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Field evaluation of fungicides for management of anthracnose on lentils

Hofflund / Nesson Valley, ND – 25 miles east of Williston (2012)

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KEY FINDINGS:

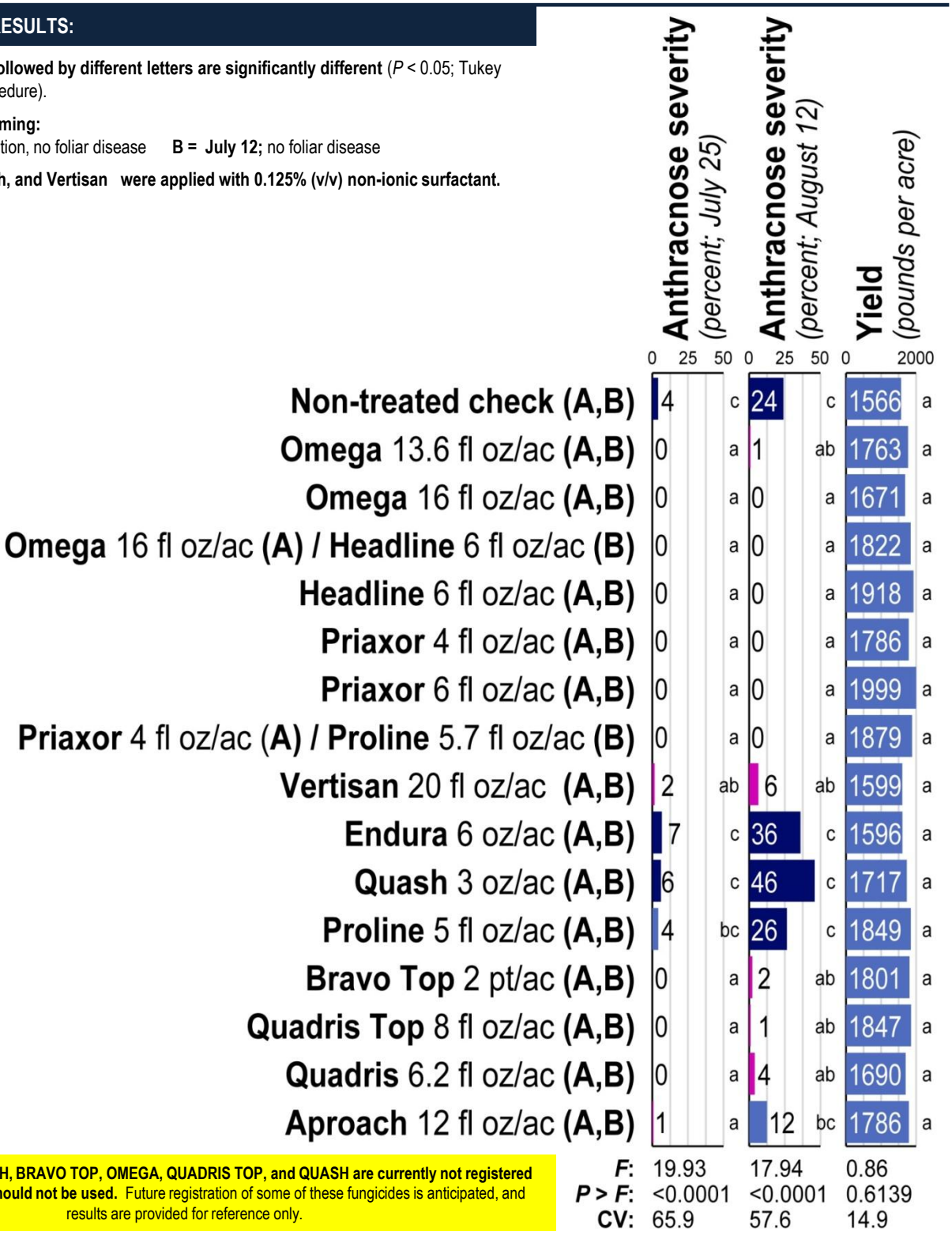
- **Under moderate anthracnose pressure, the fungicides Bravo Top** (difenoconazole + chlorothalonil), **Headline** (pyraclostrobin), **Priaxor** (pyraclostrobin + fluxapyroxad), **Quadris** (azoxystrobin), **Quadris Top** (azoxystrobin + chlorothalonil), **and Omega** (fluazinam) **performed well.**
- **When anthracnose develops late in crop development, the impact of the disease on yield is limited.** Anthracnose did not being developing in this trial until the end of bloom, and it did not reach moderate to high levels in the non-treated control until late pod-fill.
- **Under moderate anthracnose pressure, sequential applications of Endura** (boscalid), **Proline** (prothioconazole), **and Quash** (metconazole) **provided poor control of anthracnose.**

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 = June 28; bloom initiation, no foliar disease **B = July 12;** no foliar disease

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



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

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METHODS:

- **Location of trial:** NDSU Williston Research Extension Center, Nesson Valley Irrigation Research Site
- **GPS coordinates of research trial location:** 48.1667,-103.1039
- **Soil type:** Lihen - fine sandy loam
- **Variety:** CDC 'Richlea' (a medium-green lentil)
- **Soil preparation:** fall - disked once, ripped twice, and mulched once; spring - harrowed once with a noble spring tooth harrow
- **Seeding equipment:** double-disc seeder (plot cone seeder)
- **Experimental design:** randomized complete block **Replicates:** 4
- **Seeded plot size:** 5 feet wide (center-to-center) x 18 feet long **Harvested plot size:** 5 feet wide (center-to-center) x approx. 14 feet long
- **Row spacing:** 7 inches **Rows per plot:** 6
- **Non-treated buffer plots were established between treatment plots.**
- **Previous crop:** durum wheat **Planting date:** May 2, 2012
- **Seeding rate:** 18 pure live seeds per square foot; average stand count across plots was 12.5 plants per square foot on May 25.
- **Seed treatment:** Cruiser 5FS 1.28 fl oz/cwt + ApronMaxxRTA 5.0 fl oz/cwt + Mertect 340F 1.05 fl oz/cwt
- **Rhizobium inoculant:** "Nodulator' peat-based granular inoculant for peas and lentils (Rhizobium leguminosarum; Becker Underwood, St Joseph, MO); applied at the commercially recommended rate of 6 oz/1000 feet of row.
- **Sclerotinia control:** To reduce Sclerotinia disease pressure in this trial, Contans (a commercial formulation of the Sclerotinia mycoparasite Coniothyrium minitans) was applied to the soil at 6 lbs/ac prior to seeding the trial.
- **Fungicide application A:** June 28, 2012 at 10:00-11:00 am; less than 10% of plants with an open blossom, 18-nodes, 12-inch height; no anthracnose symptoms present; wind = 10-11 mph, temperature = 71-73˚F, relative humidity = 43-48%.
- **Fungicide application B:** July 12, 2012 at 11:00 am to 12:00 p; average plant height was 12 to 14 inches; no anthracnose symptoms present; wind = 9-10 mph, temperature = 80-84˚F, relative humidity = 56-66%.
- **Fungicide application details:** Fungicides were applied with a 56-in hand boom with four equally spaced Spraying Systems TeeJet 8002VS flat-fan nozzles. Applications were made with 20 gal/ac water and 40 psi pressure.
- **Inoculation details:** To promote disease, anthracnose-infected lentil stems collected in Carrington, ND were placed in the 18-inch alley between plots on July 7. Two to four plants were placed between each plot.
- **Irrigation:** To facilitate disease establishment, overhead irrigation was applied with an overhead linear irrigation system.
- **Disease assessments:** Anthracnose was the only foliar disease to develop above trace levels in this trial. Anthracnose severity was assessed on July 25 and Aug. 12 as the percent of the plot showing symptoms of the disease.
- **Harvest date:** September 4, 2012. The lentils were desiccated on August 21, 2012 with 2 pt/ac Gramoxone (paraquate 200 g/L) + NIS (2.5 oz/ac) in 15 gallons of water/ac.
- **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 [LN(x+1) for data sets including values below 1.0] was applied to the disease severity 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 **Becker Underwood** for donating the Rhizobium inoculant used in this trial, **Syngenta Crop Protection** for donating the seed treatment products Cruiser and Mertect, and **JM Grain** for helping us obtain seed of CDC Richlea lentils for use 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 chickpea variety planted, crop growth stage at the time of fungicide application, and other factors.
- This report summarizes fungicide performance as tested at the NDSU Williston Research Extension Center's Nesson Valley Irrigation Research Site in 2012 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.