

Results From 2011 On-Farm Fungicide Trials In Corn



**DR. PAUL VINCELLI AND
DR. DAVID FOURQUREAN**

LEXINGTON, KY.

Several years ago, fungicide use in corn started to become somewhat common in Kentucky and beyond. Ever since then, university corn pathologists have worked hard to conduct and evaluate research that allows us to provide science-based recommendations to producers.

Much of this research has been published in refereed science journals – a mark of strict quality control. Two key publications are listed at the end of this article. Based on those papers as well as on other research, the current consensus of university pathologists is two-fold:

- Fungicides on corn can be beneficial when pressure from certain foliar diseases (like gray leaf spot) is significant.

- “Plant health” benefits in the absence of significant disease can occur, but they are not consistent or frequent enough to justify routine fungicide use.

Although this consensus is well-supported by years of research, scientists are always interested in continuing to test and confirm, test and confirm. In that spirit, we set up three on-farm fungicide tests in Western Kentucky last summer. These tests were all conducted according to accepted scientific standards, including randomization and replication. Plots were 120 feet wide and ran the length of the field (two or three reps in a RCBD). All three corn fields were conventional-tilled and received no irrigation. They were planted 9-17 May 2011. All received a single application of Headline® at 6 oz/A by helicopter at R1-R2. In Trial III, Strive 2 oz/A + Mustang Max 3 oz/A + Protect Surfactant 0.48 oz/A were also included in the tank.

Results for each trial are shown in the tables below. In order to interpret the tables, here are

Figure 1. Trial I, white corn (Pioneer Brand 1431W) on 20-inch rows, previous crop=wheat/doublecrop soybean.

Figure 2. Trial II, yellow corn (Pioneer Brand 1184HR) on 20-inch rows, previous crop=corn.

Figure 3. Trial III, yellow corn (Pioneer Brand 32B10) on 30-inch rows, previous crop=soybean.

some facts:

- “Stalk strength” was measured by pushing 50 stalks at chest height in each plot and recording whether they sprung back or broke.

- “GLS” indicates the percent of ear leaf damage from gray leaf spot at black layer. You can see that all three trials had extremely low disease pressure, because of dry weather preceding and during grain fill.

- “Error (%)” shows the risk of being wrong if you conclude that the Headline® treatment was different from the untreated check. (This is the P-value X 100.)

- “CV%” is a measure of the amount of variation in the trial.

- There was a moderate drought during the grain fill period.

Results

Trial I: Stalk strength appeared to be im-

proved in the Headline®-treated plots, although with the error rate of 14%, so one should be cautious about this observation. No significant difference was seen for other variables.

Trial II: Stalk strength was significantly improved, and yield was increased substantially with Headline®, even though disease pressure was almost non-existent.

Trial III: Yield was greatly improved with Headline®, though no improvement in stalk strength was noted. Moisture content was higher in the Headline®-treated plots.

Conclusion

We observed substantial yield improvement from Headline® in two of three on-farm trials, as

Treatment	GLS at R6 (%)	Stalk strength (% weak)	Yield (Bu/Acre)	Moisture content
Untreated	0.2	22	182	19.9
Headline	0.1	9	188	20.3
Error (%)	67	14	89	67
CV %	124	16.8	14.0	4.5

Figure 1

Treatment	GLS at R6 (%)	Stalk strength (% weak)	Yield (Bu/Acre)	Moisture content
Untreated	0.1	40	178	16.4
Headline	0.1	17	198	17.5
Error (%)	80	7	9	29
CV %	119	19.8	4.5	3.3

Figure 2

Treatment	GLS at R6 (%)	Stalk strength (% weak)	Yield (Bu/Acre)	Moisture content
Untreated	0.5 a	10	202	17.6
Headline	0.1	9	229	18.6
Error (%)	58	43	7	6
CV %	119	31.4	1.0	0.4

Figure 3

well as improved stalk strength in at least one trial with 20-inch row spacing. The agronomic benefits observed in these trials appear to be “plant health” effects, because damage from foliar disease was at trivial levels. It has been difficult to see plant health benefits like these consistently or predictably in university research, and we don’t know whether we will see them again. Nevertheless, these results justify our continuing to conduct large-scale, on-farm, scientifically valid tests this coming growing season, in order to see whether we can reproduce these kinds of agronomic improvements.

Key Literature

Paul et al. 2011. Meta-analysis of yield response of hybrid field corn to foliar fungicides in the U.S. Corn Belt. *Phytopathology* 101:1122-1132

Wise and Mueller, 2011. Are Fungicides No Longer Just For Fungi? An Analysis of Foliar Fungicide Use in Corn. *APSnet Features*. doi:10.1094/APSnetFeature-2011-0531. Δ

DR. PAUL VINCELLI: *Extension Plant Pathologist, University of Kentucky*

DAVID FOURQUREAN: *Extension Agent for Agriculture and Natural Resources – Trigg Co. Extension, University of Kentucky*