend Extreme (185 ml/100kg), UBI 9292 (325 ml/100kg), and UBI 9349 (65 ml/100kg)] actually reduced test weight significantly compared to the non-treated control. No significant difference was observed among the treatments and non-treated control. The results showed that the tested chemicals did not have any positive effect on control of stripe rust and grain yield under the field disease conditions.

Product and rate/A	Stripe rust severity (%) ^z				Relative AUDPC ^x	Test weight ^y (lb/bu)	Yield ^y	
	8 Jun Jointing	10 Jul Flower.	17 Jul Milk	24 Jul Dough			Mean (bu/A)	Increase (%)
Non-treated control	2.0 b ^w	40.0 cd	82.5 bc	95.0 ab	100.0 cd	57.4 a	26.5 a	0.0
Nipsit Inside Insect 5.00 FS 1.000 fl oz/cwt.....	2.0 b	40.0 cd	85.0 a-c	97.5 ab	102.0 cd	56.5 cd	24.7 a	-6.8
Metlock 3.70FS 0.052 fl oz/cwt + V10209 2.65FS 0.150 fl oz/cwt + Nipsit Inside Insect 5.00FS 1.000 fl oz/cwt (Metconazole 1.5)	2.0 b	45.0 a-d	85.0 a-c	97.5 ab	105.5 a-c	57.0 a-d	26.6 a	0.4
Metlock 3.70FS 0.090 floz/cwt + V10209 2.65FS 0.150 fl oz/cwt + Nipsit Inside Insect 5.00FS 1.000 fl oz/cwt (Metconazole 2.5).....	2.0 b	42.5 b-d	85.0 a-c	92.5 b	102.3 cd	56.8 a-d	25.2 a	-4.9
Dividend Extreme 0.96SS 3.000 fl oz/cwt + Nipsit Inside Insect 5.00FS 1.000 fl oz/cwt (Difenocon-18 gai).....	2.0 b	47.5 a-c	87.5 ab	92.5 b	107.8 a-c	56.8 a-d	26.6 a	0.4
Dividend Extreme 0.96SS 3.000 fl oz/cwt + Rancona 3.80FS 0.051 fl oz/cwt + Nipsit Inside Insect 5.00FS 1.000 fl oz/cwt (Difenocon 18 gai + Iaconazole 1.5)	2.0 b	55.0 a	90.0 a	95.0 ab	112.5 ab	57.3 ab	25.6 a	-3.4
Stamina F3 1.74FS 1.000 fl oz/cwt + Nipsit Inside Insect 5.00FS 1.000 fl oz/cwt	2.0 b	40.0 cd	87.5 ab	100.0 a	103.8 b-d	57.0 a-d	26.2 a	-1.1
Proceed Concentrate 1.03FS 1.000 fl oz/cwt + Nipsit Inside Insect 5.00FS 1.000 fl oz/cwt	2.0 b	45.0 a-d	87.5 ab	95.0 ab	106.3 a-c	56.8 a-d	26.8 a	1.1
Rancona pinnacle (325 ml/100 kg).....	2.0 b	40.0 cd	87.5 ab	97.5 ab	103.0 b-d	56.4 d	24.3 a	-8.3
Rancona pinnacle (433 ml/100 kg).....	2.0 b	42.5 b-d	87.5 ab	97.5 ab	104.5 bc	57.0 a-d	27.3 a	3.0
Rancona pinnacle (540 ml/100 kg).....	2.0 b	35.0 d	80.0 c	95.0 ab	94.3 d	56.6 cd	24.4 a	-7.9
Rancona 3.8 fs (3.4 ml/100 kg) + Dividend Extreme (185 ml/100 kg)....	2.0 b	42.5 b-d	87.5 ab	97.5 ab	104.8 bc	56.5 cd	25.3 a	-4.5

Dividend Extreme (185 ml/100 kg)....	2.0 b	52.5 ab	87.5 ab	100.0 a	112.5 ab	56.6 cd	25.2 a	-4.9
UBI 9292 (325 ml/100 kg).....	2.0 b	42.5 b-d	85.0 a-c	97.5 ab	103.0 b-d	56.4 d	26.3 a	-0.8
UBI 9349 (65 ml/100 kg).....	2.3 a	45.0 a-d	85.0 a-c	100.0 a	105.8 a-c	56.7 b-d	25.5 a	-3.8
LSD ($P \leq 0.05$)	0.2	10.4	7.0	6.7	9.9	0.6	4.1	

^z Stripe rust severity was recorded as percentage of whole plot leaf area with disease.

^y Test weight (lb/bu) and yield (lb/A) based on 3-5% kernel moisture.

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

^w Column numbers followed by the same letter are not significantly different at $P = 0.05$ as determined by LSD test.