

Field evaluation of fungicides for management of *Ascochyta* blight on chickpeas

Carrington, ND (2010)

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KEY FINDINGS:

- **Proline** (5.0 or 5.7 fl oz/ac), **Endura** (6 oz/ac), and **ProPulse** (8.6 or 10.3 fl oz/ac) provided excellent control of *Ascochyta* blight. No differences in efficacy were observed among these products.
- Under the conditions tested in this trial (first application made shortly before bloom, when the canopy was open, and fairly dry weather at early bloom), chlorothalonil (applied as Echo 720 at 1.4 pt/ac) showed excellent efficacy against *Ascochyta* blight when applied as the first application in a fungicide resistance management program. The performance of the protectant fungicide chlorothalonil will likely be lower when the canopy is closed (and fungicide coverage is reduced) and/or the weather is more conducive for disease.
- Rotational strategies with Proline (5.0 fl oz/ac) or ProPulse (8.6 fl oz/ac) and Endura (6 oz/ac) performed equivalently to sequential applications of Proline or ProPulse.

SUMMARY OF KEY RESULTS:

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

Fungicides were applied at 35 psi in 17.5 gallons of water per acre with 8002 twin-jet nozzles.

Fungicide applications:

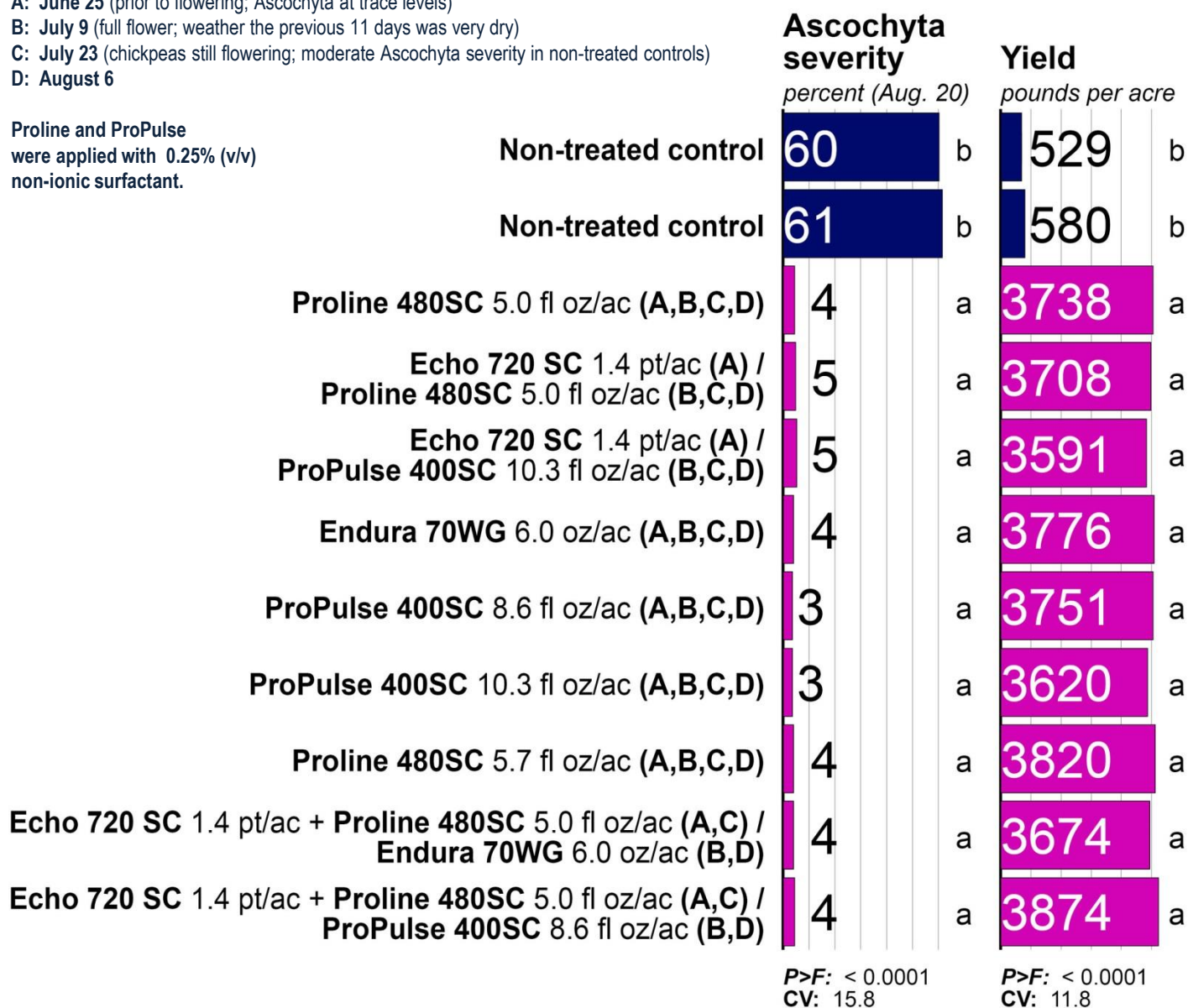
A: June 25 (prior to flowering; *Ascochyta* at trace levels)

B: July 9 (full flower; weather the previous 11 days was very dry)

C: July 23 (chickpeas still flowering; moderate *Ascochyta* severity in non-treated controls)

D: August 6

Proline and ProPulse were applied with 0.25% (v/v) non-ionic surfactant.



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METHODS:

- **Experimental design, seeding, planting, and harvest:** The experiment was a randomized complete block design with four replicates. Plots were seeded May 18 and harvested September 27. The medium-kabuli chickpea 'Sierra' was seeded in 7-inch rows with a target planting density of 4 plants per square foot. Plots consisted of seven rows, each 25 ft long, with an 18-inch alley between plots (plot size, including alley = 5 feet by 25 feet). Buffer plots were established between treatment plots in order to minimize spray drift between treatments; in the buffer plots, a desi-type chickpea less susceptible to Ascochyta blight was planted. Plot ends were trimmed prior to harvest. After harvest, seed moisture content was determined for each plot, and seed yield and test weight were adjusted to 13% moisture.
- **Fungicide applications:** Fungicides were applied June 25 between 3:30 and 4:00 pm at first appearance of disease symptoms and prior to flowering (June 25 was the first day that Ascochyta symptoms appeared in the fungicide trial but Ascochyta developed earlier in an adjacent chickpea nursery and disease was more developed in that nursery), July 9 between 1:30 and 2:15 pm during full flower (note that weather during the past 11 days had been extremely dry), July 23 between 10:45 and 11:40 am (chickpeas still flowering; weather the past 14 days was a mix of wetter and dry conditions; Ascochyta disease symptoms were becoming more significant; checks had nearly 100% incidence, though severity was still moderate), and August 6 between 9:30 and 10:20 am. A 60-in. hand boom with four equally spaced TeeJet 8002 (twin-jet) nozzles was used for applications. Applications were made with 17.5 gal/ac water and 35 PSI pressure.
- **Inoculation:** The plots were not artificially inoculated.
- **Disease assessment:** Disease incidence and disease severity (the percent of plant canopy necrotic) were evaluated August 6 and August 20. Ascochyta blight, caused by *Ascochyta rabiei*, was the only disease present.
- **Statistical analysis:** Disease incidence and severity, seed yield, and seed quality were evaluated with analysis of variance. Seed moisture levels were evaluated for harvested seed from each plot, and yields and test weights were adjusted to 13.0% moisture. 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. The assumptions were not met for the percent of seeds with diameters greater than 10 mm and less than 7 mm; to meet model assumptions, a systematic square-root transformation was applied to the dataset of seed diameters greater than 10 mm, and a systematic cube-root transformation was applied to the dataset of seed diameters less than 7 mm. No systematic transformations were applied to the other data. Single-degree-of-freedom contrasts were performed for all pairwise combinations 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 with interactions included in the model, and they were implemented in PROC GLM of SAS (version 9.2; SAS Institute, Cary, NC).

ACTIVE INGREDIENTS OF FUNGICIDES EVALUATED IN THIS TRIAL:

Echo 720: 720 grams chlorothalonil per liter

Endura: 700 grams boscalid per kilogram

Proline: 480 grams prothioconazole per liter

ProPulse: 200 grams prothioconazole + 200 grams fluopyram per liter

FUNDING:

This study was funded by **Bayer CropScience**.

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 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.