

POTATO (*Solanum tuberosum* L. 'FL1879')
Late blight; *Phytophthora infestans*

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Evaluation of Reason, Scala, Gavel, and EBDC-based programs for potato late blight control, 2002.

Potatoes [cut seed, treated with Maxim MZ 0.5D (0.5 lb/cwt)] were planted at the Michigan State University Muck Soils Experimental Station, Bath, MI on 5 Jun into two-row by 25-ft plots (34-in row spacing), separated by a five-foot unplanted row and replicated four times in a randomized complete block design. Plots were irrigated as needed with sprinklers and were hilled immediately before sprays began. All rows were inoculated (3.4 fl oz/25-ft row) with a zoospore suspension of *Phytophthora infestans* US8 biotype (insensitive to mefenoxam, A2 mating type) at 10^4 spores/fl oz on 27 Jul. All fungicides in this trial were applied on a 7-day interval from 23 Jun to 21 Aug (9 applications) with an ATV rear-mounted R&D spray boom delivering 25 gal/A (80 p.s.i.) and using three XR11003VS nozzles per row. Weeds were controlled by hilling and with Dual 8E (2 pt/A on 20 Jun), Basagran (2 pt/A on 20 Jun and 15 Jul) and Poast (1.5 pt/A on 28 Jul). Insects were controlled with Admire 2F (20 fl oz/A at planting on 15 Jun), Sevin 80S (1.25 lb/A on 1 and 28 Jul), Thiodan 3EC (2.33 pt/A on 1 and 21 Aug) and Pounce 3.2EC (8 oz/A on 28 Jul). Plots were rated visually for percentage foliar area affected by late blight on 27 Jul; 6, 12, 20, 27 Aug; 3 Sep [13 days after final application (DAFA)] and 7 Sep (DAFA) when there was 100% foliar infection in the untreated plots. The relative area under the disease progress curve was calculated for each treatment from date of inoculation, 27 Jul to 7 Sep, a period of 42 days. Vines were killed with Reglone 2EC (1 pt/A on 8 Sep). Plots (2 x 25-ft row) were harvested on 5 Oct and individual treatments were weighed and graded. Maximum and minimum air temperature (°F) were 92.1 and 64.4 (Jun), 92.5 and 72.5 (Jul), 88.7 and 68.6 (Aug) and 91.3 and 64.8. Maximum and minimum soil temperature (°F) were 82.0 and 70.8 (Jun), 84.6 and 74.2 (Jul), 84.3 and 74.2 (Aug) and 82.3 and 69.3 (to 7 Sep). Precipitation was 0.32" (Jun), 1.14" (Jul), 0.41" (Aug) and 0.0" (to 7 Sep). Plots were irrigated to supplement precipitation to about 1"/A/4 day period with overhead sprinkler irrigation.

Late blight developed slowly after inoculation then rapidly during Aug and untreated controls reached 100% foliar infection by 7 Sep. From 50% emergence to harvest, 100 late blight disease severity values were accumulated (base 80% ambient relative humidity). Taking 38 days after inoculation (DAI) as a key reference point, all fungicide programs reduced the foliar late blight significantly compared to the untreated control. Program 10 had significantly greater foliar late blight than all other programs. All other programs were not significantly different from each other. Taking 42 DAI as a key reference point, there was complete defoliation of the untreated control due to late blight and all fungicide programs had significantly less foliar late blight than the untreated control. Program 6 had significantly greater foliar late blight than all other programs. Programs 1 and 4 had significantly less foliar late blight than all other programs except 7 and 9. All remaining programs were not significantly different from each other. All fungicide programs significantly reduced the average amount of foliar late blight over the season (RAUDPC, 0 to 42 DAI) compared to the untreated control. Application program 6 had a significantly higher RAUDPC value than all other programs with values of 4.17 or lower. Program 10 had a significantly higher RAUDPC value than programs with values of 2.31 or lower. All other programs were not significantly different from each other. Programs 5, 6, 7, 8 and 9 had significantly higher US1 yield than the untreated control and programs 5, 7 and 9 had significantly higher US1 yield than program 2. No other programs had US1 yields significantly different than the untreated control. There were no significant differences among treatments in terms of total yield. Phytotoxicity was not noted in any of the treatments.

Treatment and rate/acre	Foliar late blight (%)		RAUDPC ^x	Yield (cwt/A)	
	38 DAI ^z 13 DAFA ^y	42 DAI 17 DAFA	0 - 42 DAI	US1	Total
1 Bravo WS 6SC 0.76 pt (A,B,C); 1.5 pt (D,E,F,G,H,I) ^w	4.5 d ^v	13.8 d	2.72 cd	237 abc	324 a
2 Bravo WS 6SC 0.76 pt (A,B,C) Reason 4SC 0.75 pt + Bond 3.8SC 0.25 pt (D,E,F,G,H,I).....	4.5 D	22.5 c	3.44 cd	230 ab	301 a
3 Bravo WS 6SC 0.76 pt (A,B,C) Reason 4SC 0.51 pt + Scala 3.2SC 0.64 pt (D,E,F,G,H,I).....	4.5 D	13.8 d	1.83 d	248 abc	339 a
4 Bravo WS 6SC 0.76 pt (A,B,C) Reason 4SC 0.51 pt + Bond 3.8SC 0.25 pt (D,E,F,G) Bravo WS 6SC 0.76 pt + Previcur 6SC 1.2 pt (H,I).....	7.8 cd	21.3 c	2.48 cd	240 abc	322 a
5 Bravo WS 6SC 0.76 pt (A,B,C,H,I) Bravo WS 6SC 0.76 pt + Previcur 6SC 1.2 pt (H,I).....	8.3 cd	21.3 c	3.50 cd	274 c	346 a
6 TD 2390 5.8WDG 6.0 lb (A,B,C,D,E,F,G,H,I).....	8.3 cd	48.8 b	6.87 b	261 bc	331 a
7 Penncozeb 75WP 2.0 lb (A,B,C,D,E,F,G,H,I).....	9.0 cd	20.0 cd	3.01 cd	271 c	335 a
8 Gavel 75WDG 6.0 lb (A,B,F,G,H,I) Dithane RS 75DF 2.0 lb (C,D,E).....	9.5 cd	23.8 c	3.22 cd	251 bc	336 a
9 Gavel 75WDG 6.0 lb (A,B,C,D,E,F,G,H,I).....	10.8 C	17.5 cd	2.31 d	277 c	353 a
10 Dithane RS 75DF 2.0 lb (A,B,C,D,E,F,G,H,I).....	16.3 B	23.8 c	4.17 c	239 abc	314 a
11 Untreated.....	91.5 A	100.0a	27.60a	210 a	280 a

^z Days after inoculation with *Phytophthora infestans*, US8, A2.

^y Days after final application of fungicide.

^x RAUDPC, relative area under the disease progress curve calculated from day of inoculation to last evaluation of late blight. Maximum value = 100.

^w Application dates: A= 23 Jun; B= 1 Jul; C= 8 Jul; D= 15 Jul; E= 22 Jul; F= 30 Jul; G= 7 Aug; H= 14 Aug; I= 21 Aug.

^v Values followed by the same letter are not significantly different at P = 0.05 (Tukey Multiple Comparison).