

Section IV
Potato Pests

MANAGEMENT OF POTATO VIRUSES AND VECTORS

Juan Manuel Alvarez, Aberdeen R&E Center
1693 S 2700 W; University of Idaho, Aberdeen, ID 83210.
jalvarez@uidaho.edu

The experiment was conducted at the University of Idaho, Kimberly Research and Extension Center. The experiment consisted of 11 insecticide foliar treatments and one control replicated

four times in a randomized complete block design. Individual treatment plots were four rows (36 inch row spacing) wide by 25 ft long with 5 ft alleyways separating the plots (see Tables 1 for rates and application methods for each treatment). The experiment was planted on May 7 using hand-cut Russet Burbank potato seeds G2.

Green peach aphids (GPA) were mass reared in growth chambers on Chinese cabbage plants. Aphids became viruliferous after feeding on an infected *Potato virus Y* (PVY^o) tobacco plant. Aphids were then released into the center two rows of each individual test plot on June 30 (20 aphids/plot). Potato aphids (PA) from naturally occurring populations and GPA were counted by non-destructively sampling five plants in the center two rows of each plot for a total of 20 plants per treatment. Aphid counts were taken at weekly intervals for nine weeks from June 24 – Aug 18. Foliar insecticides were sprayed on July 07. ELISA tests were conducted on 5 randomly selected plants /plot (middle two rows) before and after insecticide application. The last ELISA testing was conducted on Aug 8.

The number of aphids is presented as average per plot (5 plants per plot). Data were analyzed using analysis of variance and the treatment means were separated using LSD ($\alpha = 0.05$). Statistical analyses were performed in Statistix using Proc GLM (version 9, Tallahassee, Florida). Results are presented in the tables below.

Table 1. Treatment list and rates.

	Treatment	Amount of Pesticide / Acre
1	Untreated Control	
2	CMT 560	6.0 oz
3	Movento 240 SC DYNE-AMIC	4.0 oz 0.25% V/V
4	Movento 240 SC DYNE-AMIC	5.0 oz 0.25% V/V
5	Movento 240 SC Ammonium Sulfate DYNE-AMIC	5.0 oz 32.0 oz. 0.25% V/V
6	CMT 560 Baythroid XL	6.0 oz 2.8 oz
7	Movento 240 SC Provado 1.6 DYNE-AMIC	5.0 oz 2.8 oz. 0.25% V/V
8	Movento 240 SC Baythroid XL DYNE-AMIC	5.0 oz 2.8 oz. 0.25% V/V
9	Movento 240 SC Provado 1.6 Baythroid XL DYNE-AMIC	5.0 oz 3.0 oz 2.0 oz. 0.25% V/V
10	Movento 240 SC Provado 1.6 Baythroid XL DYNE-AMIC	5.0 oz 3.8 oz 2.8 oz. 0.25% V/V
11	Fulfill	5.50 oz
12	Beleaf NIS	2.8 oz 0.25% V/V

Table 2. Number of Green Peach Aphids (GPA) / 5 plants

Treatment		6/24	6/30	7/7	7/8	7/13	7/23	7/28	8/4	8/11	8/18	BA	AA	Total
1	Untreated Control	0b	4a	2.5b	6.25ab	3.5ab	0.25a	1.5ab	2ab	1a	0.5a	26.0	60.0	86.0
2	CMT 560	0b	4.25a	3ab	4.25bc	1.5b	0.75a	0.75bc	1.25ab	0.75a	0.25a	29.0	38.0	67.0
3	Movento 240 DYNE-AMIC	0b	1a	1.75b	3bcd	5.75a	0.75a	0c	1.5ab	0.25a	0.75a	11.0	48.0	59.0
4	Movento 240 SC DYNE-AMIC	1a	2.75a	1.75b	4.25bc	3.25ab	0.5a	0.5bc	1ab	0a	0.25a	22.0	39.0	61.0
5	Movento 240 Ammonium Sulfate DYNE-AMIC	0b	2.25a	2.75ab	1.75cd	1.5b	0.25a	0.25bc	0.75ab	0.25a	0.25a	20.0	20.0	40.0
6	CMT 560 Baythroid XL	0b	3.75a	3.5ab	1.25cd	1.5b	0a	0.75bc	1ab	0.5a	0a	29.0	20.0	49.0
7	Movento 240 Provado 1.6 DYNE-AMIC	0b	2.5a	2.25b	2.25cd	4.5ab	0.5a	0c	0.25b	0a	0a	19.0	30.0	49.0
8	Movento 240 Baythroid XL DYNE-AMIC	0b	4a	2.5b	2cd	3.5ab	0.5a	2.25a	2.5a	0.25a	1a	26.0	48.0	74.0
9	Movento 240 Provado 1.6 Baythroid XL DYNE-AMIC	0b	4a	4ab	9.5a	1.5b	0a	0.25bc	2.5a	0.75a	0.25a	32.0	59.0	91.0
10	Movento 240 Provado 1.6 Baythroid XL DYNE-AMIC	0b	3a	3.5ab	2.75bcd	1.75b	0.75a	0c	0.75ab	1a	0.25a	26.0	29.0	55.0
11	Fulfill	0b	2.75a	6.25a	3.75bcd	4ab	0.5a	0.75bc	0.5ab	0.25a	0a	36.0	39.0	75.0
12	Beleaf NIS	0b	3.75a	5.25ab	0d	1.25b	0.25a	0c	0.25b	0.25a	0a	36.0	8.0	44.0

*Counts are presented as average number of green peach aphids per plot (5 plants per plot). Treatment means were separated using LSD. Treatment means with the same letters are not significantly different from each other ($\alpha = 0.05$). BA = Cumulative number of aphids before insecticide application. AA = Cumulative number of aphids after insecticide application.

Table 3. Number of Potato Aphids (PA) / 5 plants

Treatment		6/24	6/30	7/7	7/8	7/13	7/23	7/28	8/4	8/11	8/18	BA	AA	Total
1	Untreated Control	0.25ab	1.5ab	1b	2.5a	0b	0.25ab	0.25ab	0b	0	0b	11.0	12.0	23.0
2	CMT 560	0.5ab	4a	0.5b	0b	0b	0b	0b	0.25b	0	0b	20.0	1.0	21.0
3	Movento 240 SC DYNE-AMIC	0b	1.75ab	0.25b	0b	0b	0b	0b	0b	0	0.25ab	8.0	1.0	9.0
4	Movento 240 SC DYNE-AMIC	1a	0.25b	0.25b	1b	0.75a	0b	0.25ab	0b	0	0.5a	6.0	10.0	16.0
5	Movento 240 SC Ammonium Sulfate DYNE-AMIC	0b	0.75b	0.25b	0.25b	0.25ab	0b	0b	0b	0	0b	4.0	2.0	6.0
6	CMT 560 Baythroid	0b	0.5b	0.75b	0.25b	0.25ab	0b	0.25ab	0.25b	0	0b	5.0	4.0	9.0
7	Movento 240 SC Provado 1.6 DYNE-AMIC	0b	0.5b	0.75b	0.5b	0.25ab	0.25ab	0b	0b	0	0.25ab	5.0	5.0	10.0
8	Movento 240 SC Baythroid DYNE-AMIC	0b	0.5b	0.25b	0.25b	0b	0.5a	0b	1a	0	0b	3.0	7.0	10.0
9	Movento 240 SC Provado 1.6 Baythroid DYNE-AMIC	0b	0.5b	0.25b	0.75b	0.25ab	0.25ab	0.5a	0b	0	0b	3.0	7.0	10.0
10	Movento 240 SC Provado 1.6 Baythroid DYNE-AMIC	0b	1.75ab	0.5b	0.5b	0.5ab	0.25ab	0b	1a	0	0b	9.0	9.0	18.0
11	Fulfill	0.25ab	0.25b	0.75b	0.5b	0b	0b	0.25ab	0b	0	0b	5.0	3.0	8.0
12	Beleaf NIS	0b	0.5b	2.5a	0b	0.5ab	0b	0b	0.25b	0	0b	12.0	3.0	15.0

* Counts are presented as average number of green peach aphids per plot (5 plants per plot). Treatment means were separated using LSD. Treatment means with the same letters are not significantly different from each other ($\alpha = 0.05$). BA= Cumulative number of aphids before insecticide application. AA= Cumulative number of aphids after insecticide application.

Table 4. Percentage of PVY before and after insecticide application

#	Treatment	Initial PVY	Cumulative PVY
1	Untreated Control	0	25
2	CMT 560	0	10
3	Movento 240 SC+ DYNE-AMIC	0	15
4	Movento 240 SC+DYNE-AMIC	0	15
5	Movento 240 SC +Ammonium Sulfate+ DYNE-AMIC	0	5
6	CMT 560+ Baythroid XL	0	10
7	Movento 240 SC+ Provado 1.6 + DYNE-AMIC	15	20
8	Movento 240 SC+Baythroid XL+DYNE-AMIC	5	20
9	Movento 240 SC + Provado 1.6 + Baythroid XL+ DYNE-AMIC	10	25
10	Movento 240 SC + Provado 1.6 + Baythroid XL+ DYNE-AMIC	0	10
11	Fulfill	0	10
12	Beleaf + NIS	0	0