

Field evaluation of fungicides for management of anthracnose on lentils

Nesson Valley / Hofflund – approx. 30 miles east of Williston, ND (2013)

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KEY FINDINGS:

- Under a mixture of anthracnose and Sclerotinia disease pressure, the registered fungicides Headline (6 fl oz/ac) and Priaxor (4 fl oz/ac) and the experimental fungicides Bravo Top (2 pt/ac) and Omega (0.85 pt/ac) performed well.
- Omega exhibited a rate response, with anthracnose control increasing as the application rate increased.
- Endura (6 oz/ac) and Inspire (4 fl oz/ac) provided poor control of anthracnose in this field trial. Aproach (12 fl oz/ac), Proline (5 fl oz/ac), and Quadris (6.2 fl oz/ac) exhibited moderate efficacy intermediate between the non-treated control and the best treatments.

Active ingredients: Aproach contains 250 g picoxystrobin per liter, Bravo Top contains 50 g difenoconazole + 500 g chlorothalonil per liter, Endura contains 700 g boscalid per kilogram, Headline contains 250 g pyraclostrobin per liter, Inspire contains 250 g difenoconazole per liter, Omega contains 500 g fluazinam per liter, Priaxor contains 333 g pyraclostrobin + 167 g fluxapyroxad per liter, Proline contains 480 g prothioconazole per liter, Quadris contains 250 g azoxystrobin per liter, Xemium contains 300 g fluxapyroxad per liter.

SUMMARY OF KEY RESULTS:

Within-column means followed by different letters are significantly different ($P < 0.05$; Tukey multiple comparison procedure).

Fungicide application timing:

A = July 3 (just prior to canopy closure)

B = July 16

Fungicides were applied with 8002VS flat-fan nozzles at 40 psi in 20 gallons of water/ac.

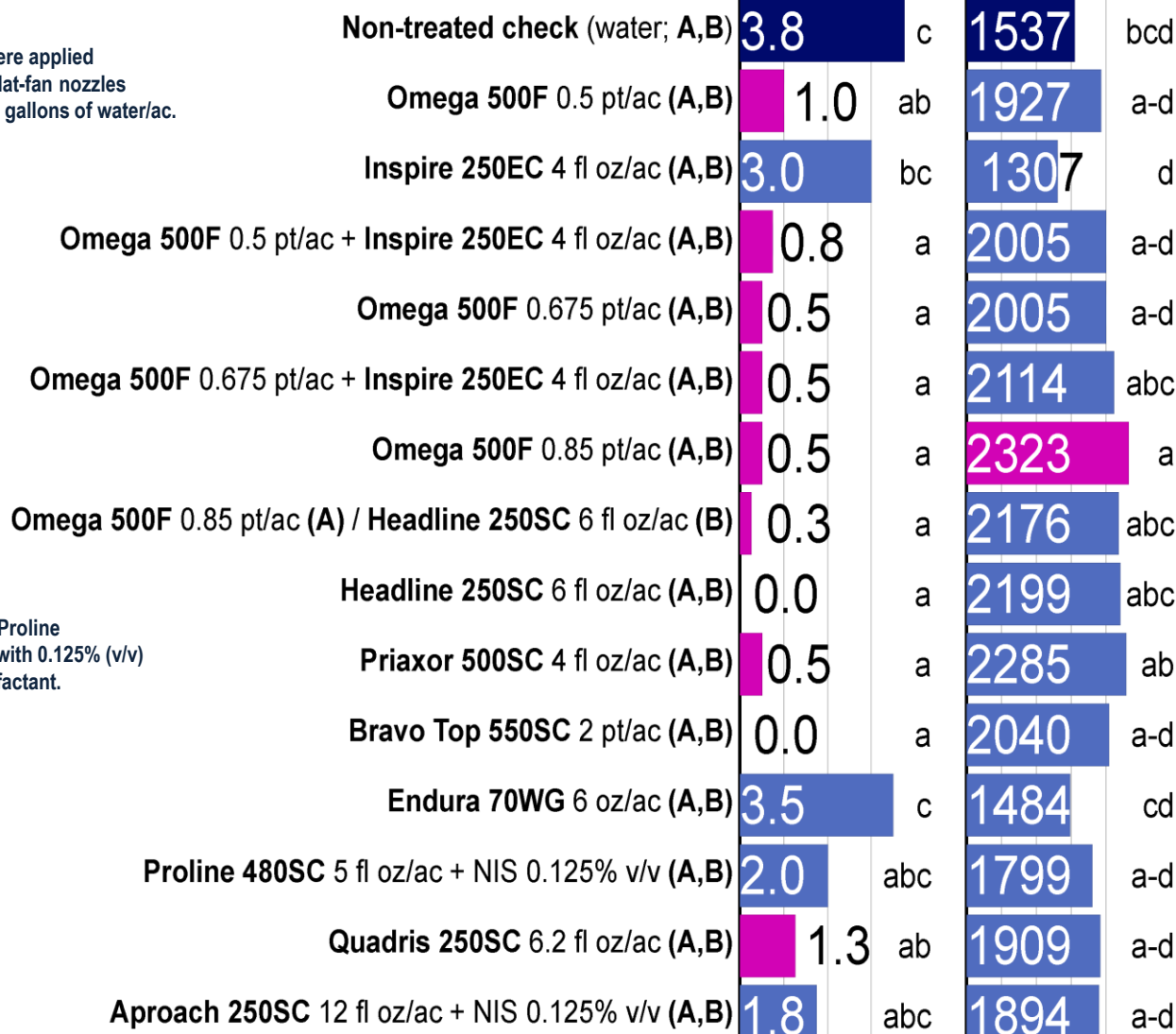
Aproach and Proline were applied with 0.125% (v/v) non-ionic surfactant.

Anthracnose Yield severity

(0 to 5 scale)

August 12

pounds per acre



$P > F$: < 0.0001
CV: 66.0

$P > F$: 0.0006
CV: 15.2

The fungicides INSPIRE, BRAVO TOP, and OMEGA are currently not registered for use on lentils and should not be used. Future registration of some of these fungicides is anticipated. Results are provided for reference only.

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- **Location of trial:** NDSU Williston Research Extension Center, Nesson Valley Irrigation Research Site
- **GPS coordinates of research trial location:** 48.167,-103.104
- **Tillage:** conventional **Soil type:** Lihen - fine sandy loam **Previous crop:** durum wheat
- **Variety:** 'CDC Richlea'
- **Seed treatment:** Seeds were treated with 1.6 fl oz/cwt Axxess (imidacloprid) insecticide + 0.4 fl oz/ac Stamina (pyraclostrobin) fungicide.
- **Experimental design:** randomized complete block **Replicates:** 4
- **Seeded plot size:** 5 ft (center-to-center) x 18 ft long **Harvested plot size:** 5 ft (center-to-center) x approx. 14 ft long
- **Untreated buffer plots were established between treatment plots.**
- **Row spacing:** 7.5 inches **Rows per plot:** 7
- **Planting date:** May 6, 2013
- **Seeding rate:** 18 pure live seeds/square foot
- **Fungicide application A:** July 3, 2013 just prior to canopy closure; lentils at 16 nodes.
- **Fungicide application B:** July 16 at 1:00 to 2:30 pm; air temperature = 64 to 65°F, relative humidity = 76 to 80%, wind = 10 to 12.5 mph out of the north
- **Fungicide application details:** Fungicides were applied with a 57-inch hand boom equipped with four equally spaced Spraying Systems TeeJet 8002VS flat-fan nozzles at a spray volume of 20 gal water/A operated at 40 psi.
- **Disease establishment:** Anthracnose-infested lentil residues collected in the 2012 field season were spread in the non-treated buffer and guard plots on July 10 and overhead irrigation was applied during the bloom and early pod set growth stages.
- **Anthracnose disease assessment:** The severity of anthracnose stem lesions was assessed on Aug. 12 at late pod-fill using a 0 to 5 scale, in which 0 = anthracnose lesions on stems and leaves at zero to trace levels, lower canopy green; 1 = an average of one to three anthracnose stem lesions per plant, lower canopy green; 2 = an average of four to five anthracnose stem lesions per plant, lower canopy green; 3 = an average of five or more anthracnose stem lesions per plant and the bottom 1 to 25% of the lentil canopy necrotic; 4 = an average of ten or more anthracnose stem lesions per plant and the bottom 25 to 50% of the lentil canopy necrotic; and 5 = an average of ten or more anthracnose stem lesions per plant and more than 50% of the internal lentil canopy necrotic. The severity of anthracnose-related canopy necrosis was assessed on Aug. 12 at late pod-fill as the percentage of the plot exhibiting plants killed by anthracnose.
- **Date that lentils were desiccated:** This trial was desiccated on August 29 with paraquat (2 pts/ac Gramoxone + 3 oz/ac non-ionic surfactant applied in 15 gallons of water/ac).
- **Harvest date:** September 6, 2013
- **Statistical analysis:** Data were evaluated with analysis of variance. The assumption of constant variance was assessed by plotting residuals against predicted values, and the assumption of normality was assessed with a normal probability plot. To meet model assumptions, a systematic natural-log transformation was applied to the anthracnose canopy necrosis data and the Sclerotinia stem rot data. All other data met model assumptions. Single-degree-of-freedom contrasts were performed for all pairwise comparisons of isolates; to control the Type I error rate at the level of the experiment, the Tukey multiple comparison procedure was employed. Analyses were conducted with replicate and treatment as main factor effects, and they were implemented in PROC GLM of SAS (version 9.2; SAS Institute, Cary, NC).

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We gratefully acknowledge **BASF** for donating the seed treatment products Axxess and Stamina used in this trial.

IMPORTANT NOTICE:

- Fungicide performance can differ in response to which diseases are present, levels of disease when products are applied, environmental conditions, plant architecture and the susceptibility to disease of the variety planted, crop growth stage at the time of fungicide application, and other factors.
- This report summarizes fungicide performance as tested at the NDSU Carrington Research Extension Center under the conditions partially summarized in the methods section (above).
- Fungicide efficacy may differ under other conditions; when choosing fungicides, always evaluate results from multiple trials.
- This report is shared for educational purposes and is not an endorsement of any specific products.