The Impact Of Fungicides On Corn Produced In The Mid-South

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Fungicides are used in many crops produced in the Mid-South; however, it wasn't until recently this practice was promoted in corn. Even though plant residues in reduced tillage systems can harbor plant pathogens, it is not known if fungicides will increase the productivity of corn. Therefore, research was initiated across the Mid-South to evaluate this practice. Research in Louisiana was conducted at selected experiment stations (Dean Lee, Macon Ridge and Northeast Research Stations) and producer fields. The objectives were to: 1. Determine if selected fungicides are effective for managing corn diseases in Louisiana; 2. Determine if yields are higher in fungicide-treated corn than in non-treated corn; and 3. Determine if stalk density in fungicide-treated corn is greater than non-treated corn.

Macon Ridge and Northeast Research Stations: In 2007 and 2008 Quilt and Headline fungicides were evaluated. In 2007, eight and six hybrids were evaluated at the Macon Ridge Research Station and Northeast Research Station, respectively. A single application was made to each variety while in the tasseling growth stage (VT) and compared to the corresponding non-sprayed variety. Plots were monitored periodically for diseases and rated for incidence and severity if present. Stalk density was assessed when corn reached the black layer growth stage (physiological maturity). Yield and test weights were also recorded.

Diseases (rusts and blights) either did not develop or developed late season in both years. Therefore, the impact of fungicides on disease development could not be determined. In 2007, stalk density and yields varied within and across hybrids (Tables 1 and 2). At the Macon Ridge location, yield differences between hybrids treated with Quilt (14.0 fl oz/A) and non-treated hybrids ranged from 15.7 bu/A to -14.3 bu/A, and averaged 4.6 bu/A less across the treated hybrids. Yield differences between hybrids treated with Headline (6.0 fl oz/A) and non-treated hybrids ranged from 33.9 bu/A to -19.7 bu/A and averaged 6.3 bu/A more in Headline-treated plots. Results from the test conducted at the Northeast Research Station in 2008 were similar to those in 2007. A range in yield differences of 11.4 bu/A to -4.3 bu/A between Headline-treated hybrids and non-treated hybrids was observed (Table 3). Corn treated with Headline averaged 2.3 bu/A more than non-treated hybrids. No effects on stalk densities and test weight were observed among most hybrids.

Dean Lee Research Station and Off-Station: During 2007, Headline (6.0 fl oz/A), Quilt (14.0 fl oz/A), Quadris (6.0 fl oz/A), and Stratego (10.0 fl oz/A) were evaluated in 21, 26, 3, and 9 tests, respectively. Producer tests usually consisted of large areas in fields either treated with a fungicide or left non-treated. Twenty-one corn hybrids were evaluated. A single application was made to corn at or near tasseling. Disease epidemics did not develop to appreciable levels in most tests. However, where diseases were observed, incidence and severity was lowest in fungicide-treated corn. When averaged across tests and compared to non-treated corn, yields were 0.89 bu/A, 0.06 bu/A, and 2.38 bu/A higher in corn receiving an application of Headline, Quilt, or Quadris, respectively (Table 4). The average yield of corn treated with Stratego was 1.35 bu/A less than non-treated corn. Even though yield response was minimal or nonexistent, responses from individual hybrids varied considerably. Yield differences ranged between fungicide-treated hybrids and non-treated hybrids by 12 bu/A to -20.4 bu/A for Headline, 14.9 bu/A to -17.2 for Quilt, 9.0 bu/A to -5.3bu/A for Quadris, and 10.7 bu/A to -27.7 bu/A for Stratego.

Summary: The impact of fungicides on disease could not be determined since disease epidemics did not develop to significant levels in most tests. Fungicides did not preserve stalk densities or increase test weights among most hybrids. The impact of fungicides on yield was not consistent among hybrids or across years. Yields of 6 bu/A or higher were observed in 33% of tests including Headline or Quadris, 27% of the tests including Quilt, and 50% of the tests including Stratego when compared to non-treated corn. These inconsistent responses do

not support the practice of automatically applying fungicides to corn. In areas where disease epidemics may develop to damaging levels, the probability of an economic return from a fungicide application may increase.

Table 1. Yields and stalk densities of selected corn hybrids treated with or without a fungicide, Macon Ridge Research Station, Winnsboro, LA 2007.

Hybrid	No fungicide Yield (bu/A)	Fungicide[1] Yield (bu/A)	No fungicide Stalk Density (oz/in^3)	Fungicide[1] Stalk Density (oz/in^3)
Garst 8295YG1RR	130.2	145.9	0.342	0.399
Garst 8248RR	158.7	154.0	0.304	0.335
TV26B82	129.9	126.5	0.368	0.433
TV26BR41	134.6	121.4	0.399	0.417
DKC69-71	141.8	139.1	0.342	0.355
DKC66-23	130.5	116.2	0.435	0.444
Pioneer 33R81	144.0	131.1	0.415	0.379
Pioneer 31G71	152.2	150.9	0.395	0.404

[1]Treated with Quilt @ 14 fl oz/A.

Table 2. Yields and stalk densities of selected corn hybrids treated with or without a fungicide, Northeast Research Station, St. Joseph, LA 2007.

Hybrid	No fungicide Yield (bu/A)	Fungicide[1] Yield (bu/A)	No fungicide Stalk Density (oz/in^3)	Fungicide[1] Stalk Density (oz/in^3)
Garst 8248RR	123.0	134.4	0.410	0.411
TV26B82	126.1	123.3	0.427	0.372
TV26BR41	135.3	169.2	0.421	0.445
DKC69-71	145.2	125.5	0.381	0.357
DKC66-23	150.4	155.5	0.536	0.456
Pioneer 33R81	136.5	146.6	0.445	0.459

[1]Treated with Headline @ 6 fl oz/A + 1% crop oil concentrate.

Notes:

Table 3. Yields and stalk densities of selected corn hybrids treated with or without a fungicide, Northeast Research Station, St. Joseph, LA 2008.

Hybrid	No fungicide Yield (bu/A)	Fungicide[1] Yield (bu/A)	No fungicide Stalk Density (oz/in^3)	Fungicide[1] Stalk Density (oz/in^3)
DKC64-78	106.4	107.0	0.1222	0.1292
DKC69-71	94.9	99.6	0.1001	0.1049
TV26BR41	109.8	121.2	0.1419	0.1362
TV25BR23	110.6	106.3	0.1416	0.1421
PIO31G71	115.2	111.5	0.1256	0.1200
PIO33R81	114.4	119.9	0.1200	0.1163

[1]Treated with Headline @ 6 fl oz/A.

Table 4. Yield of corn treated with selected fungicides in tests conducted in producer fields and on the Dean Lee Research Station, Alexandria, LA 2007.

Fungicide (oz product/A)	# Tests[1]	No Fungicide[2] Yield (bu/A)	Fungicide[3] Yield (bu/A)	Difference[4]
Headline (6.0)	21	199.76	199.64	0.89
Quilt (14.0)	26	199.50	199.56	0.06
Quadris (6.0)	3	200.55	202.93	2.38
Stratego (10.0)	9	188.00	186.65	-1.35

[1]Number of tests in which the fungicide was evaluated.
[2]Average yield of non-treated corn.
[3]Average yield of treated corn.
[4]Difference in bu/A among fungicide treated and non-treated corn.

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SOYBEAN PRESENTATIONS

The Changing Face Of Soybean Cyst Nematode Management

Presented by Dr. Pat Donald
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Managing SCN has become more complex as more is learned about the nematode- plant interaction. There are increasing numbers of reports of fields where a resistant variety has been planted but the SCN population density exploded and yield loss is observed even with the resistant variety.

Traditional strategies to manage soybean cyst nematode, once SCN is detected, is use of resistant soybean varieties rotated with crops which do not support SCN reproduction (Niblack and Tylka, 2008). This works well if the SCN egg population density is low and can be maintained at a low level with soybean production every two or three years. The next iteration was on the plant side and suggested rotation of the sources of plant resistance to slow adaptation of SCN to the different sources of soybean resistance. Although over 120 differ-