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2013

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Schleicher, C. M. and Jackson-Ziems, T. A., "Efficacy Evaluation of Foliar Fungicide Products on Diseases of Field Corn in Nebraska, 2012" (2013). *Papers in Plant Pathology*. 520.
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Efficacy evaluation of foliar fungicide products on diseases of field corn in Nebraska, 2012.

A foliar fungicide efficacy trial was conducted at the University of Nebraska-Lincoln South Central Agricultural Laboratory near Clay Center, NE. DeKalb corn hybrid DKC 64-83, rating of “good” (6 out of 9) for gray leaf spot (GLS), “very good” (4 out of 9) for common rust (CR), and “good” (5 out of 9) for southern rust (SR), was planted on 26 Apr in 30-in. rows at a target population of 30,600 plants/A. The trial area was disked with soybean as the previous year’s crop. Five foliar fungicide 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 Jul at reproductive stage R1. Although foliar disease was observed at very low severity throughout the growing season, GLS, CR, and SR severity was visually assessed by estimating percent leaf area covered with lesions over the entire plot on 6 Jul (R1), 3 Aug (R4), and 17 Aug (R5.33), and these data were used to calculate area under the disease progress curve (AUDPC). Grain was mechanically harvested with a two-row research combine on 28 Sep. 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. Disease severity and yield were measured in the two center rows of each plot. Trial data was analyzed in SAS using the Waller-Duncan K-ratio t Test at the $P=0.05$ significance level. Monthly rainfall and temperature readings were atypical during the growing season. High temperatures reached in the upper 90’s to low 100’s during the summer growing season, notably in Jul around the VT/R1 growth stage. The research farm received little to no precipitation during much of the growing season but supplemental water was added as needed by an overhead sprinkler linear irrigation system.

Common rust was the initial foliar disease observed in this trial, first seen on the 6 Jul assessment date. GLS and SR were both first observed in this trial on the 3 Aug assessment date. GLS, CR, and SR severity remained low through the entire growing season and no severity assessment exceeded 1.0% for any treatment on any rating date. GLS lesions were identified on the ear leaf by early- to mid-August. Common smut and Physoderma brown spot were observed sparsely through this trial and their severity was not assessed. The AUDPC calculations indicated that the fungicide treatments containing Headline 2.09 EC, in general, reduced GLS, CR, SR severity compared to other treatments. 500-count kernel weights ranged from 6.52 oz for the non-treated control to 6.63 oz for Headline 2.09 EC, 9 fl oz/A. There were no significant differences among treatments for 500-count kernel weights. Grain moisture at harvest ranged from 14.9% to 15.1%. Regalia Maxx, 8 fl oz/A, was the lowest yielding treatment at 271.3 bu/A while the non-treated control, Headline 2.09 EC, 6 fl oz/A, and Headline EC 2.09 EC, 6 fl oz + Regalia Maxx, 4 fl oz were the highest yielding treatments at 276.2 bu/A. There were no significant differences in yield among all treatments.

Treatment and Rate/A	GLS AUDPC ^z	CR AUDPC	SR AUDPC	500 Kernel Weight (oz)	Grain Moisture (%)	Yield (bu/A) ^y
Non-Treated Control.....	10.8 a ^x	5.1	4.5 b	6.52	14.9	276.2
Regalia Maxx ^w , 4 fl oz.....	10.5 a	5.1	8.1 a	6.57	14.9	274.7
Regalia Maxx ^w , 8 fl oz.....	10.2 a	4.9	4.1 bc	6.57	14.9	271.3
Headline 2.09 EC ^w , 6 fl oz.....	7.3 b	4.7	0.9 c	6.54	15.0	276.2
Headline 2.09 EC ^w , 9 fl oz.....	6.8 b	4.4	1.1 c	6.63	15.1	275.0
Headline 2.09 EC ^w , 6 fl oz + Regalia Maxx ^w , 4 fl oz.....	6.8 b	4.6	0.9 c	6.58	15.0	276.2
Coefficient of Variation (%)	26.2	11.3	86.0	1.4	1.9	2.8

^zArea under the disease progress curve.

^yYield calculations adjusted to a moisture content of 15.5%.

^xData 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.

^wTreatment included non-ionic surfactant (NIS), 0.25% V/V.