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Foliar Fungicide Modes of Action for Southern Rust Management, Push Lodging, and Yield in Nebraska, 2015

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CORN (*Zea mays* 'DKC 65-79 RIB')
Southern rust (*Puccinia polysora*)

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The objective of the trial was to compare foliar fungicides with different modes of action for 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 gray leaf spot (GLS)) was planted at approximately 34,000 seed/A on 26 May. 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 R2 corn (i.e., blister) on 13 Aug. Plots were assessed for phytotoxicity, SR severity (10 Oct), stay green (16 Oct), and stalk lodging (4 Nov). Corn stalk lodging (push lodging) was assessed by pushing 20 random stalks at shoulder height to the 45° position from vertical. 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 $P = 0.10$. 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 period 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. 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 the R1- through R2-stage (29 Jul - 13 Aug) ranged in the low-80s (°F) and decreased to the mid-70s (°F).

Phytotoxicity was not observed from any foliar fungicide 7 days after treatment (data not shown). Overall, GLS severity was low, and ratings are not included. SR severity was moderate, and all foliar fungicides significantly reduced severity versus the nontreated check. Plots treated with Priaxor had significantly less SR severity compared to all other treatments. Domark was the least effective treatment versus the other foliar fungicides. There was significantly less stalk lodging in all fungicide-treated plots compared to the nontreated check. Within the foliar fungicide treatments, stalk lodging was similar; however, stalk lodging was significantly reduced with Priaxor versus Fortix. Stay green was similar between all foliar fungicides and the nontreated check. There were no significant differences in yield between treatments. Fungicides applied at R2 significantly reduced southern rust severity compared to the nontreated check.

Treatment, Formulation, Rate/A[z]	SR Severity[y] %	Stalk Lodging[x] %	Stay Green[w] %	Yield bu/A
Headline 2.08 SC, 12 fl oz	1.7 d[v]	17.5 bc	29	205
Domark 1.9 ME, 4 fl oz	9.5 b	18.2 bc	22	206
Priaxor 4.17 SE, 8 fl oz	1.0 e	10.8 c	28	200
Affiance 1.5 SC, 8 fl oz	4.9 c	16.7 bc	26	209
Fortix 3.22F, 5 fl oz	2.3 d	21.7 b	24	203
Nontreated check	15.0 a	37.5 a	21	194
P-value	0.0001	0.0007	0.2772	0.3389
CV (%)	21.59	43.2	29.96	5.31

[z] R2 application = 13 Aug 2015.
[y] SR severity evaluated on 9 Oct 2015.
[x] Stalk lodging = % lodged stalks when pushed from shoulder height to the 45° position from vertical; 4 Nov, 2015.
[w] Stay green was determined by visually estimating the percentage of green foliage in plots on 16 Oct, 2015.
[v] Data followed by the same letter or without letters within the column are not significantly different a P=0.10 according to Fisher's protected LSD test.