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# Efficacy Evaluation of Foliar Fungicide Application Timing on Diseases of Field Corn in Nebraska, 2011

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# Efficacy evaluation of foliar fungicide application timing on diseases of field corn in Nebraska, 2011.

A foliar fungicide efficacy timing trial was conducted at the University of Nebraska-Lincoln South Central Agricultural Laboratory near Clay Center, NE. Dekalb corn hybrid DKC 62-54, rating of "good" (6 out of 9) for gray leaf spot (GLS) and "excellent" (2 out of 9) for common rust (CR), was planted on 3 May in 30-in. rows with a target population of 32,000 plants/A. The trial area was disked with soybean as the previous year's crop. On 9 May before plant emergence, a herbicide program of Roundup (1 pt/A), Verdict (16 fl oz/A) and Atrazine (1 lb/A) was applied to the trial site. Seven treatments and a non-treated control were replicated six times in a randomized complete block design. Each plot was four rows (10 ft) wide by 40 ft in length. Foliar fungicides were applied with a modified high-clearance sprayer. The 10 ft spray boom consisted of six nozzles (TeeJet XR11002) spaced 20-in. apart and 18-in. above the canopy. Each treatment was applied at 40 psi traveling at 3.0 mph resulting in a 20 gal/A application volume. Foliar fungicides were applied on 7 Jun (V5) and 14 Jul (R1). Gray leaf spot and common rust severity was visually assessed by estimating percent leaf area covered with lesions over the entire plot on 7 Jun (V5), 20 Jun (V8), 5 Jul (V14), 13 Jul (R1), 1 Aug (R3), 10 Aug (R4), and 24 Aug (R5, milk line one-third from kernel top), and these data were used to calculate area under the disease progress curve (AUDPC). Stay green was visually assessed on 19 Sep as the average percentage of green leaf material remaining on the plant in each plot. Grain was mechanically harvested with a two-row research combine on 20 Oct. The ends of plots were trimmed prior to harvest and the harvested area of each plot was measured following harvest and used to calculate yield. All assessments (disease severity, stay green, and yield) were done in the two center rows of each plot, except push lodging was done in rows one and four. Monthly rainfall and temperature readings were relatively normal during the growing season. Supplemental water was added as needed by an overhead sprinkler linear irrigation system.

Common rust was the first foliar disease observed in this trial. Common rust was first observed on 5 Jul (V14) in trace amounts and remained low and fairly level through the growing season. GLS was first identified in this trial on 1 Aug (R3) in trace amounts and severity remained very low and fairly level throughout the entire season. Neither CR nor GLS severity exceeded 1.8% for any treatment on any rating date. Gray leaf spot lesions were identified on the ear leaf by early August. Common smut, Physoderma brown spot, and southern rust occurred at very low severity levels and their severity was not assessed. The AUDPC calculations indicated all fungicide treatments at any application timing reduced GLS and CR severity compared to the non-treated control. Stay green percentages ranged from 21.6% for Headline AMP 1.67, 10 fl oz/A, V5 to 29.5% for Stratego YLD 4.18 SC, 2 fl oz/A, V5 fb 4 fl oz/A, R1. 500-count kernel weights ranged from 6.15 oz (Quilt Xcel 2.2 SE, 10.5 fl oz/A, V5) to 6.29 oz (non treated-control and Headline AMP 1.67 SC, 10 fl oz/A, V5). Stratego YLD 4.18 SC, 2 fl oz/A, V5 fb 4 fl oz/A, R1 had the highest grain moisture at harvest (15.2%) There were significant differences in yield treatments. Stratego YLD 4.18 SC, 2 fl oz/A, V5 fb 4 fl oz/A, R1 was the highest yielding treatment with 253.1 bu/A.

Treatment, rate/A and application timing	GLS AUDPC <sup>z</sup>	CR AUDPC	Stay Green (%) <sup>y</sup>	500 Kernel Weight (oz)	Grain Moisture (%)	Dry Yield (bu/A) <sup>x</sup>
Non-Treated Control.....	33.2 a <sup>w</sup>	13.0 a	22.8 c	6.29	15.0	238.0 d
Stratego YLD 4.18 SC <sup>v</sup> , 2 fl oz, V5.....	21.9 b	9.2 ab	21.9 c	6.22	15.0	241.5 cd
Stratego YLD 4.18 SC <sup>v</sup> , 2 fl oz, V5 fb 4 fl oz, R1.....	11.8 d	7.8 b	29.5 a	6.20	15.2	253.1 a
Stratego YLD 4.18 SC <sup>v</sup> , 4 fl oz, R1.....	13.0 cd	9.2 ab	27.9 ab	6.20	15.0	248.2 abc
Headline 2.09 EC <sup>v</sup> , 6 fl oz, V5.....	19.9 bc	9.2 ab	24.1 c	6.23	15.0	251.3 ab
Headline AMP 1.67 SC <sup>v</sup> , 10 fl oz, V5.....	26.8 ab	9.7 ab	21.6 c	6.29	15.0	240.4 cd
Quilt 1.66 SC <sup>v</sup> , 10.5 fl oz, V5.....	24.6 b	9.3 ab	25.0 bc	6.19	14.9	243.8 bcd
Quilt Xcel 2.2 SE <sup>v</sup> , 10.5 fl oz, V5.....	27.2 ab	9.7 ab	22.4 c	6.15	14.9	235.1 d
Coefficient of Variation (%)	29.1	26.9	11.7	2.6	2.4	3.0

<sup>z</sup>Area under the disease progress curve.

<sup>y</sup>Stay green was estimated as the percentage of green leaves remaining on the plant.

<sup>x</sup>Yield calculations adjusted to a moisture content of 15.5%.

<sup>w</sup>Data followed by the same letter or without letters within a column are not statistically different ( $P > 0.05$ ) according to the Waller-Duncan k-ratio t Test.

<sup>v</sup>Treatment included NIS, 0.25% V/V