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Foliar Fungicide Application Timing for Disease Management, Stay Green, and Yield in Nebraska, 2015

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CORN (*Zea mays*, 'DKC 65-79 RIB')
 Gray leaf spot (*Cercospora zea-maydis*)
 Southern rust (*Puccinia polysora*)

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Foliar fungicide application timing for disease management, stay green, and yield in Nebraska, 2015.

The objective of the trial was to compare foliar fungicides applied at different corn growth stages for gray leaf spot (GLS) and southern rust (SR) efficacy. Irrigated corn was grown based on Nebraska Extension irrigation recommendations at the South Central Ag Lab near Clay Center, NE. Soils were a silt loam with 6.7 pH and 1.8 % organic matter, and the previous crop was soybean. Reduced tillage was performed to the field prior to planting. Corn (DKC 65-79 RIB, tolerant to GLS) was planted at approximately 34,000 seed/A on 26 May, which is later than normal, due to wet spring conditions. Eight treatments were arranged in a randomized complete block design with six replications. Fungicide treatments were applied using a high-clearance sprayer equipped with a 10 ft wide spray boom housing six TeeJet XR11002 spray nozzles with 20-inch spacing. Spray solutions were delivered at 3 mph with 40 psi compressed air for a spray volume of 20 gpa. Treatments were applied to R1-stage corn (i.e., silk) on 13 Aug and R3-stage corn (i.e., milk) on 1 Sep. Plots were assessed for phytotoxicity, GLS, SR severity (7 Oct), and stay green (14 Oct). Plots were harvested on 9 Nov from the center two rows using a Gleaner K2 plot combine. Grain yields were adjusted to 15.5% moisture. All treatments were analyzed using ANOVA, and means were separated using Fisher's protected LSD with $P = 0.10$. Average monthly temperatures (°F) were 72 (Jun), 76 (Jul), 73 (Aug), 72 (Sep) and 58 (Oct). The hottest month was Jul with a high of 97°F on 5 Jul. The longest consecutive days with temperatures >90°F were 31 Aug to 6 Sep. High temperatures at silk through milk stage (29 Jul - 9 Sep) ranged in the low-80s (°F) and decreased to the low-70s (°F). Precipitation was greater than normal in Jun (8.05 in. vs 2.9 in.), and 4.74 in. rain fell on 4 Jun. The longest rain-free occurred from 20 Aug to 3 Sep. An overhead linear sprinkler irrigated the trial (18, 27, and 29 Jul, 17, 24 Aug, and 1 Sep) and delivered approximately 1.6 in. water on each date.

Phytotoxicity was not observed in fungicide treated plots 7 days after treatment (data not shown). Overall, GLS severity was low in this trial, but fungicides significantly reduced development compared to the nontreated check. Headline AMP applied at silk significantly reduced GLS severity compared to Quilt Xcel, and silk and milk applications of Stratego YLD. Southern rust (SR) severity was significantly reduced by all foliar fungicides versus the nontreated check. Headline AMP applied at silk significantly reduced SR severity compared to silk and milk applications of Stratego YLD and Quilt Xcel. All fungicides significantly increased stay green compared to the nontreated check. Corn was greener when applied with Headline AMP at milk versus the other fungicides. Headline AMP and Stratego YLD applied at milk, plus the nontreated check, had significantly greater grain test weights than the other fungicides. Yields were nonsignificant.

Treatment, Formulation, Rate/A	Application Timing ^z	GLS Severity ^y %	SR Severity ^x %	Stay Green ^w %	Test Weight (lb/bu)	Yield bu/A
Headline AMP 1.68 L, 10 fl oz	R1	2.7 d ^v	2.3 e	45.5 a	61.70 abc	253
Stratego YLD 4.18 F, 4 fl oz	R1	3.3 bcd	9.8 cd	36.2 bc	61.77 ab	259
Quilt Xcel 2.2 SE, 10.5 fl oz	R1	4.5 b	13.0 b	35.7 bc	61.47 bcd	249
Headline AMP 1.68 L, 10 fl oz	R3	3.0 cd	7.8 d	39.7 b	61.48 bcd	255
Stratego YLD 4.18 F, 4 fl oz	R3	4.0 bc	10.3 c	34.2 c	61.35 cd	264
Quilt Xcel 2.2 SE, 10.5 fl oz	R3	4.0 bc	11.3 bc	34.0 c	61.32 d	251
Nontreated check	-	9.2 a	19.0 a	24.2 d	62.05 a	250
<i>P</i> -value		0.0001	0.0001	0.0001	0.0199	0.316
CV (%)		27.9	20.1	14.3	0.6	4.65

^z R1 (silk) application = 3 Aug 2015; R3 (milk) application = 1 Sep, 2015.

^y Gray leaf spot (GLS) % severity evaluated 7 Oct, 2015.

^x Southern rust (SR) % severity evaluated 7 Oct, 2015.

^w Stay green was determined by visually estimating the amount of green foliage in each plot; 14 Oct, 2015.

^v Data followed by the same letter or without letters within the column are not significantly different at $P=0.10$ according to Fisher's protected LSD test.