Last updated: February 8, 2013

Field evaluation of fungicides for management of Sclerotinia stem rot on lentils

Carrington, ND (2012)

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KEY FINDINGS:

- **Omega** (fluazinam) **and Topsin** (thiophanate-methyl) **performed well.** Neither are currently registered on lentils.
- **Additional testing will be needed to evaluate whether fungicides currently registered on lentils provide satisfactory control of Sclerotinia stem rot**.

SUMMARY OF KEY RESULTS:

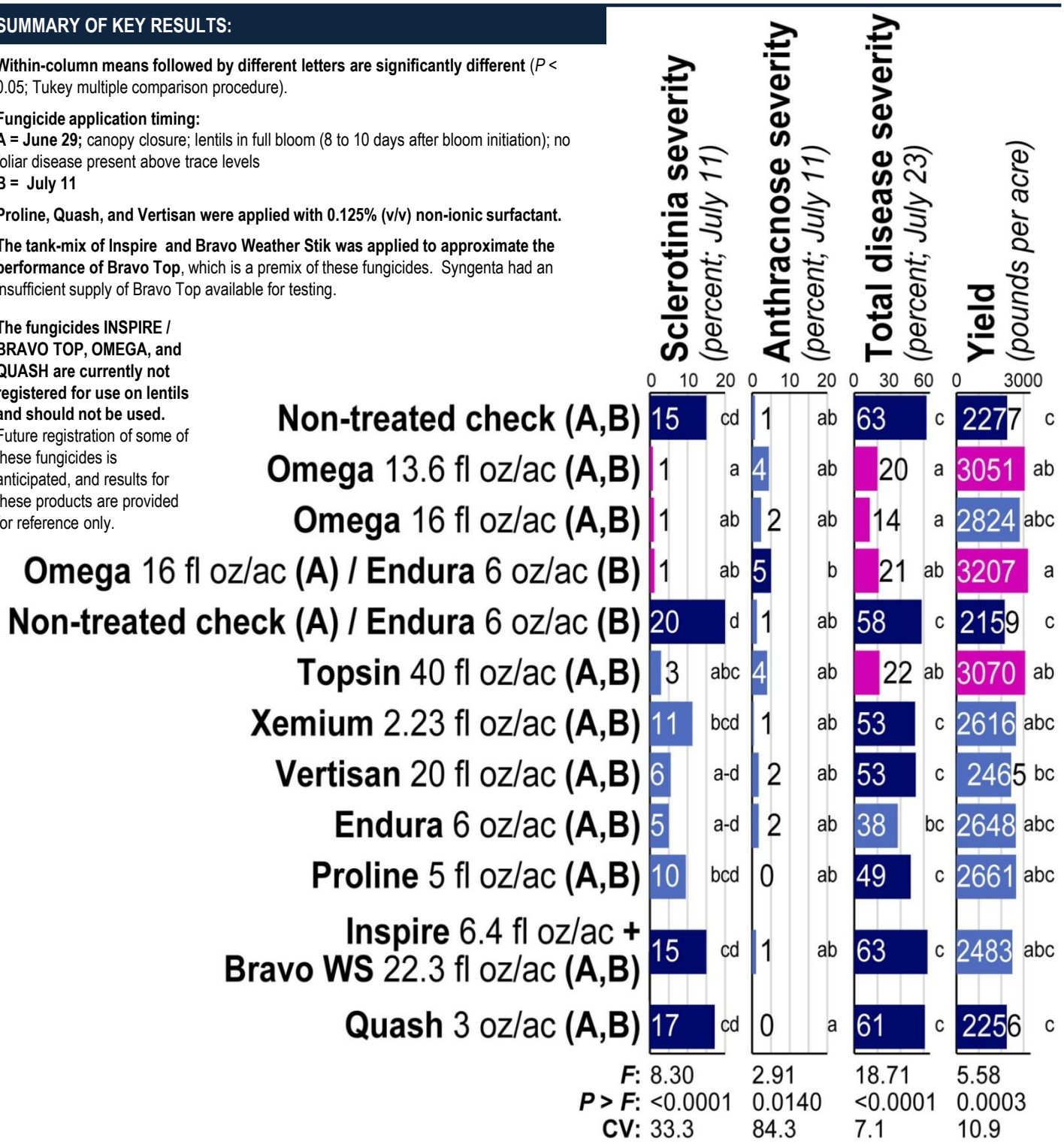
Within-column means followed by different letters are significantly different ($P < 0.05$; Tukey multiple comparison procedure).

Fungicide application timing:
A = June 29; canopy closure; lentils in full bloom (8 to 10 days after bloom initiation); no foliar disease present above trace levels
B = July 11

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

The tank-mix of Inspire and Bravo Weather Stik 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 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 for these products are provided for reference only.



TO ASSESS FUNGICIDE EFFICACY AGAINST SCLEROTINIA WHILE MINIMIZING THE COUNFOUNDING INFLUENCE OF OTHER DISEASES, the fungicide Headline (pyraclostrobin) was applied across all plots (including the non-treated control) on June 21 (bloom initiation; 6 fl oz/ac), July 3 (6 fl oz/ac), and July 12 (8 fl oz/ac). Headline has efficacy against anthracnose, Ascochyta, and other foliar diseases but not Sclerotinia.

Field evaluation of fungicides for management of anthracnose and Sclerotinia on lentils Carrington, ND (2012)

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METHODS:

- **Location of trial:** NDSU Carrington Research Extension Center, Carrington, ND.
- **GPS coordinates of research trial location:** 47.510302,-99.132842
- **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:** soybean
- **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 7:00 - 8:00 am; canopy closure, lentils at full bloom (approx. 8 to 10 days after bloom initiation); no foliar disease present. Wind = 3-6 mph out of the west, temperature = 62-68˚F, relative humidity = 66-82%.
- **Fungicide application B:** July 11, 2012 at 6:00-7:30 am; see disease ratings for disease levels. Wind = 4-6 mph out of the southeast, temperature = 69-73˚F, relative humidity = 75-78%.
- **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.
- **Sclerotinia inoculation details:** Sclerotia (resting structures) of *Sclerotinia sclerotiorum*, causal agent of Sclerotinia stem rot, were distributed across the trial in May 2011 (one year prior to seeding), and additional overwintered sclerotia were distributed across the trial on April 23, 2012 (immediately prior to seeding; 0.0874 grams of sclerotia per square foot). The trial was also inoculated with laboratory-produced ascospores of S. sclerotiorum on July 4 at 1:00 to 2:00 am. Spores were applied with a 60-inch hand boom with four equally spaced 8003 twinjet nozzles at a spray volume of 26 gallons/ac and operated at 20 psi. The spore concentration utilized was 2,000 spores/ml, and 3,250 spores were applied per square foot.
- **TO PERMIT THE ASSESSMENT OF FUNGICIDE EFFICACY AGAINST SCLEROTINIA WITHOUT THE CONFOUNDING INFLUENCE OF OTHER DISEASES,** anthracnose and Ascochyta were controlled with Headline. Headline, which does not have efficacy against Sclerotinia, was applied across all plots (including the non-treated control) on June 21 (bloom initiation; 6 fl oz/ac), July 3 (6 fl oz/ac), and July 12 (8 fl oz/ac).
- **Disease assessments:** Anthracnose and Scleotinia severity were assessed on July 11 as the percent of the plot exhibiting each disease. When the second disease assessment was conducted on July 23, anthracnose and Sclerotinia had caused considerable plant mortality, and it was no longer possible to accurately assign the cause of mortality to either disease. As a consequence, only total necrosis (caused by a combination of anthracnose and Sclerotinia) was recorded on July 23.
- **Irrigation:** To facilitate disease establishment, overhead irrigation was applied with a center pivot during bloom.
- **Harvest date:** August 6, 2012. The trial was swathed July 31, 2012.
- **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 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.