

EVALUATION OF TEBUZOL FUNGICIDE FOR CONTROL OF FUSARIUM HEAD BLIGHT AND DEOXYNIVALENOL, GLUME BLOTCH AND LEAF DISEASES IN A SOFT RED WINTER WHEAT CULTIVAR IN KENTUCKY, 2009

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The soft red winter wheat cultivar 'Cumberland' was planted with a no-till planter following corn harvest on 14 Oct 08 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 36 plants ft² and consisted of seven rows on 7-in spacing. Warrior insecticide was applied (3.5 fl oz/A) on 10 Nov 08 and again on 17 Mar 09 at crop green-up to reduce the potential for barley yellow dwarf. Liquid nitrogen (28-0-0) was applied in a February/March split application at a rate of approximately 40 and 80 lbs/A on 7 Feb 09 and 23 Mar 09, respectively. Weeds were controlled by applying Harmony Extra herbicide (0.5 fl oz/A) on 17 Mar 09. On 16 Apr 09, strip rows were subdivided into 20-ft plots by application of Round-up herbicide. The experiment design was a randomized complete block with five replications. Fungicide treatments were applied with a hand-held CO₂-powered backpack boom sprayer equipped with two Teejet 8002VS nozzles delivering approximately 20 gpa at 40 psi. Treatments were applied on 17 Mar and 2 May, corresponding to Feeke's (F) stages 4-5 and 10.51, respectively. Plots were rated for leaf blotch complex (primarily *S. nodorum*, but low levels of speckled leaf blotch (*Septoria tritici*) and tan spot (*Pyrenophora tritici-repentis*) were also

present) and leaf rust at the late-milk stage (F11.1) on 28 May 09. Foliar ratings were made by visually estimating the percent leaf surface area diseased for flag and flag-1 leaves of 10 arbitrarily-selected plants per plot. Fusarium head blight (FHB) and glume blotch assessments were made in the laboratory by visually estimating the severity of each disease on 100 heads arbitrarily-collected from plots on 27 May 09. Glume blotch severity was determined by visually estimating the percent surface area diseased per spike. FHB severity was calculated by counting the no. of infected spikelets/spike and dividing by the mean number of total spikelets of 10 arbitrarily-selected spikes (i.e. 100% of spike surface area) and multiplying by 100. Plots were harvested on 25 Jun 09 using a Wintersteiger small-plot combine. Yields were adjusted to 13.5% moisture and 60 lb/bu. A hand-cleaned, 25-g grain sample from each treatment plot was assessed for Fusarium damaged kernels (FDK) using an air separation technique and submitted to the University of Minnesota, St. Paul, MN for deoxynivalenol (DON) analysis. Percentage data were arcsine transformed prior to analysis using ANOVA and Student-Newman-Keuls 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.

Wet weather coincided with the onset of anthesis, making conditions highly favorable for FHB and leaf blotch complex development. Significant differences were observed among treatments for leaf blotch complex, glume blotch, leaf rust, FHB, DON, yield and test weight, but treatments did not differ for FDK. Tebuzol applied at F4-5 was ineffective for reducing disease levels, with the exception that the higher rate of Tebuzol reduced leaf rust compared to the non-treated control. Both Tebuzol and Folicur applied at F10.51 significantly reduced the

leaf blotch complex (especially on the flag leaf) and leaf rust, but neither treatment significantly reduced levels of glume blotch, FHB, or DON compared to the non-treated control. Treatments involving Tebuzol applied at F4-5 followed by application of Caramba at F10.51 provided significant control of leaf blotch complex, glume blotch, leaf rust, FHB, and DON compared to the non-treated control. All treatment involving an application at F10.51 significantly improved yield and test weight compared to the non-treated control and the F4-5 treatments. No phytotoxicity was noted in the test.

Treatment, rate/A, and growth stage applied ^z	Leaf blotch complex ^y		Glume blotch ^x	Leaf rust ^w	Fusarium head blight			FDK ^s	DON ^r	Yield ^q	Test weight
	Flag (%)	F-1 (%)	Index (%)	Flag (%)	Inc. ^v (%)	Sev. ^u (%)	Index ^t (%)	(%)	(ppm)	(bu/A)	(lb/bu)
Non-treated.....	29.1a ^p	91.2a	2.8a	2.6a	42.4a	22.9ab	9.6ab	3.9a	2.5ab	76.6c	49.7b
Tebuzol 3.6F 2 fl oz F4-5.....	19.7a	90.1a	2.7a	2.1ab	42.4a	20.8ab	8.9ab	4.1a	2.9a	78.6c	49.7b
Tebuzol 3.6F 4 fl oz F4-5.....	20.2a	93.2a	3.1a	1.6b	38.0a	27.8a	10.6a	3.8a	2.2ab	79.8c	49.4b
Folicur 3.6F 4 fl oz F10.51.....	3.4b	73.6ab	2.0a	0.0c	37.7a	19.4ab	7.0ab	2.3a	2.0bc	90.7a	52.0a
Tebuzol 3.6F 4 fl oz F10.51.....	2.8b	67.0bc	2.2a	0.0c	34.0a	16.9ab	5.9bc	1.8a	1.7bc	85.9b	51.6a
Tebuzol 3.6F 2 fl oz fb Caramba 13.5 fl oz + Induce 0.125% F4-5, 10.51.....	0.4b	28.9d	0.4b	0.0c	24.0b	14.2b	3.5cd	1.7a	1.1c	93.1a	53.2a
Tebuzol 3.6F 4 fl oz fb Caramba 13.5 fl oz + Induce 0.125% F4-5, 10.51.....	0.7b	46.9cd	0.2b	0.0c	19.2b	12.7b	2.6d	1.9a	1.3c	92.6a	53.4a
<i>P</i> -value for F statistic	<.0001	<.0001	<.0001	<.0001	<.0001	0.0023	<.0001	0.0064	<.0001	<.0001	<.0001
CV (%)	32.79	15.49	27.05	24.91	10.93	14.58	16.60	22.91	23.15	3.32	2.21

^zFeeke's growth stage (F). Fb = followed by.

^yPercentage of leaf blotch complex, primarily *S. nodorum*, was visually estimated on flag and flag-1 leaves of 10 plants per plot.

^xGlume blotch ratings were based on visual estimation of infected spikelets on 100 heads rated under laboratory conditions. Glume blotch severity was determined by visually estimating the percent surface area diseased per spike. Index = (% incidence x % severity)/100.

^wLeaf rust, *P. triticina* was visually estimated on flag leaves of 10 plants per plot.

^vFusarium head blight incidence was based on visual estimation of infected spikelets on 100 heads rated under laboratory conditions.

^uFusarium head blight severity was calculated by counting the no. of infected spikelets/spike and dividing by the mean number of total spikelets of 10 arbitrarily-selected spikes (i.e. 100% of spike surface area) and multiplying by 100.

^tFusarium head blight index = (% incidence x % severity)/100.

^sFusarium damaged kernels were assessed by air separation.

^rDeoxynivalenol (DON).

^qBased on 13.5% moisture and 60 lbs/bu.

^pColumn numbers followed by the same letter are not significantly different, Student-Newman-Keuls test ($P \leq 0.05$).