EVALUATION OF SEED TREATMENTS ON STAND, FOLIAR AND HEAD DISEASE, AND YIELD OF SCABBY WINTER WHEAT SEED, 2010.

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The main objective of this experiment was to evaluate the effect of various seed treatments on stand establishment of presumed "scabby" winter wheat seed. In 2009, Fusarium head blight (FHB) disease levels in Kentucky were damaging. Seed of the soft red winter wheat cultivar 'Cumberland' harvested 25 Jun 09 from non-treated test plots was saved for use in this experiment. FHB and *Stagonospora nodorum* glume blotch disease indexes in the non-treated plots ranged from 4.2-25.8 % and 1.0-5.6 %, respectively. In Sep 09 the University of Kentucky Seed Testing Lab reported germination rates of 86% for the non-treated scabby seed lot and 84% following hand-treatment with Raxil-Thiram (4 oz/100 lb). The lab reported the presence of Fusarium spp. fungal growth in the germination analysis which could potentially reduce germination. Seed treatments were applied by Valent and planted no-till following corn harvest on 19 Oct 09 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 ft^2 and consisted of seven rows on 7-in. spacing. No adjustments were made for reduced germination in seeding calculations. Warrior insecticide was applied (3.5 fl oz/A) on 21 Nov 09 and again on 23 Mar 10 at crop green-up to reduce the potential for barley yellow dwarf. Liquid nitrogen (28-0-0) was applied in a February/April split application at a rate of approximately 40 and 80 lbs/A on 20 Feb 10 and 1 Apr 10, respectively. Weeds were controlled by applying Harmony Extra herbicide (0.5 fl oz/A) on 23 Mar 10. On 2 Apr 10, strip rows were subdivided into 20-ft plots by application of Round-up herbicide. The experimental design was a randomized complete block with five replications. Stand counts were made 11 Nov, 23 days after planting (DAP) by counting the number of plants in three, 20.5-in lengths near the middle of the four center rows of each plot. Plots were rated for Stagonospora blotch and leaf rust at the early-milk stage (F11) on 18 May and a second time as a complex on 27 May at late-milk-early dough stage (F11.1-2). Foliar ratings were made by visually estimating the percentage leaf surface area diseased for flag and flag-1 leaves of 10 arbitrarily-selected plants per plot. FHB incidence was based on visual estimation of infected spikelets on a total of 50 spikes per plot at late-milk (F11.1) on 26 May. FHB severity was visually estimated as a percentage of surface area affected on 5 total spikes per plot at late milk (F11.1) on 26 May. Plots were harvested on 15 Jun 10 using a Wintersteiger small-plot combine. Yields were adjusted to 13.5% moisture and 60

lb/bu. Post harvest tiller counts were taken on 15 Jun 10 by counting the number of tillers in two, 20.5-in lengths from rows three and four. A hand-cleaned, 25-g grain sample from each plot was assessed for kernel health by counting the number of shriveled kernels (SK) per 100 kernel sample and was submitted to the University of Minnesota, DON Analysis Laboratory, 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.

No disease or insects were observed when performing stand counts taken in the fall, 23 days after planting. Consequently, no significant differences in stand count were observed between the different seed treatments when compared to the non-treated control. Conditions were favorable for foliar disease development throughout the month of May during grain fill. No significant differences in leaf rust and Stagonospora blotch were observed at any leaf position among the different seed treatments when compared to the non-treated control when rated 18 and 27 May. FHB disease levels were moderately low throughout the test and no significant differences were observed between the different seed treatments and non-treated control for FHB incidence and index. Significant differences were only observed between the Cruiser and V-10304 seed treatment for FHB severity; however these treatments were not significantly different from the non-treated control. Shriveled kernels, DON, yield, and test weight were not significantly different when compared to the non-treated control. Only the Cruiser seed treatment had significantly less number of tillers at post harvest than the non-treated control. No evidence of phytotoxicity was observed for any treatment.

Treatment and rate	Stand count[z] 23 DAP (n/ft^2)	Post harvest tiller count[y] (n/ft^2)	18 May Leaf rust[x] Flag (%)	F-1 (%)	F-2 (%)	18 May Stagonospora blotch[w] Flag (%)	F-1 (%)	F-2 (%)	27 May Leaf rust/Stagonospora blotch complex[v] Flag (%)	F-1 (%)	Fusarium head blight (FHB) Inc.[u] (%)	Sev.[t] (%)	Index[s] (%)	SK[r] (%)	DON[q] (ppm)	Yield[p] (bu/A)	Test weight (lb/bu)
Non-treated…….....	29.5NS[o]	61.9a[n]	1.9NS	2.6NS	1.7NS	0.1NS	3.6NS	11.9NS	65.7NS	98.4NS	10.4NS	21.0ab	2.3NS	19.5NS	0.4NS	97.3NS[m]	56.6NS
Raxil 1.5 gai/hkg[l]																	
Allegiance-Fl 2.0 gai/hkg.....	27.2	62.0a	2.0	2.4	1.6	0.0	2.4	12.6	71.3	98.6	12.0	27.6ab	3.6	15.6	0.6	82.7	57.1
Raxil 1.5 gai/hkg																	
Allegiance-Fl 2.0 gai/hkg																	
Gaucho 600FS 0.75 fl oz/cwt[k]…..	28.7	56.3ab	2.9	2.8	2.2	0.1	4.6	19.9	73.0	98.8	15.2	32.0ab	4.9	18.4	0.5	96.7	55.8
Dividend XL RTA 5.0 fl oz/cwt																	
Cruiser 0.75 fl oz/cwt……	30.2	51.5b	1.9	2.3	1.5	0.1	3.8	12.5	59.2	96.4	14.8	36.9a	5.6	15.8	0.4	91.0	56.5
V-10304 7.5 fl oz/cwt……	27.2	58.4ab	3.0	3.3	2.8	0.2	4.1	17.9	73.4	98.8	12.8	18.6b	2.3	20.6	0.5	91.4	56.3
V-10305 1.0 fl oz/cwt……	25.7	61.7a	2.1	3.1	2.0	0.1	4.0	13.9	67.7	98.1	16.4	21.2ab	3.4	16.6	0.6	93.4	54.7
V-10305 1.0 fl oz/cwt																	
Nipsit Inside Insect 0.75 fl oz/cwt.	28.5	59.5a	3.6	2.6	2.4	0.0	4.2	17.8	63.9	97.5	16.0	25.7ab	4.1	16.8	0.5	97.5	56.8
P-value for F statistic	0.4605	0.0127	0.8970	0.9584	0.7991	0.5573	0.9015	0.5928	0.9414	0.9869	0.4868	0.0307	0.0678	0.8129	0.7430	0.0975	0.1604
CV (%)	6.4	4.0	42.6	31.3	35.2	108.9	33.9	29.3	29.1	8.7	19.7	18.7	25.2	17.7	46.3	8.6	2.4

[z]Stand counts were taken 11 Nov, 23 days after planting (DAP). Aphids were not observed.
[y]Tiller counts were taken 15 Jun post harvest.
[x]Leaf rust, *P. triticina* was visually estimated on flag and flag-1, -2 leaves of 10 plants per plot at early milk, Feeke's growth stage (F) 11.0 on 18 May.
[w]Percentage of Stagonospora blotch, primarily *S. nodorum*, was visually estimated on flag and flag-1, -2 leaves of 10 plants per plot at early milk (F11.0) on 18 May.
[v]Complex of leaf rust and Stagonospora blotch was visually estimated on flag and flag-1 leaves of 10 plants per plot at late-milk-early dough stage (F11.1-2) on 27 May.
[u]Fusarium head blight incidence was based on visual estimation of infected spikelets on a total of 50 spikes per plot; ratings were made at late-milk (F11.1) on 26 May.
[t]Fusarium head blight severity was visually estimated as a percentage of surface area affected on 5 total spikes per plot at late milk (F11.1) on 26 May.
[s]Fusarium head blight index = (% incidence x % severity)/100.
[r]Percentage of shrievled kernels in a 100 kernel grain sample.
[q]Deoxynivalenol (DON).
[p]Based on 13.5% moisture and 60 lbs/bu.
[o]NS = no significant differences with the column of data; data are the mean of 5 replications ($P \leq 0.05$).
[n]Column numbers followed by the same letter are not significantly different, Student-Newman-Keuls test ($P \leq 0.05$).
[m]NS = no significant differences with the column of data ($P \leq 0.1$).
[l]Grams active ingredient/hundred kg seed.
[k]Fluid oz/hundred weight seed.