

# EVALUATION OF FUNGICIDES FOR CONTROL OF LEAF RUST OF WINTER WHEAT IN KENTUCKY, 2012.

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WHEAT (*Triticum aestivum* 'Cumberland') Leaf rust; *Puccinia triticina*

The soft red winter wheat cultivar 'Cumberland' was planted with a no-till planter following corn harvest on 14 Oct 11 on the Kevil Tract of the University of Kentucky Research and Education Center in Princeton, KY. Wheat strips (4.3 ft-wide) were planted at a rate that would achieve a final stand of approximately 39 plants/ft<sup>2</sup> and consisted of seven rows on 7-in. spacing. Warrior insecticide was applied (3.5 fl oz/A) on 6 Nov 11 and again on 6 Mar 12 at crop green-up to reduce the potential for barley yellow dwarf. Liquid nitrogen (28-0-0) was applied in a split application at a rate of approximately 40 and 80 lb/A on 12 Feb and 21 Mar, respectively. Weeds were controlled by applying Harmony Extra herbicide (0.5 fl oz/A) on 26 Feb. On 6 Mar, wheat passes were subdivided into 20-ft plots by application of glyphosate herbicide. The experimental design was a randomized complete block with five replications. Fungicides applied at Feeke's (F) growth stage F6, 8, and/or 10-10.1 were made with a hand-held CO<sub>2</sub>-powered backpack boom sprayer equipped with two TeeJet 8002VS nozzles. Applications made at F10.51 were made using the same boom sprayer equipped with four TeeJet 8004VS nozzles in two dual-swivel nozzle bodies. Nozzles at each configuration were spaced at 19-in. apart and delivered approximately 20 gal/A of spray solution (40 psi). Treatments were applied on 20 Mar, 27 Mar, 3 Apr and 12 Apr corresponding to F6 (jointing), F8 (flag leaf just visible), F10-10.1 (boot to head visible), and F10.51 (beginning anthesis), respectively. Plots were rated for leaf rust at the late-milk to early dough stage (F11.1-2) on 7 May. Ratings were made by visually estimating the percentage leaf surface area diseased on the flag leaves of 10 arbitrarily-selected plants from the center four rows of each plot. Other foliar and head diseases in the

test were minimal. Plots were harvested on 30 May using a Wintersteiger small-plot combine. Yields were adjusted to 13.5% moisture at 60 lb/bu. Percentage data were arcsine-transformed prior to analysis using ANOVA and the Least Significant Difference test ( $P \leq 0.05$ ). Although statistics provided are based on transformed data, arithmetic means are presented in order to provide a better indication of the level of disease control provided by each treatment, as well as the overall disease pressure in the trial.

An extremely mild winter and early spring resulted in accelerated crop development. As a result, individual growth stages and harvest were about 15-20 days earlier than normal. An almost complete lack of rain and unseasonably warm temperatures in Apr and May limited the development of most foliar and head diseases with the exception of development of a moderate level of leaf rust. All treatments resulted in significantly less leaf rust compared to the non-treated control. However, significant ( $P \leq 0.05$ ) differences among treatments were evident. Generally, treatments involving application at the F10-10.1 or later performed significantly better than treatments applied at earlier growth stages. Sequential application of Approach 2.08 SC (6.0 fl oz/A) at Feeke's 6 and 8, Twinline 1.75 EC (9.0 fl oz/A) and Topguard 1.25 SC (14 fl oz/A) + Koverall 75% WP (2 lbs/A) applied at Feeke's 10-10.1, Prosaro 421 SC (6.0 fl oz/A) applied at either Feeke's 10-10.1 or at 10.51 and Caramba 0.75 SL (13.5 fl oz/A) applied at Feeke's 10.51 resulted in significantly higher yields compared to the control. No fungicide treatment resulted in a significantly higher test weights compared to the control. No phytotoxicity was noted in the test.

Treatment, rate/A	Feeke's stage applied <sup>z</sup>	Leaf rust <sup>y</sup> Flag (%)	Yield <sup>x</sup> (bu/A)	Test Weight (lbs/bu)
Non-treated.....	NA	23.6a <sup>w</sup>	70.7d	54.2ab
Headline 2.09 SC 3 fl oz <sup>v</sup> .....	6	12.9bc	71.5cd	54.7ab
Priaxor 4.17 SC 4 fl oz <sup>v</sup> .....	6	17.6b	72.7b-d	54.5ab
Twinline 1.75 EC6 fl oz <sup>v</sup> .....	6	15.1b	74.4a-d	54.4ab
Approach 2.08 SC 6 fl oz <sup>t</sup> fb <sup>u</sup> Approach 2.08 SC 6 fl oz <sup>t</sup> .....	6, 8	8.8c-e	82.7a	55.2a
Approach 2.08 SC 6 fl oz <sup>t</sup> .....	8	6.5d-f	72.7b-d	54.1ab
Approach 2.08 SC 9 fl oz <sup>t</sup> .....	8	6.0ef	75.5a-d	54.5ab
DPX-PZX74 SC 5 fl oz <sup>t</sup> .....	8	5.1f	77.6a-d	54.1ab
Headline 2.09 EC 6 fl oz <sup>v</sup> .....	8	10.3cd	73.4b-d	54.0b
Twinline 1.75 EC 9 fl oz <sup>v</sup> .....	10-10.1	0.1h	82.4a	54.2ab
Topguard 1.25 SC 10 fl oz....	10-10.1	4.9f	78.6a-d	54.8ab
Topguard 1.25 SC 10 fl oz + Koverall 75% WP 1.5 lb <sup>t</sup> .....	10-10.1	1.4g	73.7b-d	54.2ab
Topguard 1.25 SC 14 fl oz....	10-10.1	5.8ef	76.8a-d	54.4ab
Topguard 1.25 SC 14 fl oz + Koverall 75%WP 2 lb <sup>t</sup> .....	10-10.1	0.6gh	81.3ab	54.6ab
Prosaro 421 SC 6 fl oz <sup>v</sup> .....	10-10.1	0.1h	76.7a-d	54.3ab
Caramba 0.75 SL 13.5 fl oz..	10.51	0.2h	74.3a-d	54.0b
Prosaro 421 SC 6 fl oz <sup>v</sup> .....	10.51	0.0h	80.2a-c	54.1ab
<i>P</i> -value of F statistic		<.0001	0.0910	0.8423
CV (%)		26.1	8.7	1.7

Feeke's growth stage (F); Fungicide applications were made 20 Mar, 27 Mar, 3 Apr and/or 12 Apr corresponding to F6, 8, 10.0-10.1, and 10.51, respectively.

<sup>y</sup>Leaf rust, *P. tritici*, was visually estimated on flag leaves of 10 plants per plot at late-milk to-early dough stage (F11.1-2) on 7 May.

<sup>x</sup>Based on 13.5% moisture and 60 lb/bu.

<sup>w</sup>Column numbers followed by the same letter are not significantly different, Least Significant Difference test ( $P \leq 0.05$ ).

<sup>v</sup>Induce was added to treatments at 0.125% v/v.

<sup>u</sup>Fb = followed by.

<sup>t</sup>Induce was added to treatments at 0.25% v/v.