

# The Evaluation of New Seed Treatment Options for KY Wheat Growers & Their Effect on Seeding Rates & Planting Dates

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## Introduction:

The objective of this research is to investigate the increasing array of seed treatments available for use on wheat. Some of these new seed treatments allow us to reach outside the box with some of our cultural practices relating to seeding rates and planting dates. This study will investigate insecticide seed treatments and their potential influence on current planting practices.

## Materials and Methods:

The testing site for this study was located at the Miles Gallrien farm in southern Logan County near Schochoh, KY. This is an established field crop research location maintained by Miles Research Division. Conventional tillage was used for the Schochoh plot, two passes were made with a heavy disk and roller. The plot was planted with an Almaco heavy duty no-till grain drill with the variety Exsegen Sarah. The planting depth for each plot was one inch. Plots were eight rows wide with 7.5 inch spacing between rows. Each plot was five feet wide by 30 feet long with four replications per treatment. This trial consisted of three different planting dates: Oct 3 (Early), Oct 13 (Mid) and Nov 3 (Late). These dates were selected to bracket the optimal fall wheat planting window for southern KY of October 10 through October 20. There were three seeding rates: 125 seeds/yd<sup>2</sup> (low population), 225 seeds/yd<sup>2</sup> (medium population) and 325 seeds/yd<sup>2</sup> (high population) at each of the three planting dates. For each seeding rate there are four treatments which are: No insecticide seed treatment (untreated check), no insecticide seed treatment with a fall application of Lambda-Cyhalothrin (Warrior) at 2.56 ounces per acre, an insecticide seed treatment of Cruiser 5FS at 1 fl oz/100 lb of seed, and another insecticide seed treatment consisting of Gaucho 600 at 0.8 fl oz/100 lb of seed. **The seed for all treatments received an application of Dividend Extreme (Difenconazole and Mefenoxam) at 2 fl oz/100 lb of seed.** Emergence was good following all planting dates although fall growth was minimal for the late planting date (Nov 3) due to cool conditions.

Weed control consisted of a spring application of Thifensulfuron-methyl, Tribenuron Methyl (Harmony Extra) at 0.6 ounces per acre and NIS (Premium 90) at 0.25%v/v. Nitrogen fertilizer was split applied with 40 lbs/acre applied in February and 60 lbs/acre applied in March. The plot received two applications of Lambda-Cyhalothrin (Warrior) at 2.56 ounces per acre in the spring for insect control. Propiconazole (Tilt) at 2 ounces per acre and Azoxystrobin/ Propiconazole (Quilt) at 14 ounces per acre was applied for leaf disease control. The trial was harvested on June 20, 2009. All plots were harvested with a Massey 8 combine with a 6.5 foot head. The plots were harvested, weighed, and percent grain moisture measured. The data was recorded on a Harvest Master computer, and downloaded into ARM software for statistical analysis. The experimental design was a randomized complete block with four replications per treatment. Treatment information is listed in Table 1. Each treatment is repeated at the three

planting dates. Targeted planting dates for this trial were early October, Mid October and early November.

**(Table 1.) Treatment List**

Trt No.	Treatment Name	Rate	Unit	Growth Stage
1	Untreated - 125 sd/yd			
2	Untreated - 225 sd/yd			
3	Untreated - 325 sd/yd			
4	125 sd/yd with fall applied Warrior	2.56	oz/a	Fall Threshold
5	225 sd/yd with fall applied Warrior	2.56	oz/a	Fall Threshold
6	225 sd/yd with fall applied Warrior	2.56	oz/a	Fall Threshold
7	Cruiser - 125 sd/yd	1	oz/cwt	Seed Trt
8	Cruiser- 225 sd/yd	1	oz/cwt	Seed Trt
9	Cruiser - 325 sd/yd	1	oz/cwt	Seed Trt
10	Gaicho - 125 sd/yd	0.8	oz/cwt	Seed Trt
11	Gaicho - 225 sd/yd	0.8	oz/cwt	Seed Trt
12	Gaicho - 325 sd/yd	0.8	oz/cwt	Seed Trt

**Results:** The results for the Schochoh, KY trial are shown in Table 2.

**(Table 2.) Schochoh Yield Data.**

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Oct 3 Yield bu/ac	Oct 13 Yield bu/ac	Nov 3 Yield bu/ac
1	Untreated - 125 sd/yd				97.3	101.0	92.5
2	Untreated - 225 sd/yd				96.1	102.7	100.2
3	Untreated - 325 sd/yd				95.0	102.6	98.7
4	125 sd/yd with fall applied Warrior	2.56	oz/a	Fall	96.1	102.2	96.9
5	225 sd/yd with fall applied Warrior	2.56	oz/a	Fall	95.0	102.6	100.1
6	225 sd/yd with fall applied Warrior	2.56	oz/a	Fall	95.3	103.6	98.6
7	Cruiser - 125 sd/yd	1	oz/cwt	Seed Trt	95.5	102.6	97.3
8	Cruiser- 225 sd/yd	1	oz/cwt	Seed Trt	97.0	102.0	98.6
9	Cruiser - 325 sd/yd	1	oz/cwt	Seed Trt	97.2	102.5	99.0
10	Gaicho - 125 sd/yd	0.8	oz/cwt	Seed Trt	96.5	103.0	97.2
11	Gaicho - 225 sd/yd	0.8	oz/cwt	Seed Trt	98.8	102.9	100.2
12	Gaicho - 325 sd/yd	0.8	oz/cwt	Seed Trt	99.6	100.2	100.4
LSD (P=.05)				3.2			
Standard Deviation				2.28			
CV				2.31			
Grand Mean				99.08			

Table 3 shows the impact that planting date had on this trial in this growing season. The Oct 3 planted plots had the lowest yield averaging 96.6 bu/ac. The later planted plots (Oct 13 and Nov 3) had higher yields, of 102.3 and 98.3 bu/ac, respectively. These yield increases were statistically significant with respect to the LSD of 3.2 bu/ac. This data reinforces the idea that the ideal planting date for wheat in Kentucky is mid October. The results also show that acceptable yields can be obtained at the later planting date.

**(Table 3.)**

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Oct 3 Yield bu/ac	Oct 13 Yield bu/ac	Nov 3 Yield bu/ac
1	Untreated - 125 sd/yd				97.3	101.0	92.5
2	Untreated - 225 sd/yd				96.1	102.7	100.2
3	Untreated - 325 sd/yd				95.0	102.6	98.7
4	125 sd/yd with fall applied Warrior	2.56	oz/a	Fall	96.1	102.2	96.9
5	225 sd/yd with fall applied Warrior	2.56	oz/a	Fall	95.0	102.6	100.1
6	225 sd/yd with fall applied Warrior	2.56	oz/a	Fall	95.3	103.6	98.6
7	Cruiser - 125 sd/yd	1	oz/cwt	Seed Trt	95.5	102.6	97.3
8	Cruiser- 225 sd/yd	1	oz/cwt	Seed Trt	97.0	102.0	98.6
9	Cruiser - 325 sd/yd	1	oz/cwt	Seed Trt	97.2	102.5	99.0
10	Gaicho - 125 sd/yd	0.8	oz/cwt	Seed Trt	96.5	103.0	97.2
11	Gaicho - 225 sd/yd	0.8	oz/cwt	Seed Trt	98.8	102.9	100.2
12	Gaicho - 325 sd/yd	0.8	oz/cwt	Seed Trt	99.6	100.2	100.4
<b>Average of all treatments</b>					<b>96.6</b>	<b>102.3</b>	<b>98.3</b>

Table 4 shows the averages of each treatment at the various planting dates. At the early planting date the insecticide seed treatments did not show a significant yield increase over the untreated, with average increase of 0.5 bu/ac for the Cruiser treatments and 2.2 bu/ac for the Gaicho treatments. The treatments which received Lambda-Cyhalothrin (Warrior) at 2.56 ounces per acre had an average yield decrease of 0.6 bu/ac when compared to the untreated check. None of the treatments had a significant yield response with respect to the Least Significant Difference (LSD) of 3.2 bu/ac.

**(Table 4.)**

Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Oct 3 Yield bu/ac	Oct 13 Yield bu/ac	Nov 3 Yield bu/ac
1	Untreated - 125 sd/yd2				97.3	101.0	92.5
2	Untreated - 225 sd/yd2				96.1	102.7	100.2
3	Untreated - 325 sd/yd2				95.0	102.6	98.7
<b>Untreated Average</b>					<b>96.1</b>	<b>102.1</b>	<b>97.1</b>
4	125 sd/yd2 with fall applied Warrior	2.56	oz/a	Fall	96.1	102.2	96.9
5	225 sd/yd2 with fall applied Warrior	2.56	oz/a	Fall	95.0	102.6	100.1
6	325 sd/yd2 with fall applied Warrior	2.56	oz/a	Fall	95.3	103.6	98.6
<b>Fall Warrior Average</b>					<b>95.5</b>	<b>102.8</b>	<b>98.5</b>
7	Cruiser - 125 sd/yd2	1	oz/cwt	Seed Trt	95.5	102.6	97.3
8	Cruiser - 225 sd/yd2	1	oz/cwt	Seed Trt	97.0	102.0	98.6
9	Cruiser - 325 sd/yd2	1	oz/cwt	Seed Trt	97.2	102.5	99.0
<b>Cruiser Average</b>					<b>96.6</b>	<b>102.4</b>	<b>98.3</b>
10	Gaicho 600 - 125 sd/yd2	0.8	oz/cwt	Seed Trt	96.5	103.0	97.2
11	Gaicho 600 - 225 sd/yd2	0.8	oz/cwt	Seed Trt	98.8	102.9	100.2
12	Gaicho 600 - 325 sd/yd2	0.8	oz/cwt	Seed Trt	99.6	100.2	100.4
<b>Gaicho Average</b>					<b>98.3</b>	<b>102.0</b>	<b>99.3</b>

At the late planting date, none of the treatments showed a significant yield response in comparison to the untreated plot average. The Cruiser treatments had an average increase of 1.2 bu/ac and the Gaucho treatments had an average increase of 2.2 bu/ac. The treatments which received Lambda-Cyhalothrin (Warrior) at 2.56 ounces per acre had an average yield increase of 1.4 bu/ac. None of the treatments at the late planting date had a significant yield increase over the LSD of 3.2 bu/ac.

The data in table 5 shows that the seeding rate had very little impact on yield at the Oct 3 and Oct 13 planting dates. The Nov 3 planting date did show yield increases as the seeding rate was increased from the lowest rate of 125 sd/yd<sup>2</sup> to the higher seeding rates of 225 and 325 sd/yd<sup>2</sup>. Yield increased 3.8 and 3.2 bu/ac, respectively at the medium and high seeding rates at this later planting date. These yield increases were statistically significant with respect to the LSD of 3.2 bu/ac.

**(Table 5.)**

<b>October 3 Planted Treatments</b>					<b>125 sd/yd</b>	<b>225 sd/yd</b>	<b>325 sd/yd</b>
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Yield bu/ac	Yield bu/ac	Yield bu/ac
1	Untreated	2	oz/cwt	Seed Trt	97.3	96.1	95.0
4	Fall applied Warrior	2.56	oz/a	Fall	96.1	95.0	95.3
7	Cruiser	1	oz/cwt	Seed Trt	95.5	97.0	97.2
10	Gaucho 600	0.8	oz/cwt	Seed Trt	96.5	98.8	99.6
<b>Oct 3 Average</b>					<b>96.4</b>	<b>96.7</b>	<b>96.8</b>
<b>October 13 Planted Treatments</b>					<b>125 sd/yd</b>	<b>225 sd/yd</b>	<b>325 sd/yd</b>
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Yield bu/ac	Yield bu/ac	Yield bu/ac
1	Untreated	2	oz/cwt	Seed Trt	101.0	102.7	102.6
4	Fall applied Warrior	2.56	oz/a	Fall	102.2	102.6	103.6
7	Cruiser	1	oz/cwt	Seed Trt	102.6	102.0	102.5
10	Gaucho 600	0.8	oz/cwt	Seed Trt	103.0	102.9	100.2
<b>Oct 13 Average</b>					<b>102.2</b>	<b>102.6</b>	<b>102.2</b>
<b>November 3 Planted Treatments</b>					<b>125 sd/yd</b>	<b>225 sd/yd</b>	<b>325 sd/yd</b>
Trt No.	Treatment Name	Rate	Rate Unit	Growth Stage	Yield bu/ac	Yield bu/ac	Yield bu/ac
1	Untreated	2	oz/cwt	Seed Trt	92.5	100.2	98.7
4	Fall applied Warrior	2.56	oz/a	Fall	96.9	100.1	98.6
7	Cruiser	1	oz/cwt	Seed Trt	97.3	98.6	99.0
10	Gaucho 600	0.8	oz/cwt	Seed Trt	97.2	100.2	100.4
<b>Nov 3 Average</b>					<b>96.0</b>	<b>99.8</b>	<b>99.2</b>

**Conclusions:**

This trial reaffirms that the optimum time to plant wheat in Kentucky is mid October. This resulted in the highest average yields among the three planting dates. Early October planted wheat averaged 96.6 bu/ac compared to 102.3 bu/ac and 98.3 bu/ac for the mid October and early November planting dates, respectively.

This trial also shows that seed treatments had only a slight advantage this year over the untreated plots, with a average yield increase of 0.5 bu/ac for the Cruiser treatments and 2.2 bu/ac for the Gaucho treatments at the Oct 3 planting date. The Oct 13 planting date seed treatments had the least yield impact in which the Cruiser seed treatment plots yielded 0.3 bu/ac higher than the untreated and the Gaucho seed treatment plots yielded 0.1 bu/ac lower than the untreated plot. At the Nov 3 planting date the insecticide seed treatment plots yielded 1.2 bu/ac and 2.2 bu/ac more than the untreated plot for Cruiser treated and Gaucho treated plots respectively.

Of the three factors researched in this trial - planting date, insecticide seed treatment and seeding rate - the planting date had the most impact on yield with the mid October planting date yielding 5.7 bu/ac and 4.0 bu/ac more than the early October and early November planting dates, respectively.

Seeding rate had very little yield impact at the October planting dates, although the Nov 3 planting date did show yield increases as the seeding rate was increased from the lowest rate of 125 sd/yd<sup>2</sup> to the higher seeding rates of 225 and 325 sd/yd<sup>2</sup>. Yield increased 3.8 and 3.2bu/ac at the higher seeding rates at this later planting date.

**Summary:**

Data in the summary table that follows represents an average of yield results collected from both the 2009 study and an identical study conducted in 2008. This two-year data also reinforces the idea that mid October is the best time to plant wheat in southern Kentucky, but that good yields can also be harvested from early October planted wheat and even late planted wheat. It also shows acceptable yields can be obtained from reduced planting rates in October, but that once November arrives higher plant populations are required to get full yield potential. The insecticide seed treatments show some benefit for the mid October planting date but the early and late seed treatments aren't showing a benefit. The early planted seed treatments apparently aren't lasting through the fall and the late planted seed treatments are probably not required. This data also shows that a wait and spray approach utilizing a scouting program and a fall applied insecticide may work as well as – or perhaps even better than – seed treatment insecticides. The early seed treatment may not last the entire fall and may require a follow-up spraying.

Lessons learned from this trial:

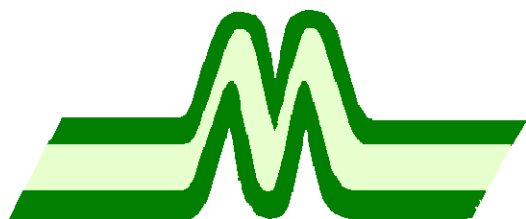
- We can successfully plant wheat early, manage aphids and get good yields,
- We can reduce seeding rates in October and get good yields,
- Early seed treatment insecticides may not last the entire fall and may need a follow-up spray,
- Late planted wheat will benefit from higher plant populations, and
- In terms of aphid management, a wait and spray program can work assuming all acres can be sprayed at the proper time. Large acreage growers may need to use insecticide seed treatments as insurance if all their acres can't be sprayed when needed.

# Miles Farm Supply

KySGGA Planting Date by Insecticide Trial 2 Year Summary  
Results from 2008 and 2009 Harvest

Location: Russellville, KY

Trt No.	Treatment Name	Rate	Unit	Growth Stage	Early Oct	Mid Oct	Early Nov	Treatment Avg by Planting Rate
1	Untreated - 125 sd/yd2				99.2	100.1	94.7	98.0
2	Untreated - 225 sd/yd2				101.1	101.2	102.8	101.7
3	Untreated - 325 sd/yd2				100.1	102.8	101.7	101.5
<b>2 Year Untreated Average</b>					<b>100.1</b>	<b>101.4</b>	<b>99.7</b>	
4	125 sd/yd2 - with fall applied Warrior	2.56	oz/a	Fall	106.8	109.2	99.0	105.0
5	225 sd/yd2 - with fall applied Warrior	2.56	oz/a	Fall	106.3	109.8	103.7	106.6
6	325 sd/yd2- with fall applied Warrior	2.56	oz/a	Fall	105.8	109.2	102.6	105.9
<b>2 Year Fall Warrior Average</b>					<b>106.3</b>	<b>109.4</b>	<b>101.8</b>	
<b>bu/ac increase over Untreated</b>					<b>6.2</b>	<b>8.0</b>	<b>2.0</b>	
7	Cruiser - 125 sd/yd2	1	oz/cwt	Seed Trt	104.3	103.9	96.1	101.4
8	Cruiser - 225 sd/yd2	1	oz/cwt	Seed Trt	99.2	102.5	100.2	100.6
9	Cruiser - 325 sd/yd2	1	oz/cwt	Seed Trt	101.0	105.1	103.4	103.2
<b>2 Year Cruiser Average</b>					<b>101.5</b>	<b>103.8</b>	<b>99.9</b>	
<b>bu/ac increase over Untreated</b>					<b>1.3</b>	<b>2.5</b>	<b>0.2</b>	
10	Gaicho 600 - 125 sd/yd2	0.8	oz/cwt	Seed Trt	98.9	105.6	98.0	100.8
11	Gaicho 600 - 225 sd/yd2	0.8	oz/cwt	Seed Trt	101.9	104.6	101.0	102.5
12	Gaicho 600 - 325 sd/yd2	0.8	oz/cwt	Seed Trt	101.3	100.5	102.6	101.5
<b>2 Year Gaicho Average</b>					<b>100.7</b>	<b>103.6</b>	<b>100.5</b>	
<b>bu/ac increase over Untreated</b>					<b>0.6</b>	<b>2.2</b>	<b>0.8</b>	
<b>2 Year Average of All Treatments by Planting Date</b>					<b>102.1</b>	<b>104.5</b>	<b>100.5</b>	



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