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Application Timing on Foliar Fungicide Efficacy on Sorghum in Nebraska, 2009

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SORGHUM (*Sorghum bicolor* (L.) Moench 'NC+ 7R83')
Rust; *Puccinia purpurea*

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A foliar fungicide efficacy trial was established at the University of Nebraska-Lincoln South Central Agricultural Laboratory near Clay Center, NE. Grain sorghum hybrid NC+ 7R83 was planted on 18 May in 30-in. rows with a target population of 90,000 plants/A. The trial area was disked with a crop history of five years of continuous corn. Eight 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 2.5 mph resulting in a 20 gal/A application volume. Foliar fungicides were applied on 3 Aug (boot stage) and 10 Aug (flowering stage). Disease severity was visually assessed by estimating percent leaf area covered with lesions over the entire plot on 13 Aug (flowering), 26 Aug (soft dough), and 10 Sep (hard dough) and these data were used to calculate area under the disease progress curve (AUDPC). Stay green was visually estimated on 14 Oct 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 30 Nov. 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. Monthly rainfall levels were normal through most of the growing season except for below normal levels in May, Jul, and Sep. Supplemental water was added as needed by an overhead sprinkler linear irrigation system. Temperatures were below normal for majority of the growing season.

Disease severity was very low in this trial location for the 2009 season. Rust was the primary foliar fungal disease in this trial prominent enough to rate during the season. Rust was first observed on 26 Aug in trace amounts and remained low throughout the growing season. Rust severity did not exceed 0.1% in any treatment on any rating date. Utilizing all disease ratings in the AUDPC calculation indicated no significant differences in rust AUDPC and that all fungicide treatments, except Quilt 1.66 SC, 10.5 fl oz at flowering, reduced rust severity compared to the non-treated control. There were no significant differences in stay green. Stay green percentages ranged from 62.5% to 66.1%. There were no significant differences in 1,000-count kernel weights. 1,000-count kernel weights ranged from 0.92 oz (Quadris 2.08 SC, 6 fl oz at boot) to 0.99 oz (Quilt 1.66 SC, 10.5 fl oz at boot). There were no significant differences in grain moisture at harvest. Grain moisture ranged from 16.2% to 16.4%. There were no significant differences in yield among all treatments. Yields ranged from 142.7 bu/A (non-treated control) to 154.7 bu/A (Quilt 1.66 SC, 10.5 fl oz at boot). Data were analyzed using the Waller-Duncan k-ratio t Test ($P > 0.05$).

Treatment, Rate/A, Application Growth Stage	Rust AUDPC[z]	Stay Green (%)[y]	1,000 Kernel Weight (oz)	Grain Moisture (%)	Dry Yield (bu/A)[x]
Non-Treated Control……..……...….	0.9[w]	62.5[w]	0.94[w]	16.3[w]	142.7[w]
Quadris 2.08 SC, 6 fl oz[v], Boot……..……	0.7	64.3	0.92	16.4	147.8
Quilt 1.66 SC, 10.5 fl oz[v], Boot……..….	0.8	62.5	0.99	16.3	154.7
Quilt Xcel 2.2 SE, 10.5 fl oz[v], Boot…….....	0.4	62.5	0.96	16.3	152.4
Quilt Xcel 2.2 SE, 14 fl oz[v], Boot……..….....	0.5	64.3	0.95	16.3	148.6
Quadris 2.08 SC, 6 fl oz[v], Flowering.....….	0.7	62.5	0.95	16.2	146.6
Quilt 1.66 SC, 10.5 fl oz[v], Flowering…….	1.3	66.1	0.96	16.3	151.2
Quilt Xcel 2.2 SE, 10.5 fl oz[v], Flowering……..	0.8	65.5	0.94	16.2	146.8
Quilt Xcel 2.2 SE, 14 fl oz[v], Flowering…….....	0.8	64.9	0.95	16.2	149.2
Coefficient of Variation (%)	88.2	5.2	4.8	1.0	7.8

[z]Area under the disease progress curve.
[y]Stay green was estimated as the percentage of green leaves remaining on the plant.
[x]Yield calculations adjusted to a moisture content of 14.0%.
[w]All data assessments were not statistically different ($P > 0.05$) according to the Waller-Duncan k-ratio t Test.
[v]Treatment included COC, 1.0%V/V