# Field evaluation of fungicides for management of Mycosphaerella (Ascochyta) blight on field peas

Carrington, ND (2012)

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## KEY FINDINGS:

- **The registered fungicides Headline** (pyraclostrobin), **Proline** (prothioconazole), **and Priaxor** (pyraclostrobin + fluxapyroxad) **provided excellent control of Mycosphaerella blight.**
- **The experimental fungicide Omega** (fluazinam) **provided excellent control of Mycosphaerella blight.**
- **Results from a tank-mix of Inspire** (difenoconazole) **+ Bravo Weather Stik** (chlorothalonil) **suggest that the experimental fungicide Bravo Top** (difenoconazole + chlorothalonil) **may provide excellent control of Mycosphaerella blight.**
- **The SDHI (FRAC 7) fungicides Endura** (boscalid) **and Vertisan** (penthiopyrad) **provided poor control of Mycosphaerella blight.**

## DETAILED RESULTS:

**The fungicides APROACH, INSPIRE / BRAVO TOP, OMEGA, and QUASH are currently not registered for use on field peas and should not be used.** Results are provided for reference only.

| | Treatment | Disease severity[z] July 16[x] percent | Harvest score[y] July 16[x] 1 to 9 | Seeds per pound 15% moisture ounces | Test weight 15% moisture lbs/bu | Yield 15% moisture bu/ac | Protein 0% moisture percent |
|---|---|---|---|---|---|---|---|
| 1 | **Non-treated check** (water) | **67** fg* | **3.5** ab* | **2119** bc* | **66.3** b* | **70.6** bc* | **24.7** a* |
| 2 | **Omega 500F** 0.75 pt/ac **(A,B)**[w] | **38** bc | **5.5** ab | **1954** abc | **67.0** ab | **73.0** bc | **24.4** a |
| 3 | **Omega 500F** 0.875 pt/ac **(A,B)** | **36** abc | **3.3** ab | **1927** abc | **66.8** ab | **73.9** bc | **24.7** a |
| 4 | **Omega 500F** 1.0 pt/ac **(A,B)** | **29** abc | **3.8** ab | **1944** abc | **66.9** ab | **76.8** abc | **24.5** a |
| 5 | **Omega 500F** 0.75 pt/ac **+ Proline 480SC** 5.7 fl oz/ac **(A,B)** | **21** ab | **4.0** ab | **1836** a | **67.0** ab | **82.6** ab | **25.2** a |
| 6 | **Omega 500F** 0.75 pt/ac + **Quadris 2.08SC** 6.0 fl oz/ac **(A,B)** | **21** ab | **1.8** a | **1876** a | **67.4** ab | **79.1** abc | **25.0** a |
| 7 | **Omega 500F** 0.75 pt/ac + **Headline 250SC** 6.0 fl oz/ac **(A,B)** | **15** a | **2.3** a | **1849** a | **67.1** ab | **88.1** a | **24.7** a |
| 8 | **Priaxor 500SC** 4 fl oz/ac **(A,B)** | **41** bcd | **2.0** a | **1917** abc | **67.6** a | **74.8** abc | **24.8** a |
| 9 | **Priaxor 500SC** 6 fl oz/ac **(A,B)** | **29** abc | **2.8** ab | **1851** a | **67.2** ab | **81.6** ab | **24.6** a |
| 10 | **Proline 480SC** 5.0 fl oz/ac **(A,B)** | **34** abc | **1.8** a | **1863** a | **66.9** ab | **81.2** ab | **24.7** a |
| 11 | **Endura 70WG** 6.0 oz/ac **(A,B)** | **73** g | **5.5** ab | **2145** c | **66.4** b | **69.1** bc | **25.0** a |
| 12 | **Inspire 250EC** 6.404 fl oz/ac + **Bravo WS** 22.394 fl oz/ac **(A,B)**[v] | **21** ab | **2.0** a | **1853** a | **66.8** ab | **81.3** ab | **24.8** a |
| 13 | **Headline 250SC** 6 fl oz/ac **(A,B)** | **44** cde | **3.5** ab | **1928** abc | **67.3** ab | **79.1** abc | **25.0** a |
| 14 | **Quadris 250SC** 6 fl oz/ac **(A,B)** | **60** d-g | **2.5** ab | **1969** abc | **67.1** ab | **78.0** abc | **24.7** a |
| 15 | **Aproach 2.08SC** 12 fl oz/ac + **NIS** 0.25% v/v **(A,B)** | **47** c-f | **3.0** ab | **1899** ab | **67.1** ab | **74.0** abc | **24.4** a |
| 16 | **Vertisan 1.67EC** 20 fl oz/ac + **NIS** 0.25% v/v **(A,B)** | **73** g | **6.3** b | **2129** c | **66.4** b | **67.1** c | **24.6** a |
| 17 | **Headline 250SC** 6 fl oz/ac **(A) / Proline 480SC** 5.0 fl oz/ac **(B)** | **37** bc | **2.5** ab | **1876** a | **67.0** ab | **80.4** abc | **25.0** a |
| 18 | **Quash 50WDG** 3.0 oz/ac + **NIS** 0.25% v/v **(A,B)** | **64** efg | **3.3** ab | **1960** abc | **67.2** ab | **71.8** bc | **24.8** a |
| | *F:* | 21.24 | 3.16 | 5.58 | 2.83 | 4.16 | 0.78 |
| | *P* > *F*: | < 0.0001 | 0.0018 | < 0.0001 | 0.0045 | 0.0002 | 0.6992 |
| | CV: | 19.4 | 45.6 | 4.0 | 0.6 | 6.9 | 2.0 |

[z] **Percent of the canopy necrotic:** Canopy necrosis was primarily caused by Mycosphaerella blight but bacterial blight (not controlled by fungicides) also contributed.

[y] **Harvest scores:** A 1 to 9 scale denoting how erect the peas were at harvest, with 1 = perfectly erect and 9 = completely flat. canopy necrosis was primarily caused by Mycosphaerella blight but bacterial blight (not controlled by fungicides) also contributed.

[x] The field peas had already completed bloom on July 16.

[w] **Fungicide application timings A and B:**

**Application A:** June 18, 2012 at 7:45-9:15 pm; 80% of plants with an open blossom; plant height = 30-32 inches; no foliar disease. Wind = 5-8 mph out of the north, temperature = 63-68˚F, relative humidity = 60-70%.

**Application B:** July 3, 2012 at 8:15-10:00 am. Field peas in full bloom; Mycosphaerella blight at trace levels. Wind = 4-7 mph out of the north, temperature = 72-77˚F, relative humidity = 75-86%.

[v] **Applied to approximate the performance of Bravo Top 4.59SC.** Syngenta had insufficient supplies of Bravo Top available for testing; instead, the component ingredients of Bravo Top (difenoconazole and chlorothalonil) were evaluated by tank-mixing Inspire and Bravo WS.

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

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## METHODS:

- **Location of trial:** NDSU Carrington Research Extension Center, Carrington, ND.
- **GPS coordinates of research trial location:** 47.5120,-99.1310
- **Variety:** 'DS Admiral' ( a yellow-cotyledon type)
- **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:** 330,000 pure live seeds/ac
- **Seed treatment:** ApronMaxxRTA 5.0 fl oz/cwt
- **Fungicide application A:** June 18, 2012 at 7:45-9:15 pm; 80% of plants with an open blossom; plant height = 30-32 inches; no foliar disease. Wind = 5-8 mph out of the north, temperature = 63-68˚F, relative humidity = 60-70%.
- **Fungicide application B:** July 3, 2012 at 8:20-10:00 am. Field peas in full bloom; Mycosphaerella blight at trace levels. Wind = 4-7 mph out of the north, temperature = 72-77˚F, relative humidity = 75-86%.
- **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/A operated at 35 psi.
- **Mycosphaerella blight inoculation details:** To promote disease, the trial was inoculated with laboratory-grown pycnidiospores of Ascochyta pinodes (anamorph of Mycosphaerella pinodes) and A. pisi. 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 19 at 1:30 to 2:20 pm; the spores were applied concurently with the application of overhead irrigation; 90 ml of a spore solution containing 220,000 spores/ml were applied to both the front and the back of each guard and buffer plot. Inoculation 2: June 20 at 10:45-11:15 am; the spores were applied concurently with the application of overhead irrigation; 90 ml of a spore solution containing 950,000 spores/ml were applied to both the front and the back of each guard and buffer plot. Inoculation 3: July 5 at 10:15-11:00 pm; 125 ml of a spore solution containing 344,000 spores/ml were applied to both the front and the back of each treatment plot.
- **Disease assessments:** Canopy necrosis was evaluated July 16 during the pod-fill period (bloom completed). Canopy necrosis was primarily due to Mycosphaerella blight but bacterial blight (not controlled by fungicides) also contributed.
- **Irrigation:** To facilitate disease establishment, overhead irrigation was applied with a center pivot during bloom.
- **Harvest date:** 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. 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, 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).

## THANK YOU!

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## 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.