

Field evaluation of fungicides for management of Ascochyta blight on chickpeas

Carrington, ND (2009)

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Within-column means followed by different letters are significantly different ($P < 0.05$; Fisher's protected least significant difference).

Fungicide applications:

- A: June 30 (prior to flowering; Ascochyta at trace levels)
- B: July 13
- C: July 28

Fungicides were applied at 35 psi in 17 gallons of water per acre with 80015 flat-fan nozzles.

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

	Ascochyta Incidence				Ascochyta Severity				Yield	Seed size							
	July 15	July 27	Aug. 11	Aug. 31	July 15	July 27	Aug. 11	Aug. 31		lbs/ac	> 10 mm	9-10 mm	8-9 mm	7-8 mm	100 KWT	Seeds / Pound	Test Weight
Untreated Check	100.0	100.0	100.0	100.0	26.3	50.0	83.8	100	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Untreated Check	100.0	100.0	100.0	100.0	35.0	62.5	86.3	100	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Proline 480SC 5 fl oz/ac (A,B,C)	53.8	68.8	63.8	96.0	3.0	2.5	4.5	16	1922	29.5	29.5	20.9	12.7	30.1	1511	61.7	
(C)	57.5	83.8	87.5	99.8	17.0	5.5	9.0	38	295	4.2	13.0	26.2	30.0	19.6	2344	59.6	
Echo 720 1.4 pt (A) / Proline 480SC 5 fl oz/ac (B) / Headline 250EC 6 fl oz/ac (C)	55.0	68.8	73.8	99.8	13.8	4.0	6.5	68	291	28.5	28.1	13.4	10.6	19.0	2423	60.4	
Echo 720 1.4 pt/ac (A) / Proline 480SC 5 fl oz/ac (B,C)	53.8	77.5	77.5	98.8	14.3	5.3	7.5	39	1921	29.5	29.7	21.4	11.1	32.1	1418	62.0	
Echo 720 1.4 pt/ac (A) / Proline 480SC 5 fl oz/ac (B) / Endura 70WG 6 oz/ac (C)	45.0	37.5	47.5	99.5	13.8	2.0	4.5	65	332	3.5	8.7	24.3	31.0	16.9	2887	59.5	
Echo 720 1.4 pt/ac + Proline 480SC 5 fl oz/ac (A,C) / Endura 70WG 6 oz/ac (B)	17.5	22.5	43.8	80.0	2.0	1.5	3.0	9	2989	46.2	33.1	12.5	5.0	39.4	1157	62.0	
Endura 70WG 6 oz/ac (A,B,C)	85.0	91.3	90.0	98.8	8.0	10.0	11.5	56	114	na	na	na	na	na	na	na	
confidential	66.3	71.3	73.8	98.8	5.0	5.0	6.0	38	881	14.9	23.2	29.2	17.9	24.7	1852	60.4	
confidential	65.0	75.0	73.8	99.5	4.0	4.5	6.0	31	1020	24.0	25.1	22.3	15.4	30.4	1504	61.9	
confidential	53.8	60.0	70.0	95.0	2.5	3.0	6.0	16	1560	30.3	26.7	19.6	13.4	32.7	1435	62.2	
confidential	62.5	71.3	77.5	96.5	5.8	8.3	13.8	31	1661	29.7	33.2	20.8	9.0	35.0	1298	62.2	
ProPulse 400SC 8.6 fl oz/ac (A,B,C)	55.0	60.0	62.5	90.3	3.5	3.5	6.0	19	1958	33.9	30.8	21.6	12.6	34.0	1339	61.2	
ProPulse 400SC 10.3 fl oz/ac (A,B,C)	31.3	32.5	42.5	85.0	2.0	1.5	5.0	13	2546	43.6	30.1	14.9	7.9	37.4	1245	61.3	
Proline 480SC 5.7 fl oz/ac (A,B,C)	21.3	30.0	45.0	81.3	1.5	1.5	4.5	9	3820	58.8	28.8	8.0	3.0	45.3	1004	61.8	
MEAN	57.7	65.6	70.5	94.9	9.8	10.7	16.5	40.5	1544	31.2	27.4	19.5	12.6	31.2	1592	61.4	
C.V.%	19.5	23.4	21.4	8.3	26.9	29.5	24.8	37.2	24.2	26.9	14.6	22.7	31.5	10.5	18	1.2	
LSD.05	16.1	21.9	21.4	11.3	3.8	4.5	5.8	21.5	534	12.1	5.8	6.4	5.7	4.7	412	1.1	
LSD.01	21.4	29.2	28.7	15.0	5.0	6.0	7.8	28.6	715	16.4	7.8	8.6	7.7	6.3	554	1.5	

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KEY FINDINGS:

- **Proline exhibited a rate response, with *Ascochyta* control improving as the application rate increased.** Proline applied at 5.7 fl oz/ac resulted in nearly a 50% increase in chickpea yields relative to Proline applied at 5.0 fl oz/ac.
- **SDHI (FRAC 7) fungicides provided unsatisfactory control of *Ascochyta* blight.**
 - **Applications of Endura (6 oz/ac) made at application timing C were overwhelmed by the disease and provided no *Ascochyta* control.** It is not immediately clear whether the poor performance of Endura was due to reduced residual activity relative to Proline or due to poor efficacy under the environmental conditions tested. If poor performance was due to limited residual activity, an additional fungicide application 10 to 14 days after application C may have improved results.
 - **ProPulse, which is a premix of prothioconazole (FRAC 3) and fluopyram (FRAC 7), performed equivalently or worse than Proline (prothioconazole: FRAC 3).** Like boscalid, the active ingredient in Endura, fluopyram is a SDHI (FRAC 7) fungicide. The low rate of ProPulse (8.6 fl oz/ac) resulted in disease control and chickpea yields equivalent to the low rate of Proline (5 fl oz/ac), but the high rate of ProPulse (10.3 fl oz/ac) resulted in chickpea yields nearly 50% lower than the high rate of Proline (5.7 fl oz/ac). Fluopyram appeared to show activity against *Ascochyta* – ProPulse applied at 8.6 fl oz/ac (which contains the equivalent amount of prothioconazole as Proline applied at 3.6 fl oz/ac) performed equivalently to Proline applied at 5 fl oz/ac; ProPulse applied at 10.3 fl oz/ac (which contains the equivalent amount of prothioconazole as Proline applied at 4.3 fl oz/ac) performed better than Proline applied at 5 fl oz/ac – but the relatively low rate of prothioconazole in the ProPulse premix appeared to hinder the performance of ProPulse.
- **Under the conditions evaluated in this trial, chlorothalonil (applied as Echo 720 at 1.4 pt/ac shortly before bloom initiation when *Ascochyta* was at trace levels) performed equivalently to Proline (5 fl oz/ac) when applied as the first product in a fungicide program.**

METHODS:

- **Chickpea variety:** Sierra
- **Planting date:** May 22
- **Harvest date:** September 24
- **Previous crop:** field pea
- **Row spacing:** 7 inches **Rows per plot:** 7
- **Plot size:** 5 ft (center-to-center) by approx. 19 feet long
- **Fungicides were applied at 35 psi in 17 gallons of water per acre with 80015 flat-fan nozzles.**
- **Fungicide application timing:** A: June 30 (prior to flowering; *Ascochyta* at trace levels); B: July 13; C: July 28

ACTIVE INGREDIENTS OF FUNGICIDES EVALUATED IN THIS TRIAL:

Echo 720: 720 grams chlorothalonil per liter

Endura: 700 grams boscalid per kilogram

Headline: 250 grams pyraclostrobin per liter

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.