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Field evaluation of fungicides for management of Ascochyta blight on lentils

Carrington, ND (2012)

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KEY FINDINGS:

- **Under severe Ascochyta blight pressure, the fungicides Headline** (pyraclostrobin), **Priaxor** (pyraclostrobin + fluxapyroxad), **and Omega** (fluazinam) **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.
- **The strong performance of Inspire** (difenoconazole) **+ Bravo Weather Stik** (chlorothalonil) **suggests that Bravo Top** (difenoconazole + chlorothalonil) **may be a useful tool for managing Ascochyta blight.**
- **Under severe Ascochyta blight pressure, the fungicides Endura** (boscalid), **Proline** (prothioconazole), **Quadris** (azoxystrobin), **Vertisan** (penthiopyrad, **and Xemium** (fluxapyroxad) **provided unsatisfactory disease control.**

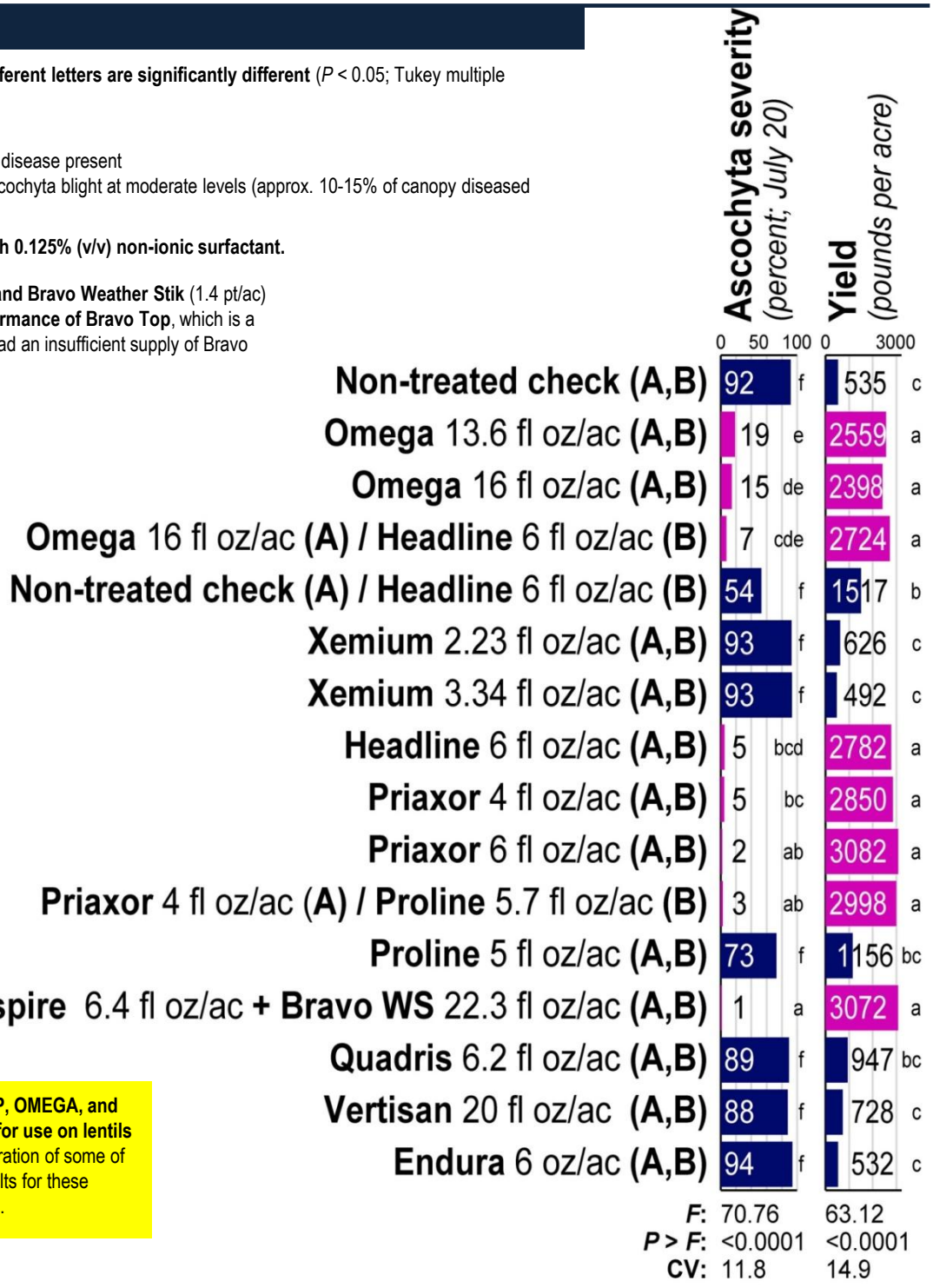
SUMMARY OF KEY RESULTS:

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

Fungicide application timing:
A = June 22; bloom initiation; no foliar disease present
B = July 5; lentils at end of bloom; Ascochyta blight at moderate levels (approx. 10-15% of canopy diseased in non-treated control)

Proline 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, 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 for these products are provided for reference only.

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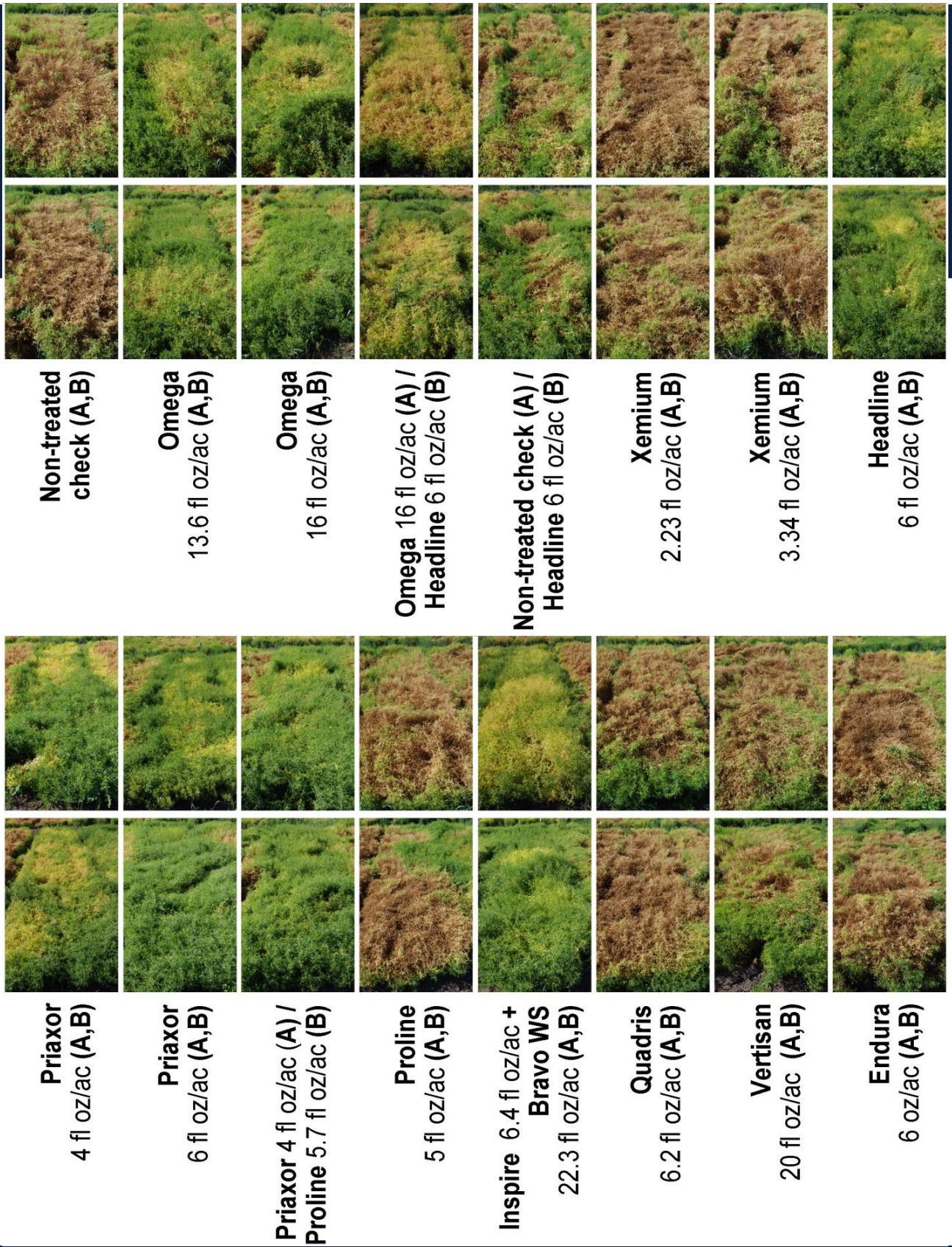

Fungicide application timing: **A = June 22;** bloom initiation; no foliar disease; **B = July 5;** 10-15% Ascochyta severity in non-treated control

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

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METHODS:

- **Location of trial:** 3 miles south of the NDSU Carrington Research Extension Center, Carrington, ND.
- **GPS coordinates of research trial location:** 47.4714,-99.1374
- **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:** spring wheat
- **Planting date:** April 23, 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 22, 2012 at 6:30-8:00 am; 90% of plants with an open blossom; no foliar disease. Wind = 4 mph out of the west, temperature = 55-64˚F, relative humidity = 72-90%.
- **Fungicide application B:** July 5, 2012 at 6:30-8:00 am; lentils at the end of bloom; Ascochyta blight at moderate levels (approx. 10 to 15% of canopy diseased) in the non-treated checks. Wind = 3-6 mph out of the north to northwest, temperature = 55-62˚F, relative humidity = 76-87%.
- **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.
- **Ascochyta inoculation details:** To promote disease, the trial was inoculated with laboratory-grown pycnidiospores of Ascochyta lentis. Spore applications were made at 20 psi with a 60-inch hand boom equipped with four equally spaced Spraying Systems TeeJet TJ60-8003 twin jet nozzles. Inoculation 1: June 26 at 9:30 pm; the spores were applied concurently with the application of overhead irrigation; a solution of 3.6 x 105 spores/ml was applied to the treatment plots at an application rate of 19.66 gal/ac (5.5 x 105 spores/sq ft). Inoculation 2: June 27 at 9:30 pm; the spores were applied concurently with the application of overhead irrigation; a solution of 2.5 x 105 spores/ml was applied to the treatment plots at an application rate of 16.95 gal/ac (3.3 x 105 spores/sq ft). Inoculation 3: June 28 at 5:30 am; the spores were applied concurently with the application of overhead irrigation; a solution of 2.5 x 105 spores/ml was applied to the treatment plots at an application rate of 27.1 gal/ac (5.0 x 105 spores/sq ft). Inoculation 4: June 28 at 10:00 pm; the spores were applied concurently with the application of overhead irrigation; a solution of 5.0 x 105 spores/ml was applied to the treatment plots at an application rate of 16.95 gal/ac (6.0 x 105 spores/sq ft). Inoculation 5: June 29 at 10:00 pm; the spores were applied concurently with the application of overhead irrigation; a solution of 5.0 x 105 spores/ml was applied to the treatment plots at an application rate of 27.1 gal/ac (1.0 x 106 spores/sq ft).
- **Disease assessments:** Ascochyta severity was evaluated on July 13 during the pod-fill period (bloom completed) and on July 20 shorty before maturity. No other foliar diseases were present above trace levels.
- **Harvest date:** August 6, 2012. The trial was swathed July 31, 2012.
- **Seed size:** Seed diameter was determined by assessing the percent (by weight) of a 200-gram seed sample that passed through sieves with round 26/64, 24/64, and 22/64-inch diameter holes.
- **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)] was applied to the Ascochyta 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:

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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 Carrington Research Extension Center 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.