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Field evaluation of fungicides for management of anthracnose on lentils

Sykeston, ND (2012)

Michael Wunsch, plant pathologist
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KEY FINDINGS:

- **Under severe anthracnose disease pressure, the registered fungicides Headline** (pyraclostrobin), **Priaxor** (pyraclostrobin + fluxapyroxad), **and Quadris** (azoxystrobin) **performed well.**
- **The efficacy of Priaxor appeared to be derived from the pyraclostobin active ingredient.** Priaxor is a premix of pyraclostrobin and fluxapyroxad, the active ingredients in Headline and Xemium, respectively. Headline performed well in this trial, and Xemium did not.
- **When registered, Omega** (fluazinam) **and Bravo Top** (difenoconazole + chlorothalonil) **may be useful tools for managing anthracnose.**

SUMMARY OF KEY RESULTS:

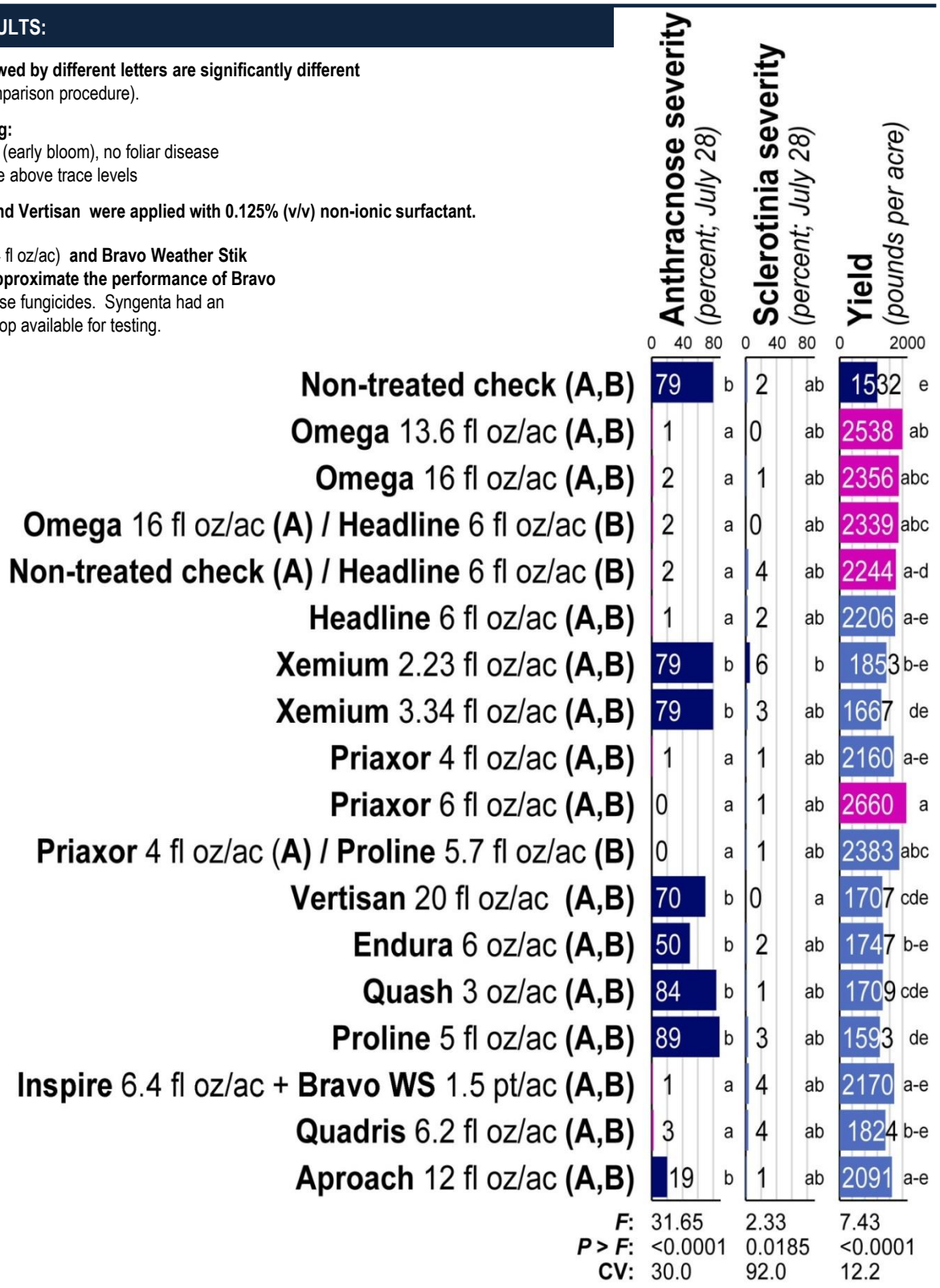
Within-column means followed by different letters are significantly different ($P < 0.05$; Tukey multiple comparison procedure).

Fungicide application timing:
A = June 29; canopy closure (early bloom), no foliar disease
B = July 11; no foliar disease above trace levels

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

The tank-mix of Inspire (6.4 fl oz/ac) **and Bravo Weather Stik** (1.4 pt/ac) **was applied to approximate the performance of Bravo Top**, which is a premix of these fungicides. Syngenta had an insufficient supply of Bravo Top available for testing.

The fungicides INSPIRE / BRAVO TOP, OMEGA, QUASH, and XEMIUM 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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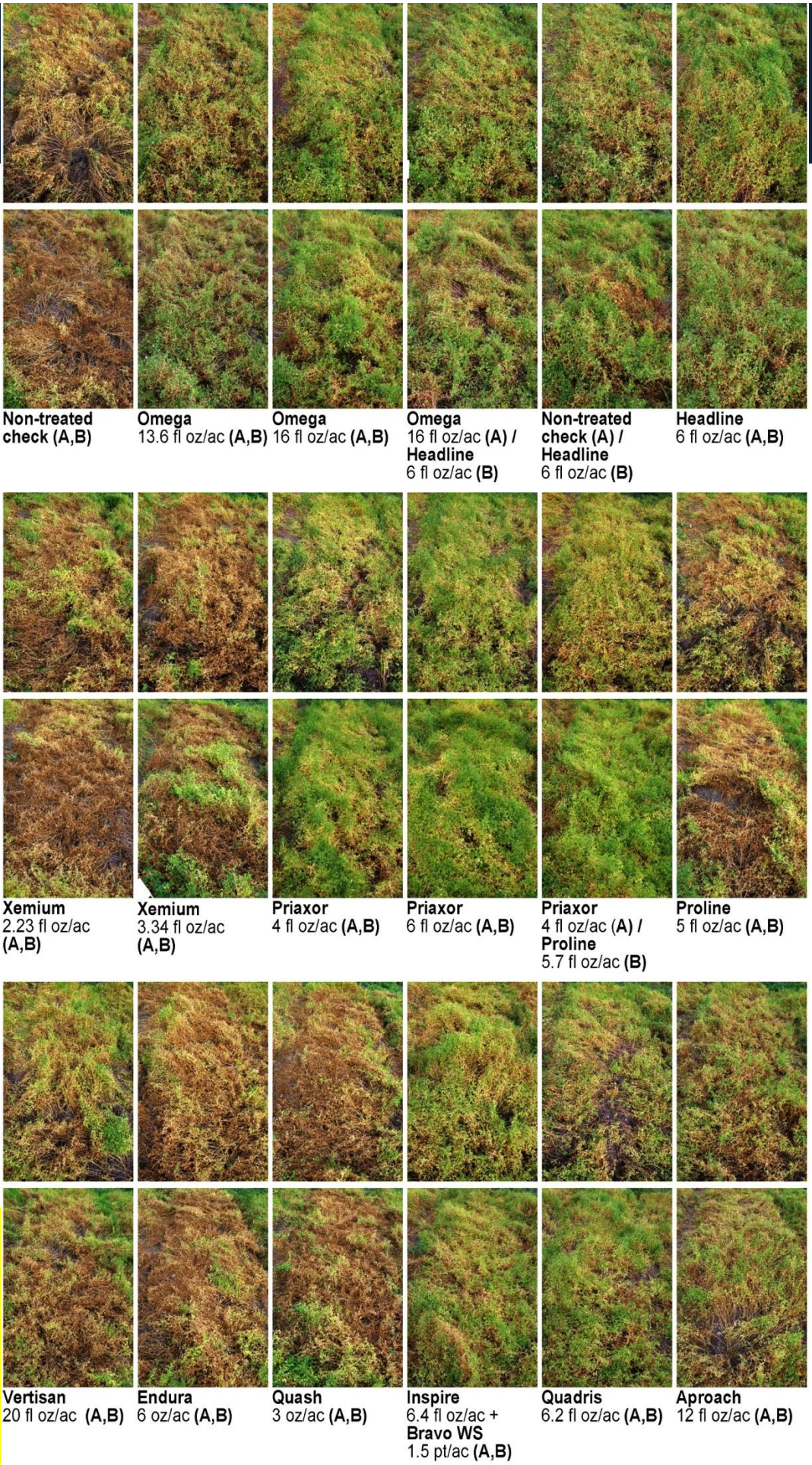

PHOTOS TAKEN ON JULY 28, 2012

Fungicide application timing:
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B = July 11; no foliar disease above trace levels

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METHODS:

- **Location of trial:** 2 miles southeast of Sykeston, ND
- **GPS coordinates of research trial location:** 47.4433,-99.3657
- **Variety:** CDC 'Richlea' (a medium-green lentil)
- **Experimental design:** randomized complete block **Replicates:** 4
- **Seeded plot size:** 5 feet wide (center-to-center) x 25 feet long
- **Harvested plot size:** 5 feet wide (center-to-center) x approx. 19 feet long
- **Row spacing:** 7 inches **Rows per plot:** 7
- **Non-treated buffer plots were established between treatment plots.**
- **Previous crop:** buckwheat
- **Planting date:** May 2, 2012
- **Seeding rate:** 18 pure live seeds per square foot
- **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.
- **Fungicide application A:** June 29, 2012 at 11:00 am - 1:00 pm; canopy closure, lentils at full bloom (approx. 8 to 10 days after bloom initiation); no foliar disease present . Wind = 4-6 mph out of the north to northwest, temperature = 78-82˚F, relative humidity = 32-43%.
- **Fungicide application B:** July 11, 2012 at 6:30-8:00 am; no foliar disease present above trace levels. Wind = 4-6 mph out of the southeast, temperature = 69-75˚F, relative humidity = 72-78%.
- **Fungicide application details:** Fungicides were applied with a 60-inch hand boom equipped with four equally spaced Spraying Systems TeeJet XR 8001VS flat-fan nozzles at a spray volume of 17.5 gal water/acre operated at 35 psi.
- **Inoculation details:** This trial was inoculated with Botrytis cinerea, cause of Botrytis gray mold, not with the pathogens causing anthracnose or Sclerotinia. However, anthracnose developed, most likely because the spray boom used to inoculate the trial and/or shoes and clothing worn in the trial were contaminated with the anthracnose pathogen. The high temperatures observed during the bloom period were favorable for anthracnose but not for Botrytis gray mold.
- **Irrigation:** To facilitate disease establishment, the trial was irrigated with rotating microsprinklers established on a 20 ft x 20 ft grid. On evenings when the trial was inoculated, 0.16 inches of water were applied; subsequent to inoculations, 0.08 inches of water were applied nightly for 4 to 5 nights.
- **Disease assessments:** Anthracnose and Scleotinia severity were assessed on July 28 as the percent of the plot exhibiting each disease.
- **Harvest date:** August 14, 2012. The trial was swathed Aug. 1.
- **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; LN(x) for data sets in which no values were 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, Tukey's 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).

WE GRATEFULLY ACKNOWLEDGE:

This project was made possible with grants from the **Northern Pulse Growers Association** and the **North Dakota Department of Agriculture Crop Protection Product Harmonization Board and Registration Board.** Supplementary financial support was provided by the **BASF Corporation** and **ISK BioSciences**.

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 by the NDSU Carrington Research Extension Center at a site near Sykeston, ND 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.