Section VIII
Mites & Sap-sucking Insects

GREEN PEACH APHID AND COLORADO POTATO BEETLE CONTROL WITH SEED TREATMENT INSECTICIDES IN POTATOES, 1999

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Experimental plots were established on the UI Research and Extension Center, Kimberly, Idaho. Uncut G2, Russet Burbank potato seed was obtained from the University of Idaho, Tetonia Research and Extension Center. This seed was cut, weighed and treated on a gm formulation per wt of potato basis on 16 Apr. After cutting, seed was placed in heavy-weight plastic bags, the treatment applied and then loosely closed to prevent condensation and stored at 42° F until planted. Potatoes were planted on 22 Apr and irrigated by solid set sprinkler. The soil type was Portneuf silt loam. Fourteen treatments and one untreated check plot were replicated four times in a RCB design. Individual plots were 4 rows (36 inch row spacing) wide by 25 ft long with 5 ft alleyways separating the plots. Green peach aphids (susceptible strain "Our") were obtained from Dr. Tom Mowry, Parma R & E Center, and mass reared on greenhouse mustard plants ('Chinese Cabbage') for release into individual plots. Aphid releases were made into test plots on 25 Jun and 1 Jul. A total of two heavily infested leaves were placed in each plot on each date. Green peach aphid counts were made weekly, from non-destructively sampling 20 leaves at random from the top, middle and bottom sections of plants in the center two rows of each plot. The data collected and presented is the total no. of aphids per 20 leaves sampled. Colorado potato beetle counts were made weekly, from non-destructively sampling 5 plants in the center two rows of each plot for a total of 10 plants per plot. The total no. of adults, large larvae (instar stages 3 and 4), small larvae (instar stages 1 and 2) and egg masses were recorded. An estimation of percent defoliation was also made at this time. The data collected and presented is the mean total no. of beetle stages per 10 plants sampled and estimated mean percent defoliation. To facilitate green peach aphid counts, check plots were treated with Seven 80S on 9 Jul (1.0 lb AI/acre rate) and 23 Jul (1.0 lb AI/acre rate + PBO) to limit defoliation from Colorado potato beetle feeding. Seven 80S was applied as a broadcast S using the modified CO_2 pressurized backpack sprayer as previously described. Data were analyzed using ANOVA and Newman-Keuls multiple means comparison.

Green peach aphid numbers were reduced from the untreated check 81 days (12 Jul) after planting and showed significant reductions from the untreated check 95 days (26 Jul) after planting. Green peach aphid numbers remained low in treated plots until aphid numbers declined naturally between 2 and 16 Aug (102 and 116 days after planting).

Adult Colorado potato beetle numbers were significantly reduced in all treatment plots from the untreated check 47 days (8 Jun), 56 days (17 Jun), 95 days (26 Jul) and 104 days (2 Aug) after planting. Large larvae and small larvae both showed significant reductions in all treatment plots from the untreated check plot from 67 days (28 Jun) after planting to 88 days (19 Jul) after planting when larval numbers declined naturally. Egg masses were significantly reduced from the untreated check plots with all treatment applications from 47 days (8 Jun) after planting to 67 days (28 Jun) after planting when ovipositional activity by adults declined naturally. Defoliation in the untreated check plot reached a level of 30 percent between 81 (12 Jul) and 88 days (19 Jul) after planting. Defoliation levels were never above 3.25% in any of the treatment plots and most remained at zero percent defoliation until natural plant senescence occurred prior to harvest.

Treatment/	Rate	GPA Counts - # GPA / 20 Leaves							
formulation	(lb (AI)/acre	6 Jul	12 Jul	16 Jul	19 Jul	26 Jul	2 Aug	9 Aug	16 Aug
Check	---	2.25a	16.00a	11.75a	26.00c	23.00b	6.50b	6.75a	1.25a
Admire	0.06	4.50a	5.75a	2.75a	5.00ab	3.75a	0.75ab	1.50a	1.25a
Admire	0.12	1.75a	9.75a	3.25a	1.25ab	3.75a	0.75ab	1.25a	0.75a
Admire	0.15	4.50a	6.50a	1.50a	2.00ab	4.00a	2.00ab	3.00a	1.75a
Adage	0.06	3.75a	8.50a	4.25a	5.00ab	2.50a	1.75ab	3.75a	1.75a
Adage	0.14	1.25a	13.25a	4.50a	0.75a	3.25a	0.75qb	1.00a	1.75a
Adage	0.12	3.00a	1.50a	2.25a	0.50a	1.00a	0.50a	0.75a	1.50a
Gaucho	0.03	6.50a	11.50a	5.25a	14.00bc	7.50a	3.50ab	4.00a	2.00a
Gaucho	0.06	5.75a	6.75a	2.00a	5.00ab	8.00a	1.50ab	3.75a	1.25a
Gaucho	0.10	5.50a	4.750a	6.25a	5.75ab	3.25a	1.75ab	1.75a	1.00a
Gaucho	0.12	5.25a	11.25a	4.25a	2.50ab	4.75a	3.25ab	2.50a	2.00a
Gaucho	0.15	3.75a	8.50a	6.00a	2.25ab	8.00a	1.50ab	3.25a	1.25a

Means within a column followed by the same letter are not significantly different ($P = 0.05$; Student-Newman-Keuls). Data were analyzed using ANOVA and Newman-Keuls multiple means comparison ($P = 0.05$).

Treatment/	Rate	No. CPB adults/10 plants								
formulation	(lb (AI)/acre	8 Jun	17 Jun	21 Jun	28 Jun	6 Jul	12 Jul	19 Jul	26 Jul	2 Aug
Check	---	2.25b	11.75b	5.75b	3.00a	0.25a	1.75a	1.00a	4.25b	87.75b
Admire	0.06	0.00a	0.50a	0.75a	1.25a	0.00a	1.00a	0.00a	1.00a	7.25a
Admire	0.12	0.00a	0.75a	0.00a	0.25a	0.00a	0.00a	0.00a	0.00a	0.75a
Admire	0.15	0.00a	0.25a	0.50a	0.00a	0.00a	1.25a	0.50a	0.00a	0.00a
Adage	0.06	0.00a	0.00a	0.00a	0.25a	0.00a	0.00a	0.00a	1.00a	2.25a
Adage	0.14	0.00a	0.25a	2.00a	0.00a	0.00a	0.25a	0.00a	0.25a	0.00a
Adage	0.12	0.00a	0.00a	2.00a	0.25a	0.00a	0.00a	0.00a	0.00a	0.00a
Gaucho	0.03	0.00a	0.75a	1.00a	1.25a	1.25b	1.50a	3.00b	1.25a	5.75a
Gaucho	0.06	0.25a	0.00a	1.75a	0.75a	0.00a	0.00a	1.25a	0.25a	1.75a
Gaucho	0.10	0.25a	0.75a	0.00a	0.25a	0.00a	0.75a	0.25a	0.25a	0.25a
Gaucho	0.12	0.25a	0.00a	0.50a	0.50a	0.50a	0.00a	0.75a	0.25a	3.00a
Gaucho	0.15	0.25a	0.25a	0.50a	0.25a	0.00a	0.00a	0.75a	0.00a	0.75a

Means within a column followed by the same letter are not significantly different ($P = 0.05$; Student-Newman-Keuls). Data were analyzed using ANOVA and Newman-Keuls multiple means comparison ($P = 0.05$).

Treatment/ Formulation	Rate (lb (AI)/acre	No. CPB large larvae/10plants						
		21 Jun	28 Jun	6 Jul	12 Jul	19 Jul	26 Jul	2 Aug
Check	---		3.50 b	42.25 b	60.00 b	97.25 b	0.75 a	0.50 a
Admire	0.06		0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Admire	0.12		0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Admire	0.15		0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Adage	0.06		0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Adage	0.14		0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Adage	0.12		0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Gaucho	0.03		0.00 a	0.00 a	0.00 a	1.75 a	6.75 b	12.50 b
Gaucho	0.06		0.00 a	0.00 a	0.00 a	0.50 a	1.75 a	3.00 a
Gaucho	0.10		0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.50 a
Gaucho	0.12		0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.50 a
Gaucho	0.15		0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a

Means within a column followed by the same letter are not significantly different ($P = 0.05$; Student-Newman-Keuls). Data were analyzed using ANOVA and Newman-Keuls multiple means comparison ($P = 0.05$).

Treatment/ formulation	Rate (lb (AI)/acre	No. CPB small larvae/10 plants						
		21 Jun	28 Jun	6 Jul	12 Jul	19 Jul	26 Jul	2 Aug
Check	---	3.75 a	87.25 b	118.50 b	60.25 b	21.00 b	0.00 a	0.00 a
Admire	0.06	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.50 a	0.50 a
Admire	0.12	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Admire	0.15	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Adage	0.06	0.00 a	0.00 a	0.00 a	0.00 a	7.75 a	0.00 a	0.00 a
Adage	0.14	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Adage	0.12	0.50 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Gaucho	0.03	0.00 a	0.00 a	6.25 a	1.75 a	8.75 a	6.25 a	6.25 a
Gaucho	0.06	1.00 a	0.00 a	0.00 a	0.00 a	0.50 a	2.75 a	3.00 a
Gaucho	0.10	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.50 a
Gaucho	0.12	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Gaucho	0.15	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a

Means within a column followed by the same letter are not significantly different ($P = 0.05$; Student-Newman-Keuls). Data were analyzed using ANOVA and Newman-Keuls multiple means comparison ($P = 0.05$).

Treatment/ Formulation	Rate (lb (AI)/acre	No. Egg masses/10 plants								
		8 Jun	17 Jun	21 Jun	28 Jun	6 Jul	12 Jul	19 Jul	26 Jul	2 Aug
Check	---	0.50 b	17.50 b	20.00 b	11.75 b	1.50 b	0.75 a	0.00 a	0.00 a	0.00 a
Admire	0.06	0.00 a	0.00 a	0.00 a	0.75 a	0.00 a	0.25 a	0.00 a	0.25 a	0.00 a
Admire	0.12	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Admire	0.15	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.25 a	0.00 a	0.00 a
Adage	0.06	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.25 a
Adage	0.14	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Adage	0.12	0.00 a	0.00 a	4.25 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Gaucho	0.03	0.00 a	0.00 a	0.00 a	0.00 a	1.75 b	0.50 a	2.00 b	1.00 a	0.50 a
Gaucho	0.06	0.00 a	0.00 a	2.50 a	0.00 a	0.75 ab	0.00 a	0.25 a	0.50 a	0.25 a
Gaucho	0.10	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Gaucho	0.12	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.50 a	0.00 a	0.00 a	0.00 a
Gaucho	0.15	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a	0.25 a

Means within a column followed by the same letter are not significantly different ($P = 0.05$; Student-Newman-Keuls). Data were analyzed using ANOVA and Newman-Keuls multiple means comparison ($P = 0.05$).

Treatment/ formulation	Rate (lb (AI)/acre	CPB % defoliation				
		8 Jul	12 Jul	19 Jul	26 Jul	2 Aug
Check	---	5.25 b	17.50 b	42.50 b	36.25 b	43.75 b
Admire	0.06	0.00 a	0.00 a	0.00 a	0.00 a	0.75 a
Admire	0.12	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Admire	0.15	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Adage	0.06	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Adage	0.14	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Adage	0.12	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Gaucho	0.03	0.00 a	0.00 a	0.00 a	0.25 a	3.25 a
Gaucho	0.06	0.00 a	0.00 a	0.00 a	0.00 a	0.25 a
Gaucho	0.10	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Gaucho	0.12	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a
Gaucho	0.15	0.00 a	0.00 a	0.00 a	0.00 a	0.00 a

Means within a column followed by the same letter are not significantly different ($P = 0.05$; Student-Newman-Keuls). Data were analyzed using ANOVA and Newman-Keuls multiple means comparison ($P = 0.05$).

Treatment/ Formulation	Rate (lb (AI)/acre	CPB & GPA yield in mean pounds per grade					
		Large 1**	Small 1**	Large 2**	Small 2**	Culls*	Total
Check	---	2.3 a	23.4 a	1.1 a	9.6 a	20.7 b	57.1 a
Admire	0.06	15.5 ab	41.0 b	3.4 ab	8.1 a	18.8 ab	86.8 b
Admire	0.12	16.7 ab	37.2 ab	5.8 ab	10.1 a	14.7 ab	84.4 b
Admire	0.15	27.0 b	38.2 ab	6.8 ab	8.7 a	13.3 ab	94.1 b
Adage	0.06	12.7 ab	38.2 ab	3.2 ab	7.8 a	17.6 ab	79.4 ab
Adage	0.14	12.2 ab	26.9 ab	6.1 ab	8.4 a	18.3 ab	71.8 ab
Adage	0.12	15.4 ab	31.6 ab	4.6 ab	8.3 a	18.7 ab	78.5 ab
Gaucho	0.03	13.4 ab	29.7 ab	2.9 ab	13.7 a	15.3 ab	75.0 ab
Gaucho	0.06	19.6 ab	31.6 ab	9.0 b	7.5 a	13.7 ab	81.4 ab
Gaucho	0.10	11.8 ab	29.9 ab	6.6 ab	12.8 a	17.2 ab	78.1 ab
Gaucho	0.12	14.7 ab	38.6 ab	4.6 ab	7.1 a	15.2 ab	80.1 ab
Gaucho	0.15	14.7 ab	41.9 b	6.7 ab	9.3 a	13.1 a	85.7 b
Mean Total*		14.7 c	34.5 d	4.9 a	9.4 b	15.9 c	

Means within a column followed by the same letter are not significantly different ($P = 0.05$; Student-Newman-Keuls). Data were analyzed using ANOVA and Newman-Keuls multiple means comparison ($P = 0.05$).

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