

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

Carrington, ND (2011)

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KEY FINDINGS:

- The registered fungicides **Headline** (pyraclostrobin), **Proline** (prothioconazole), **Priaxor** (pyraclostrobin + fluxapyroxad), and **Quadris** (azoxystrobin) provided a strong yield response under heavy *Mycosphaerella* blight pressure.
- The SDHI (FRAC 7) fungicides **Endura** (boscalid) and **Vertisan** (penthiopyrad) were less effective; sequential applications of Endura (6 oz/ac) and Vertisan (20 fl oz/ac) did not result in a statistically significant increase in yield relative to the control.
- Foliar fungicide usage resulted in modest increases in seed quality.

GENERAL RECOMMENDATIONS FOR USING FUNGICIDES TO MANAGE MYCOSPHAERELLA BLIGHT ON PEAS:

- Fungicides do not always raise yields sufficiently on field peas to provide an economic return. Fungicides are most likely to be profitable when (1) disease pressure is high or (2) the tolerance for Ascochyta infection in the harvested seed is low (such as in seed production).
- The recommended fungicide timing is bloom initiation. In most cases, a single fungicide application is sufficient. However, if weather is highly favorable for disease (cool and wet), a second application may be beneficial 10 to 14 days later.

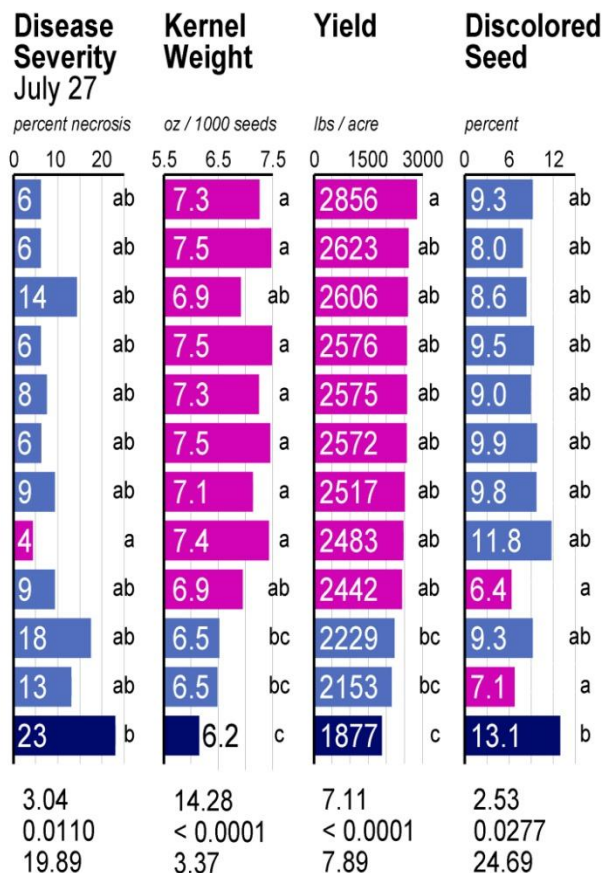
SUMMARY OF KEY RESULTS, 2011 FUNGICIDE TRIAL (Carrington, ND):

Overall yields were severely reduced by a significant hail storm on July 24. The hail storm resulted in both mechanical damage and high levels of bacterial blight, which is not controlled by fungicides.



Seed discoloration: Seeds at the left and center were considered discolored.

- Headline 6 fl oz/ac (A,B)
- Proline 5.7 fl oz/ac (A,B)
- Quadris 6.2 fl oz/ac (A,B)
- Priaxor 6 fl oz/ac (A,B)
- Proline 5 fl oz/ac (A,B)
- Priaxor 4 fl oz/ac (A,B)
- Approach 12 fl oz/ac (A,B)
- Headline 6 fl oz/ac (A) / Proline 5 fl oz/ac (B)
- Confidential (A,B)
- Endura 6 oz/ac (A,B)
- Vertisan 20 fl oz/ac (A,B)
- Non-treated check



Fungicide timing:

- A = July 7 (4 days after bloom initiation)
- B = July 20 (near the end of bloom)

Within-column means followed by different letters are significantly different ($P < 0.05$)

AGRONOMICS OF 2011 FUNGICIDE TRIAL (Carrington, ND):

- **Variety and seeding rate:** 'Admiral'; 330,000 pure live seeds per acre
- **Planting date and seeding rate:** May 18, 2011. Wet conditions precluded an earlier planting date.
- **Fungicide applications:** July 7 (4 days after bloom initiation) and July 20 (near the end of bloom) in 17.5 gal/ac water and 35 psi pressure. A 60-inch hand boom with four equally spaced XR TeeJet 8001VS nozzles was used for applications.
- **Disease establishment:** To ensure sufficient disease pressure to permit the evaluation of fungicide efficacy, the trial was inoculated. Field pea residues from the 2010 season were spread across the trial on June 10. In addition, the buffer and guard plots (these are plots established at the edges of the trial and between each treatment plot to capture spray drift and eliminate edge-effects) were inoculated with laboratory-grown *Mycosphaerella pinodes* on July 8.
- **Harvest date:** August 9, 2011
- **Harvested plot size:** The average harvested plot size was 85.5 square feet.

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DETAILED RESULTS:

Overall yields were severely reduced by a significant hail storm on July 24. The hail storm resulted in mechanical damage and high levels of bacterial blight (not controlled by fungicides).

| TREATMENT (application timing ¹) | DISEASE SEVERITY ² | | HARVEST SCORE ³ | TEST WEIGHT | KERNEL WEIGHT | YIELD | PROTEIN | VISUAL QUALITY |
|---|-------------------------------|--------------------------|----------------------------|-----------------|---------------------|---------------|-----------|-------------------------|
| | July 27 | | Aug. 9 | | | | | |
| | percent necrosis | percent of canopy height | 1 to 9 | pounds / bushel | ounces / 1000 seeds | pounds / acre | percent | percent discolored seed |
| 1 Non-treated check (water) | 23 b * | 83 c * | 8.6 cd * | 64.5 a * | 6.15 c * | 1877 c * | 25.48 a * | 13.1 b * |
| 2 Confidential (A,B) | 9 ab | 71 abc | 8.0 bcd | 64.2 a | 6.94 ab | 2442 ab | 24.68 a | 6.4 a |
| 3 Priaxor 500SC 4.0 fl oz/ac (A,B) | 6 ab | 67 abc | 7.1 ab | 64.6 a | 7.45 a | 2572 ab | 24.85 a | 9.9 ab |
| 4 Priaxor 500SC 6.0 fl oz/ac (A,B) | 6 ab | 50 a | 6.5 a | 64.4 a | 7.49 a | 2576 ab | 24.90 a | 9.5 ab |
| 5 Proline 480SC 5.0 fl oz/ac (A,B) | 8 ab | 54 ab | 7.5 b | 64.7 a | 7.25 a | 2575 ab | 24.80 a | 9.0 ab |
| 6 Proline 480SC 5.7 fl oz/ac (A,B) | 6 ab | 52 ab | 7.4 ab | 64.4 a | 7.48 a | 2623 ab | 24.83 a | 8.0 ab |
| 7 Headline 250SC 6.0 fl oz/ac (A,B) | 6 ab | 59 ab | 7.3 ab | 64.6 a | 7.26 a | 2856 a | 24.60 a | 9.3 ab |
| 8 Quadris 250SC 6.2 fl oz/ac (A,B) | 14 ab | 67 abc | 8.0 bcd | 64.5 a | 6.91 ab | 2606 ab | 24.80 a | 8.6 ab |
| 9 Approach 2.08SC 12 fl oz/ac (A,B) | 9 ab | 67 abc | 7.8 bc | 64.4 a | 7.14 a | 2517 ab | 24.85 a | 9.8 ab |
| 10 Vertisan 1.67EC 20 fl oz/ac (A,B) | 13 ab | 74 bc | 8.8 d | 64.8 a | 6.49 bc | 2153 bc | 24.90 a | 7.1 a |
| 11 Headline 250SC 6 fl oz/ac (A) / Proline 480SC 5.0 fl oz/ac (B) | 4 a | 51 a | 7.1 ab | 63.9 a | 7.43 a | 2483 ab | 24.86 a | 11.8 ab |
| 12 Endura 70WG 6.0 oz/ac (A,B) | 18 ab | 72 abc | 8.9 d | 65.0 a | 6.52 bc | 2229 bc | 25.03 a | 9.3 ab |
| Treatment differences, F : ⁴ | 3.04 | 5.60 | 17.17 | 0.72 | 14.28 | 7.11 | 1.99 | 2.53 |
| Treatment differences, $P > F$: ⁵ | 0.0110 | 0.0002 | < 0.0001 | 0.7081 | < 0.0001 | < 0.0001 | 0.0773 | 0.0277 |
| C.V.: | 19.89 | 14.03 | 4.59 | 1.02 | 3.37 | 3.37 | 1.23 | 24.69 |

¹ Fungicide application timing: (A) = July 7 at 9-10:30 am, full bloom (bloom initiation was 4 days prior); (B) = July 20 at 8-9:30 pm, nearing end of bloom.

² Disease severity: Percent necrosis: percent of the canopy (leaves and stems) that was necrotic due to *Ascochyta*, *Mycosphaerella*, and bacterial blights; *Mycosphaerella* blight predominated. Percent of canopy height: The percent up the canopy that target-shaped lesions with concentric rings (characteristic of *Ascochyta* and *Mycosphaerella* blights) extended.

³ Harvest scores: A 1 to 9 scale denoting how erect the peas were at harvest, with 1 = perfectly erect and 9 = completely flat. A hail storm with 2- to 3-cm diameter hail caused severe lodging on July 24.

⁴ Treatment differences, F : F -values associated with the test of the null hypothesis that there are no differences among treatments.

⁵ Treatment differences, $P > F$: Probability of observing an F -statistic greater than that observed; an assessment of the significance of treatment differences.

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



VISUAL QUALITY: Peas at left and center were considered discolored.



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