

# Field evaluation of fungicides for management of Ascochyta blight of chickpeas

Minot, ND (2012)

Last updated: February 8, 2013

Shana Pederson, Extension Area Agronomist, NDSU North Central Research Extension Center, Minot

Michael Wunsch, Plant Pathologist, NDSU Carrington Research Extension Center

701-652-2951 / michael.wunsch@ndsu.edu

## KEY FINDINGS:

**Fungicide efficacy could not be assessed in this trial.** Due to hot, dry weather, Ascochyta blight did not develop.

## FULL RESULTS:

Treatment (application timing) <sup>x</sup>	Ascochyta Severity <sup>z</sup> July 25 <sup>y</sup>	Test weight	Seed diameter <sup>w</sup>				Yield
	percent	lbs/bu	> 10.3 mm percent	9.5-10.3 mm percent	8.7-9.5 mm percent	< 8.7 mm percent	lbs/ac
1 Non-treated check (water; A,B,C)	0	61.0 a*	0.0 a*	9 ab *	48 a*	43 a*	2435 a*
2 Priaxor 500SC 4 fl oz/ac (A,B,C)	0	61.5 a	0.5 a	13 ab	48 a	38 a	2066 a
3 Priaxor 500SC 6 fl oz/ac (A,B,C)	0	58.1 a	0.1 a	7 ab	47 a	46 a	2247 a
4 Proline 480SC 5.7 fl oz/ac + NIS 0.125% v/v (A,B,C)	0	60.6 a	0.0 a	7 a	49 a	44 a	2254 a
5 Omega 500F 13.6 fl oz/ac (A,B,C)	0	60.7 a	0.0 a	11 ab	46 a	43 a	2110 a
6 Omega 500F 8 fl oz/ac (A) / Priaxor 500SC 4 fl oz/ac (B) / Proline 480SC 5.7 fl oz/ac + NIS 0.125% v/v (C)	0	61.1 a	0.0 a	10 ab	52 a	37 a	2554 a
7 Omega 500F 13.6 fl oz/ac (A) / Priaxor 500SC 4 fl oz/ac (B) / Proline 480SC 5.7 fl oz/ac + NIS 0.125% v/v (C)	0	60.7 a	0.0 a	11 ab	47 a	42 a	1909 a
8 Omega 500F 16 fl oz/ac (A) / Priaxor 500SC 4 fl oz/ac (B) / Proline 480SC 5.7 fl oz/ac + NIS 0.125% v/v (C)	0	58.9 a	0.1 a	9 ab	41 a	51 a	1681 a
9 Bravo WS 1.5 pt/ac (A) / Priaxor 500SC 4 fl oz/ac (B) / Proline 480SC 5.7 fl oz/ac + NIS 0.125% v/v (C)	0	60.3 a	0.1 a	9 ab	49 a	43 a	2600 a
10 Non-treated check water (A) / Priaxor 500SC 4 fl oz/ac (B) / Proline 480SC 5.7 fl oz/ac + NIS 0.125% v/v (C)	0	60.5 a	0.3 a	8 ab	46 a	47 a	2119 a
11 Omega 500F 13.6 fl oz/ac (A,B) / Priaxor 500SC 4 fl oz/ac (C)	0	60.9 a	0.2 a	8 ab	49 a	43 a	2115 a
12 Non-treated check water (A,B) / Priaxor 500SC 4 fl oz/ac (C)	0	59.3 a	0.0 a	8 ab	45 a	48 a	2134 a
13 Proline 480SC 5.7 fl oz/ac + NIS 0.125% v/v (A,C) / Priaxor 500SC 4 fl oz/ac (B)	0	62.1 a	0.3 a	12 ab	50 a	38 a	2337 a
14 Proline 480SC 5.7 fl oz/ac + NIS 0.125% v/v (A,C) / Priaxor 500SC 6 fl oz/ac (B)	0	58.8 a	0.3 a	8 ab	48 a	44 a	2602 a
15 Priaxor 500SC 4 fl oz/ac (A,C) / Proline 480SC 5.7 fl oz/ac + NIS 0.125% v/v (B)	0	60.7 a	0.0 a	7 ab	45 a	48 a	2083 a
16 Priaxor 500SC 6 fl oz/ac (A,C) / Proline 480SC 5.7 fl oz/ac + NIS 0.125% v/v (B)	0	59.1 a	0.2 a	17 b	49 a	36 a	2507 a
17 Priaxor 500SC 4 fl oz/ac (A,C) / Bravo Top 4.59SC 2 pt/ac (B)	0	61.4 a	0.0 a	6 a	44 a	51 a	2406 a
18 Bravo Top 4.59SC 2 pt/ac (A,C) / Priaxor 500SC 4 fl oz/ac (B)	0	60.6 a	0.0 a	7 ab	44 a	49 a	2220 a
19 Proline 480SC 5.7 fl oz/ac + NIS 0.125% v/v (A,C) / Vertisan 1.67EC 20 fl oz/ac + NIS 0.25% v/v (B)	0	60.4 a	0.0 a	8 ab	47 a	45 a	2278 a
20 Vertisan 1.67EC 20 fl oz/ac + NIS 0.25% v/v (A,C) / Proline 480SC 5.7 fl oz/ac + NIS 0.125% v/v (B)	0	61.9 a	0.0 a	8 ab	43 a	49 a	2042 a
21 Proline 480SC 5.7 fl oz/ac + Bravo WS 1.5 pt/ac + NIS 0.125% v/v (A,C) / Priaxor 500SC 4 fl oz/ac (B)	0	60.0 a	0.3 a	13 ab	53 a	34 a	2656 a
22 Quash 50WDG 3 oz/ac + NIS 0.25% v/v (A,C) / Priaxor 500SC 4 fl oz/ac (B)	0	58.8 a	0.1 a	8 ab	45 a	47 a	2401 a
	F:	0.88	0.90	2.03	0.85	1.23	1.25
	P > F:	0.6197	0.5886	0.0262	0.6433	0.2799	0.2622
	CV:	3.8	246.6	38.0	12.4	18.7	18.8

<sup>z</sup> Ascochyta disease severity: Percent of the canopy exhibiting symptoms of Ascochyta. <sup>y</sup> The chickpeas were at the end of bloom on July 25.

<sup>x</sup> Fungicide application timing:

**Application A:** June 29, 2012 at 10:15 to 11:30 am. Chickpeas at 10% bloom (10% of plants with an open blossom) and 75% canopy closure; no Ascochyta present. Wind = 4 mph, temperature = 73-76°F, relative humidity = 47-53%.

**Application B:** July 10, 2012 at 8:30 to 9:45 am. Chickpeas in full bloom; canopy 95-100% closed. Wind = 4.9-5.4 mph, temperature = 69-75°F, relative humidity = 72-79%.

**Application C:** July 24, 2012 at 8:30 to 10:00 am. Chickpeas at end of bloom (80-90% of plants with blossoms remaining). Wind = 4 to 9 mph, temperature = 65-72°F, relative humidity = 74-90%.

<sup>w</sup> Seed size: Seed size 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. \* Within-column means followed by different letters are significantly different ( $P < 0.05$ ; Tukey multiple comparison procedure).

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

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

Minot, ND (2012)

Shana Pederson, Extension Area Agronomist, NDSU North Central Research Extension Center, Minot

Michael Wunsch, Plant Pathologist, NDSU Carrington Research Extension Center

701-652-2951 / michael.wunsch@ndsu.edu

## METHODS:

- **Location of trial:** NDSU North Central Research Extension Center, Minot, ND.
- **GPS coordinates of research trial location:** 48.1812, -101.3046
- **Variety:** CDC 'Frontier'
- **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:** May 10, 2012
- **Seeding rate:** 4.5 pure live seeds/square foot (targeted plant population = 4 plants/square foot).
- **Seed treatment:** Cruiser 5FS 1.28 fl oz/cwt + ApronMaxxRTA 5.0 fl oz/cwt + Mertect 340F 2.04 fl oz/cwt
- **Fungicide application A:** June 29, 2012 at 10:15 to 11:30 am. Chickpeas at 10% bloom (10% of plants with an open blossom) and 75% canopy closure; no *Ascochyta* present. Wind = 4 mph, temperature = 73-76°F, relative humidity = 47-53%.
- **Fungicide application B:** July 10, 2012 at 8:30 to 9:45 am. Chickpeas in full bloom; canopy 95-100% closed. Wind = 4.9-5.4 mph, temperature = 69-75°F, relative humidity = 72-79%.
- **Fungicide application C:** July 24, 2012 at 8:30 to 10:00 am. Chickpeas at end of bloom (80-90% of plants with blossoms remaining). Wind = 4 to 9 mph, temperature = 65-72°F, relative humidity = 74-90%.
- **Fungicide application details:** Fungicides were applied with a 36-inch hand boom equipped with three equally spaced Spraying Systems TeeJet XR 80015VS flat-fan nozzles at a spray volume of 15 gal water/A operated at 35 psi.
- ***Ascochyta* inoculation details:** To promote disease development, guard and buffer plots were inoculated with diseased chickpea residues and with laboratory-grown pycnidiospores of *Ascochyta rabiei* at 11:00 pm to 12:00 am on July 6. A handful of *Ascochyta*-infected chickpea residues collected at the end of the 2011 growing season was placed in the front and back of guard and buffer plots in replicates 2, 3, and 4 and in the front of guard and buffer plots in replicate 1. Spores of *A. rabiei* were grown on potato dextrose agar, suspended in water, and applied to the guard plots at a spore concentration of 88,000 spores/ml at an application rate of 47 gallons of water/ac. A 60-inch hand boom equipped with four equally spaced Spraying Systems twin-jet 8003 nozzles and operated at 20 psi was utilized to apply the spores.
- **Disease assessments:** *Ascochyta* severity was assessed as the percent of the canopy exhibiting *Ascochyta* disease symptoms. Severity was assessed at four locations per plot. Disease evaluations were conducted at the end of bloom on July 25.
- **Harvest date:** September 18, 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. All 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).

## 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 **Syngenta Crop Protection** for donating the seed treatment products Cruiser and Mertect used in this trial, and **JM Grain** for helping us obtain seed of CDC Frontier chickpeas 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 North Central 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.