POTATOES & INSECTICIDES

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COLORADO POTATO BEETLE

The Colorado potato beetle (CPB) is often a pest of potatoes in Washington and insecticides are used to reduce the damage it causes. Because insecticides are necessary to produce high quality potatoes we evaluated efficacies of 7 foliar applied insecticides and the effects of adding the "kicker" Butacide to Pydrin for CPB control.

Plots were established in potato fields in the Yakima Valley. Plot size was 4 rows x 20 feet and arranged in a randomized complete block design with 4 replications. Insecticide treatments were applied with a R&D CO2 pressurized sprayer at a rate of 25 gallons per acre using a hand-held boom with 4 nozzles. Evaluations were made by counting the number of CPB on 10 plants in the center 2 rows of each plot.

Results:

In 1988, Capture (tested at .02, .04 and .06 (AI/a)) Pounce, Pydrin, and Scout reduced beetle numbers to near zero (Tables 1A,B). RH-5849 which is a slow acting material also significantly reduced CPB (Table 1A). ABG-6263, a slow acting Bacillus formulation significantly reduced CPB (Table 1C,D). In addition, ABG-6263 substantially reduced the amount of defoliation -- 34% in the treated plots compared to 95% in the check.

In 1987, all 5 rates of Pydrin tested significantly reduced CPB populations and adding Butacide appeared to increase the activity of Pydrin (Table 2). In 1988, adding Butacide to a low rate of Pydrin improved CPB control (Table 1A). In both years the low rate of Pydrin alone gave good beetle control.

In 1987, ABG-6256 treatments resulted in signficantly fewer CPB at 7 days after application (Table 3).

GREEN PEACH APHID

The green peach aphid (GPA), a serious pest of potatoes in Washington, is usually controlled by insecticide applications. We evaluated efficacies of 4 foliar applied insecticides against green peach aphid during 1987-88.

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Results:

In 1987, RH-7988 treatments resulted in significantly fewer GPA at as compared to the untreated check (Table 4). In 1988, at 2 days after application there were 87 to 99% fewer GPA in the plots treated with RH-7988 as compared to the untreated check. A dosage response was evident (Table 5). At 21 days after application there were 98% fewer GPA in the plots treated with the high rate of RH-7988. RH-7988 is a new insecticide specific for aphids and may well fit into an integrated control program on potatoes.

In 1988, the number of GPA in plots treated with Capture were reduced 19 to 34% at 2 days after application. At 7 days after application there were 52 to 68% fewer GPA in the plots treated with the higher rates of Capture (Table 5). At 13 days after the second application there were no significant differences in the number of GPA in the plots treated with Capture as compared to the untreated check. Capture appears rather weak as a control for GPA.

Applications of Pounce did not result in a significant reduction in the number of GPA as compared to the untreated check (Table 5).

Monitor was used as the standard in these tests and significantly reduced GPA populations (Tables 4,5).

TEMIK

During 1987 we conducted a field monitoring program in 5 commercial potato fields in central Washington: 1) to compare control of GPA, CPB and two spotted spider mite with Temik versus other systemic insecticides and 2) to determine if applications of Temik increased potato yields. At each field, half the field was treated with Temik (20 lbs/a) and the other half treated with a different systemic insecticide. The fields were monitored weekly from 6/16 to 8/31 for insect pests. At harvest, the amount of row required to fill 4 trucks from each side was measured separately using a Gandy measuring wheel and each truck weighed to compare yields in the two halves.

Results:

In general, Temik held green peach aphid and two spotted spider mite populations at a much lower level and for a longer time than the other systemic insecticides. In most fields about 2 tons more of potatoes per acre were produced on the half of the field treated with Temik.

CONCLUSION

Insecticides are essential for control of the green peach aphid, Colorado potato beetle and two spotted spider mite in the production of potatoes. It is imperative that new and old insecticides be tested to incorporate into a pest management scheme for insect pest control. Our screening program suggests there are several insecticides showing promise for control of insect pests of potato.

Tables 1A,B,C,D. Effects on Colorado Potato Beetle (CPB) larvae of insecticide applications to 0.005 acre plots of "Russet Burbank" potatoes, Prosser, WA. 1988. Means within a column followed by different letters are significantly different ($p < .05$, Duncan's multiple range test).

Table 1A (5/31)* Treatment	lb AI/ acre	mean # CPB larvae per plant on sampling date: 2 June	7 June	14 June	21 June	27 June
Capture 2EC	**	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a
Pounce 3.2EC	0.1	0.0 a	0.0 a	0.05a	0.0 a	0.0 a
Pydrin 2.4EC	0.025	0.3 a	0.2 a	0.0 a	0.03a	0.03a
Pydrin 2.4EC + Butacide	0.025 + 0.25	0.0 a	0.03a	0.0 a	0.03a	0.0 a
Pydrin 2.4EC	0.1	0.0 a	0.0 a	0.03a	0.0 a	0.03a
RH-5849 2F + Triton B-1956	0.2 + 0.03%	2.6 b	2.6 b	1.4 b	2.1 b	0.2 a
RH-5849 2F + Triton B-1956	0.3 + 0.03%	3.0 b	2.0 b	1.2 b	2.5 b	0.3 a
Check	--	3.0 b	6.3 c	8.0 c	7.4 c	3.5 b

Table 1B (6/8)* Treatment	lb AI/ acre	mean # CPB larvae per plant on sampling date: 10 June	13 June	20 June	27 June
Scout 0.3EC	0.015	0.03a	0.0 a	0.0 a	0.1 a
Scout 0.3EC	0.019	0.0 a	0.0 a	0.0 a	0.0 a
Pydrin 2.4EC	0.1	0.0 a	0.0 a	0.0 a	0.03a
Check	--	6.3 b	8.0 b	7.4 b	3.5 b

Table 1C (6/10)* Treatment	Rate/ acre	mean # CPB 1 & 2 instar/plant on sampling date: 13 June	17 June$	20 June	27 June	5 July
ABG-6263 WP+ Bond	1 lb + 125 ml	3.0 abc	2.3 ab	0.6 a	0.5 ab	0.0 a
ABG-6263 WP + Bond	2 lb + 125 ml	3.4 ab	1.4 bc	0.6 a	0.0 b	0.0 a
ABG-6263 WP + Bond	3 lb + 125 ml	1.9 bc	1.5 bc	0.6 a	0.03b	0.0 a
Pydrin 2.4EC	5.33 oz	0.0 c	0.0 c	0.0 a	0.0 b	0.0 a
Check	--	4.9 a	3.9 a	2.0 b	1.1 a	0.5 a

Table 1D (6/10)* Treatment	Rate/ acre	mean # CPB 3 & 4 instar/plant on sampling date: 13 June	17 June$	20 June	27 June	5 July
ABG-6263 WP + Bond	1 lb + 125 ml	3.4 a	6.6 b	2.9 a	0.7 a	0.1 a
ABG-6263 WP + Bond	2 lb + 125 ml	2.1 a	4.8 b	3.3 a	1.0 a	0.5 a
ABG-6263 WP + Bond	3 lb + 125 ml	2.3 a	3.8 b	1.2 b	1.0 a	0.7 ab
Pydrin 2.4EC	5.33 oz	0.0 b	0.0 c	0.0 c	0.03b	0.0 a
Check	--	3.6 a	10.7 a	5.4 d	2.4 c	1.1 b

* Date of treatment application. ** All 3 rates of Capture 2EC (.02, .04, .06 lb AI/acre) gave 100% kill of CPB larvae. $ ABG plots re-treated on 18 June.

Table 2. CPB - % reduction from untreated check

	oz/acre	6/18	6/15	6/22
Pydrin	0.66	60	97	100
Pydrin + Butacide	0.66	92	97	93
Pydrin	1.33	62	92	93
Pydrin + Butacide	1.33	87	96	100
Pydrin	2.66	92	94	100
Pydrin + Butacide	2.66	98	92	97
Pydrin	5.3	100	97	100

Table 3. CPB - % reduction from untreated check

	lb/acre	7/23	7/28	8/4
ABG-6256	1.0	37	57	0
ABG-6256	1.5	25	57	33
Pydrin	5.3 oz	99	100	99

Table 4. GPA - % reduction from untreated check

	oz/acre	7/17	7/22	7/29
RH-7988	2	64	70	0
RH-7988	4	73	70	43
RH-7988	8	73	80	29
Monitor	32	98	97	43

Table 5. Effect of insecticides applied to 0.005 plots of "Russet Burbank" potatoes on 29 June on green peach aphid (GPA). Prosser, Wa. 1988.

		Mean No. GPA/leaf				
Treatment	lb(AI)/a	1 Jul	6 Jul*	13 Jul	20 Jul	27 Jul
Capture 2 EC	0.02	5.3 a	5.1 bc	11.7 bc	27 a	--
Capture 2 EC	0.04	5.7 a	2.5 cd	9.5 c	26 a	--
Capture 2 EC	0.06	6.5 a	3.8 cd	10.3 bc	22 a	--
Pounce 3.2 EC	0.1	8.3 a	11.6 a	31 a	--	--
RH-7988 4 E + Crop Oil	0.06 + 1 pt	1.0 b	1.9 cd	11 bc	16 ab	--
RH-7988 4 E + Crop Oil	0.125 + 1 pt	0.8 b	1.2 cd	3.1 c	8 ab	3.1a
RH-7988 4 E + Crop Oil	0.25 + 1 pt	0.05 b	0.05 d	0.7 c	0.3 c	0.6a
Monitor 4 E	1.0	0.7 b	0.2 d	0.6 c	0.5 c	0.5a
Untreated check	--	8.0 a	7.9 ab	24 ab	19 ab	1.4a

*Capture and Pounce plots (Pounce at 0.2 lb(AI)/a) re-treated 7 July.

Means within a column a followed by the same letter are not significantly different at the P = 0.05 level, Duncan's Multiple Range Test.