

DAVIDSON

1984-1986

POTATO INSECTICIDE TRIALS

DEPARTMENT OF ENTOMOLOGY

COLORADO STATE UNIVERSITY

COMPILED BY:

Whitney Cranshaw
Department of Entomology
Colorado State University
Ft. Collins, CO 80523

SUMMARY OF POTATO INSECTICIDE TRIALS
1984-1986

Whitney S. Cranshaw
Department of Entomology
Colorado State University
Fort Collins, Colorado

TABLE OF CONTENTS

Green Peach Aphid Control, Center, CO., 1986	1
Potato Insect Control, Rocky Ford, CO., 1986	2
Control Of Potato Insects With Foliar Insecticides, Larimer County, CO., 1985	3
Control Of Potato Insects With Post-Emergence Applications Of Soil Systemic Insecticides, Larimer County, CO., 1986	4
Green Peach Aphid Control On Potatoes, Center, CO., 1985	5
Potato Insect Control With Systemic Insecticides, Larimer County, CO., 1985	6
Potato Insect Control, Center, CO., 1984	8
Control Of Potato Psyllid And Green Peach Aphid, Fort Collins, CO., 1984	10
Control Of Potato Insects With Soil Applied Systemic Insecticides, Greeley, CO., 1984	12
Control Of Potato Insects With Foliar Insecticides, Greeley, CO., 1984	13
Control Of Potato Insects With Soap Sprays, Greeley, CO., 1984	15
Potato Herbicide/Insecticide Interaction Trial, Center, CO., 1985	16
Insecticide-Herbicide Interaction Trial, Center, CO., 1986	17

Whitney S. Cranshaw,
 Robert J. Hammon, and
 David J. Liewehr
 Department of Entomology
 Colorado State University
 Fort Collins, CO 80523

GREEN PEACH APHID CONTROL, CENTER, CO., 1986: "Russet Burbank" potatoes were planted May 19 to 34" rows in a furrow-irrigated field near the San Luis Valley Experiment Station, Center, CO. Plots were 4-row, 25' in length arranged in a randomized complete block design with 4 replications. Treatments were applied using a CO₂ compressed air sprayer delivering 40.6 gal/A at ca 35 psi. First applications were made July 8 when the first aphid was detected on the plots (1 potato aphid per 140 leaves). Second treatments were applied August 8 after plot evaluations. Planting time Temik treatments were applied as lightly incorporated bands over the seed piece. Sidedress treatments were made June 30 as double bands along the sides of the ridge. Evaluations were made by counting all aphids on 35 randomly selected leaves per plot.

Aphid populations were very low during the early season. Soil applied Temik planting and sidedress treatments gave a high level of aphid control throughout the trial. Among foliar applications, Asana, Pydrin and the low rate of Capture gave more persistent control than the other synthetic pyrethroids Pounce and Cymbush. No phytotoxicity was observed from any treatment.

Treatment	lbs (AI)/acre	Aphids/140 leaves				
		Jul 7	Jul 29	Aug 8	Aug 19	Aug 29
Temik 15G (planting)	3.0	0	0	0	0	0
Temik 15G (6/30 sidedress)	2.0	0	1	0	0	4
Asana 1.9E	0.025	0	1	0	0	6
Pydrin 2.4E	0.01	0	0	2	0	21
Capture 2E	0.04	0	0	1	1	19
Capture 2E	0.08	0	0	0	4	27
DiSyston 8E	1.0	0	0	0	5	35
Pounce 3.2E	0.1	0	0	2	18	57
Cymbush 3E	0.08	0	0	0	0	78
Untreated check		0	6	30	184	91

Whitney S. Cranshaw
 Department of Entomology
 Colorado State University
 Fort Collins, CO 80523

POTATO INSECT CONTROL, ROCKY FORD, CO, 1986: "Russet Burbank" potatoes were planted April 11, 9185 at the Arkansas Valley Research Center, Rocky Ford, CO. Plots were 2-row, 10' in length, arranged in a randomized complete block design with 4 replications. Treatments were applied July 17 with a CO₂ compressed air sprayer delivering 115 gals/acre at ca 30 psi. Evaluations were made 5 and 12 days after treatment by examining 35 leaves/plot.

All the treatments gave control of potato psyllid. Leafhopper control on plots treated with Asana and Pydrin appeared to be of short duration, with populations increasing twelve days after treatment. Baythroid applications resulted in greatly increased green peach aphid populations. None of the treatments were phytotoxic.

Treatment	lbs (AI)/ Acre	Insects/140 leaves*					
		Green Peach Aphid		Potato Psyllid		Leafhopper	
		July 22	July 29	July 22	July 29	July 22	July 29
Asana 1.9E	0.025	2b	7b	0b	1b	1b	37ab
Asana 1.9E	0.05	2b	1b	0b	0b	0b	12b
Pydrin 2.4E	0.1	1b	5b	0b	1b	1b	18b
Capture 2E	0.1	4b	5b	4b	2b	1b	1c
Baythroid 2.4E	0.04	65a	144a	2b	0b	0b	1c
Untreated check		4b	4b	31a	33a	31a	56a

*Total of 4 replications. Numbers followed by the same letter are not significantly different (P = 0.05) by DMRT.

**Empoasca abrupta Delong

Whitney S. Cranshaw,
 Jarra Jagne,
 Martha Lordier and
 Robert Wawryznski
 Department of Entomology
 Colorado State University
 Fort Collins, CO 80523

CONTROL OF POTATO INSECTS WITH FOLIAR INSECTICIDES, LARIMER COUNTY, COLORADO, 1985: "Russet Burbank" potatoes were planted May 9, 1985 at the Colorado State University Horticulture Research Center, Larimer County, CO. Plots were 3 row (30-in spacing), 25' in length randomized in a complete block design with 4 replications. Treatments were applied August 12 using a CO₂ compressed air sprayer delivering 61 gals/A. Evaluation of potato psyllid and green peach aphid were made August 16 and August 26 by counting 35 leaves per plot. Colorado potato beetle larvae were collected from nearby vegetation and confined with treated foliage picked after sprays had dried. Mortality of Colorado potato beetle larvae was assessed 24 and 96 hours after exposure to treated foliage.

Potato psyllid pressure was light and clear differences were not established between treatments although Kryocide and San 416 clearly did not appear effective. Green peach aphid was only suppressed by the synthetic pyrethroid materials (Capture, Karate, Baythroid) included in the trial. Some control of Colorado potato beetle was achieved by all treatments with synthetic pyrethroids generally giving superior performance. None of the treatments appeared phytotoxic.

Treatment	lbs (AI)/ Acre	Potato psyllid/ 140 leaves		Green peach aphid/ 140 leaves		Colorado Potato Beetle/ % Mortality	
		8/16	6/26	8/16	8/26	24 hr	96 hr
Baythroid 2E	0.04	2a	0c	10ab	50ab	30ab	83a
Capture 2E	0.02	2a	0a	0a	18a	80a	100a
Karate 1E	0.02	0a	1a	3a	19a	84a	98a
Kryocide 96W	15 lbs	9a	29a	20bc	301d	26ab	64ab
Penncap-M 2FM	0.5	3a	5a	19bc	240cd	45ab	88a
San 416	1 gal	9a	4a	9a	107abcd	15bc	42ab
Untreated Check		2c	8a	21bc	153bcd	12c	30b

Whitney S. Cranshaw and
 David J. Liewehr
 Department of Entomology
 Colorado State University
 Fort Collins, CO 80523

CONTROL OF POTATO INSECTS WITH POST-EMERGENCE APPLICATIONS OF SOIL SYSTEMIC INSECTICIDES, LARIMER COUNTY, COLORADO, 1986: "Russet Burbank" potatoes were planted May 20 at the Colorado State University Horticulture Research Center, Larimer County, Colorado. Plots were 6 row (30" spacing), 25 feet in length, arranged in a 4x4 Latin Square design. Treatments were applied June 18 shortly after plant emergence, as a double band along the base of the plants. Insecticides were lightly incorporated following application and immediately were furrow irrigated. Evaluation of potato psyllid and green peach aphid was made by examining 35 lower leaves per plot. Colorado potato beetle larvae were counted on the center 4 rows of each plot.

Insect pressure was generally light and declined as the season progressed. Temik provided superior control of the Colorado potato beetle, although all treatments gave some suppression. Erratic results were achieved in potato psyllid control and some increase in aphid numbers was temporarily observed on Thimet and DiSyston plots. None of the treatments resulted in noticeable phytotoxicity.

<u>Treatment</u>	<u>Rate/Acre</u>	<u>Potato psyllid/140 leaves*</u>				
		<u>Jul 7</u>	<u>Jul 14</u>	<u>Jul 21</u>	<u>Aug 1</u>	<u>Aug 14</u>
Temik 15G	20 lbs	7	13	10	8	2
Thimet 20G	15 lbs	1	15	2	5	5
DiSyston 15G	20 lbs	2	9	7	2	6
Untreated		1	15	2	8	14

<u>Treatment</u>	<u>Rate/Acre</u>	<u>Green peach aphid/140 leaves*</u>				
		<u>Jul 7</u>	<u>Jul 14</u>	<u>Jul 21</u>	<u>Aug 1</u>	<u>Aug 14</u>
Temik 15G	20 lbs	0	0	0	0	
Thimet 20G	15 lbs	17	5	2	0	
DiSyston 15G	20 lbs	13	1	0	0	
Untreated		4	1	2	0	

<u>Treatment</u>	<u>Rate/Acre</u>	<u>Colorado potato beetles/400 Row-feet*</u>	
		<u>Jul 7</u>	<u>Jul 14</u>
Temik		4	2
Thimet 20G	15 lbs	97	38
DiSyston 15G	20 lbs	264	56
Untreated		352	125

*Total of 4 replications

David J. Liewehr and
 Whitney S. Cranshaw
 Department of Entomology
 Colorado State University
 Fort Collins, CO 80523

GREEN PEACH APHID CONTROL ON POTATOES, CENTER, CO. 1985: "Russet Burbank" potatoes were planted May 7 at the San Luis Valley Research Center, Center, CO. Plots were 3 row, 24' in length, arranged in a randomized complete block design with four replications. Treatments were applied July 11 and August 8 using a CO² compressed air sprayer delivering 64 gal/A. An additional Kryocide treatment was applied from the center row of each plot. Green peach aphid predominated although small numbers of potato aphids were also observed.

All of the treatments, except Kryocide, significantly reduced aphid populations. Pydrin and Monitor were significantly more effective than other treatments at delaying the build-up of late season aphid populations. None of the treatments were phytotoxic.

Treatment*	lbs (AI)/A	Aphids/35 leaves**				
		Jul 24	Aug 1	Aug 8	Aug 15	Aug 22
Cygon 400	0.375	0.5bc	6.5abc	21.0bc	15.5b	113.8b
DiSyston 8E	0.75	1.0bc	3.0bcd	9.8c	2.0c	19.3bc
Kryocide 96W	30.0	13.8ab	17.0ab	87.8ab	169.3a	791.0a
Metasystox-R 2E	0.5	0.8bc	0.3d	2.3cde	2.3c	21.8bc
Monitor 4WM	0.75	0.0c	0.0d	0.5de	0.0c	7.5c
Pydrin 2.4E	0.1	0.0c	0.0d	0.3e	0.0c	5.5c
Thiodan 3E	0.75	0.0c	1.0cd	6.0cd	4.5c	38.5bc
Untreated Check		19.3a	29.5a	163.0a	454.5a	433.0a

*Treatment dates were July 11 and August 8. An additional Kryocide application was made July 25.

**Average of four replications. Original data transformed $\ln(X + 1)$ for analysis. Numbers followed by the same letter are not significantly different ($P = 0.05$) by Duncan's MRT.

Whitney S. Cranshaw,
 Jarra F. Jagne, Martha K. Lordier,
 Robert P. Wawrzynski, and
 David J. Liewehr
 Department of Entomology
 Colorado State University
 Fort Collins, CO 80523

POTATO INSECT CONTROL WITH SYSTEMIC INSECTICIDES, LARIMER COUNTY, COLORADO, 1985: "Norchip" potatoes were planted May 8, 1985 at the Colorado State University Horticulture Research Center, Larimer County, CO. Plots were 6-row, 25' in length, randomized in a complete block design with four replications. Treatments were applied post-emergence June 14 by banding the insecticides 4-6 inches along the sides of the planting. Plants were less than 6 inches at the time of treatment and treatments were incorporated immediately post-application. Potato psyllid, green peach aphid and onion thrips were sampled by examining 35 leaves/plot. Colorado potato beetle larvae were counted August 19 by counting all larvae on center rows of each plot.

Temik gave superior control of green peach aphid. Potato psyllid was best controlled by organophosphate materials (Aastar, Thimet, DiSyston). Furadan significantly reduced onion thrips one month after treatment. All treatments suppressed Colorado potato beetle populations. No phytotoxicity was observed.

<u>Treatment</u>	<u>Rate/ Acre</u>	<u>Green peach aphid/140 leaves</u>					
		<u>Jul 9</u>	<u>Jul 17</u>	<u>Jul 24</u>	<u>Aug 1</u>	<u>Aug 8</u>	<u>Aug 16</u>
Aastar 15G	20 lbs	16a	6a	9a	20ab	24a	92d
DiSyston 15G	20 lbs	11a	4a	5a	10ab	9a	40ab
Furadan 15G	20 lbs	26a	1a	7a	51c	37a	96cd
Temik 15G	13.3 lbs	2a	0a	1a	1a	4a	8a
Thimet 20G	15 lbs	15a	3a	14a	33bc	16a	51abc
Untreated check		37a	16a	33b	31bc	13a	45ab

<u>Treatment</u>	<u>Rate/ Acre</u>	<u>Potato psyllid/140 leaves</u>					
		<u>Jul 9</u>	<u>Jul 17</u>	<u>Jul 24</u>	<u>Aug 1</u>	<u>Aug 8</u>	<u>Aug 16</u>
Aastar 15G	20 lbs	3a	8a	2a	16a	9a	27a
DiSyston 15G	20 lbs	5a	3a	9a	6a	6a	14a
Furadan 15G	20 lbs	4a	6a	8a	61bc	61b	71c
Temik 15G	13.3 lbs	0a	2a	1a	22ab	38ab	69a
Thimet 20G	15 lbs	4a	0a	0a	16a	9a	31a
Untreated check		9a	38b	15a	82c	61b	65a

<u>Treatment</u>	<u>Rate/ Acre</u>	<u>Onion thrips/ 140 leaves*</u>		<u>Colorado potato** beetle/12 rows</u>
		<u>July 9</u>	<u>July 17</u>	
Aastar 15G	20 lbs	17ab	14a	127a
DiSyston 15G	20 lbs	22b	11c	117a
Furadan 15G	20 lbs	11a	6a	92a
Temik 15G	13.3 lbs	25b	19a	31a
Thimet 20G	15 lbs	24b	30a	120a
Untreated check		22b	33a	465b

*Total of four replications. Numbers followed by the same letter are not significantly different (P = 0.05) by Duncan's MRT.

**Total of four replications (30 row-ft). Numbers followed by the same letter are not significantly different by Duncan's MRT. Sample date August 19.

Whitney S. Cranshaw
Department of Entomology
Colorado State University
Fort Collins, Colorado 80523

POTATO INSECT CONTROL, CENTER, COLORADO, 1984: "Russet Burbank" potatoes were planted May 17 in an area adjacent to the San Luis Valley Research Center, Center, Colorado. Plots were single row (34-inch row spacing), 25' in length, separated by untreated guard rows. Plot design was a randomized complete block with 4 replications. Soil applied systemic insecticides were banded beneath the seed piece at planting. Foliar insecticides were applied July 12 using a CO² compressed air sprayer delivering 81 gals/acre. Plots were evaluated by randomly selecting 20 leaves/plot.

Insect populations were extremely low throughout the season and only 2 potato aphids/100 leaves were detected on untreated potatoes July 12. All foliar treatments, except PP321 and Thiodan effectively suppressed potato aphids for two and a half weeks following the first application. Green peach aphid control with Ambush, Thimet, and PP321 was poor on the final evaluation date (August 23), three weeks after the second foliar application. None of the treatments were phytotoxic to the plants.

Treatment	lbs (AI)/acre	Potato aphids/80 leaves			
		Jul 26	Jul 31	Aug 9	Aug 23
DiSyston 15G ^a	3.0	0a		0a	1a
Thimet 15G ^a	3.0	4a		4a	2a
Temik 15G ^a	3.0	0a		0a	0a
Monitor 4WM ^b	0.75		0a	0a	8ab
Thiodan 3E ^b	1.0		20b	6a	37b
Metasystox-R 2E ^b	0.5		0a	0a	3a
Pydrin 2.4E ^b	0.1		0a	0a	1a
Ambush 2E ^b	0.1		7a	13a	37b
PP321 1E ^b	0.01		69b	0a	12ab
Untreated check		59b	113c	119b	93c

Treatment	lbs (AI)/acre	Green peach aphids/80 leaves			
		Jul 26	Jul 31	Aug 9	Aug 23
DiSyston 15G ^a	3.0	0a		1a	1a
Thimet 15G ^a	3.0	1a		6a	35b
Temik 15G ^a	3.0	0a		0a	0a
Monitor 4WM ^b	0.75		0a	0a	2a
Thiodan 3E ^b	1.0		0a	3a	6a
Metasystox-R 2E ^b	0.5		1a	0a	2a
Pydrin 2.4E ^b	0.1		7ab	0a	0a
Ambush 2E ^b	0.1		1a	13ab	42b
PP321 1E ^b	0.01		0a	1a	19ab
Untreated check		5a	18b	49b	36b

Treatment	lbs (AI)/acre	Potato psyllid/80 leaves			
		Jul 26	Jul 31	Aug 9	Aug 23
DiSyston 15G ^a	3.0	0		0	0
Thimet 15G ^a	3.0	0		0	0
Temik 15G ^a	3.0	0		0	0
Monitor 4WM ^b	0.75		0	0	3
Thiodan 3E ^b	1.0		1	0	0
Metasystox-R 2E ^b	0.5		0	0	3
Pydrin 2.4E ^b	0.1		0	0	0
Ambush 2E ^b	0.1		2	0	2
PP321 1E ^b	0.01		1	0	0
Untreated check		9	2	3	14

^aPlanting time treatment (May 17)

^bFoliar treatment (July 12, 31)

. Original data; $\sqrt{x + 0.5}$ used for analysis. Numbers followed by the same letter are not significantly different (P = 0.05)

Whitney S. Cranshaw
Department of Entomology
Colorado State University
Fort Collins, CO 80523

CONTROL OF POTATO PSYLLID AND GREEN PEACH APHID, FORT COLLINS, 1984: "Norgold Russet" potatoes were planted May 25 at the C.S.U. Bay Farm, Fort Collins, CO. Plots were 5 row, 11' in length, separated by unplanted borders and arranged in a randomized complete block with 4 replications. Applications were made July 9 and July 27 using a CO² compressed air sprayer delivering 100 gal/acre. A higher rate (200 gals/acre) was used with soap sprays. Primary emphasis of the trial was an evaluation of products for potato psyllid control which were available to homeowners.

High variability between plots obscured differences in early evaluation dates. However, several products, including Ivory Dishwashing Liquid, appear effective against potato psyllid. Currently recommended insecticides, such as methoxychlor and carbaryl (Sevin), performed poorly for potato psyllid control. Carbaryl also sharply increased populations of green peach aphid throughout the trial. None of the treatments were phytotoxic to the plants.

Treatment	lbs (AI)/acre	Potato psyllid/80 leaves ^a			
		Jul 12	Jul 23	Jul 27	Aug 7
Diazinon AG500	1.0	1a	10a	0a	2a
Thiodan 3E	1.0	5a	24a	0a	14a
Pounce 3.2E	0.05	11a	7a	7a	6a
Orthene 75S	0.5	16a	18a	2a	17a
Pydrin 2.4E	0.05	29a	9a	3a	0a
Ambush 25W	0.05	54ab	16a	0a	3a
Ivory Dishwashing Liquid ^b		57ab	22a	7a	8a
San 410	1 qt	81ab	50a	26a	4a
Predalure ^c		95ab	17a	6a	2a
Untreated check		102ab	21a	10a	4a
Methoxychlor 2E	1.0	109ab	54a	9a	1a
Pyrenone ^d		124ab	21a	10a	5a
Safers Insecticidal Soap ^b		182b	25a	13a	0a
Sevin 80S	1.0	183b	38a	2a	2a
San 415	1 qt	189b	25a	19a	5a

Treatment	lbs (AI)/acre	Green peach aphid/80 leaves ^a			
		Jul 12	Jul 23	Jul 27	Aug 7
Orthene 75S	0.5	13a	11a	1a	4a
Thiodan 3E	1.0	29ab	51a	1a	3a
Diazinon AG500	1.0	43ab	34a	9a	2a
Pydrin 2.4E	0.05	55ab	111a	5a	2a
Pounce 3.2E	0.05	77ab	104a	11a	5a
Ambush 25W	0.05	189abc	131a	9a	2a
Untreated check		196abcd	12a	3a	0a
Predalure ^c		294abcde	7a	3a	3a
Pyrenone ^d		322bcd	11a	3a	2a
Ivory Dishwashing Liquid ^b		339bcdef	14a	0a	0a
Methoxychlor 2E	1.0	461cdefg	92a	10a	5a
San 410	1 qt	497defg	39a	10a	1a
San 415	1 qt	544efg	4a	2a	1a
Safers Insecticidal Soap		634fg	19a	0a	0a
Sevin 80S	1.0	750g	3238b	658b	532b

^aTotals of 4 replications. Numbers followed by the same letter are not significantly different (P = 0.05; DMRT)

^b40:1 dilution ratio at 200 gals/acre spray volume

^cTwice the labelled rate, dribbled over plants uniformly

^d3 oz of formulation/acre

Whitney S. Cranshaw
 Department of Entomology
 Colorado State University
 Fort Collins, CO 80523

CONTROL OF POTATO INSECTS WITH SOIL APPLIED SYSTEMIC INSECTICIDES, GREELEY, CO, 1984: "Norgold Russet" potatoes were planted May 15 at the Northern Colorado Research Center, Greeley, CO. Soil type was a sandy clay loam, 1.1% organic matter and a pH of 7.8. Plot size was 25 row-ft (30-inch row spacing), randomized in a complete block design with 4 replications. Insecticides were banded below the seed piece at planting. Insect counts were made July 9 by counting insects on 20 leaves/plot.

DiSyston, Temik, and Thimet significantly reduced green peach aphid populations. However, all carbamate treated plots (Temik, Furadan, Lance) had significantly higher potato psyllid populations than the untreated check. This latter phenomena is speculated to be due to poor control of the target pest and a destruction of hemipterous predators. No phytotoxicity was observed from any treatment.

<u>Treatment</u>	<u>Rate/ Acre</u>	<u>Insects/80 leaves (July 9)</u>	
		<u>Potato psyllid</u>	<u>Green peach aphid</u>
DiSyston 15G	20 lbs	3a	1a
Furadan 15G	20 lbs	23ab	54b
Lance 20G	15 lbs	69c	96b
Temik 15G	20 lbs	45bc	12a
Thimet 15G	20 lbs	2a	14a
Untreated check		9a	73b

Original data; $\sqrt{x + 0.5}$ used for analysis. Numbers followed by the same letter are not significantly different (P = 0.05; DMRT).

Whitney S. Cranshaw
Department of Entomology
Colorado State University
Fort Collins, CO 80523

CONTROL OF POTATO INSECTS WITH FOLIAR INSECTICIDES, GREELEY, CO, 1984: "Norgold Russet" potatoes were planted May 15 at the Northern Colorado Research Center in Greeley, Colorado. Plot size was single-row, 25' in length, separated by border rows and randomized in a complete block design with 3 replications. Treatments were applied July 17 and August 1 using a CO² compressed air sprayer delivering 108 gals/acre. Evaluations of potato psyllid and green peach aphid were made on four dates by sampling 20 leaves/plot. Colorado potato beetle larvae were evaluated August 1 by counting all larvae on the plants within a plot.

Under light pest pressure, generally good control was achieved by all treatments, with exceptions. Significantly higher green peach aphid populations occurred on Thiodan treated plots than on the untreated check one week after the first treatment. The Bacillus thuringiensis product San 410 (with exotoxin) appeared to control Colorado potato beetle, but San 415 did not. None of the treatments were phytotoxic.

Treatment	lbs (AI)/acre	Green peach aphid/60 leaves				Colorado potato beetles/ 75 row ft
		Jul 25	Aug 1	Aug 8	Aug 15	
Ambush 2E	0.1	3a	2a	1a	3a	1a
FMC 54800 2E	0.02	0a	1a	2a	5a	1a
FMC 54800 2E	0.04	0a	1a	1a	0a	0a
FMC 54800 2E	0.08	0a	0a	1a	5a	0a
Imidan 50W	2.0	5a	7a	1a	4a	0a
Monitor 4WM	0.75	1a	4a	1a	5a	4a
Pay-off 2.5E	0.1	2a	0a	0a	1a	0a
Pydrin 2.4E	0.1	0a	0a	0a	0a	0a
PP321 1E	0.01	0a	1a	0a	2a	0a
PP321 1E	0.015	5a	0a	0a	5a	0a
San 410	1 qt	16b	13b	5a	2a	0a
San 415	1 qt	4a	4a	1a	1a	14bc
Thiodan 3E	1.0	19b	6a	0a	5a	9ab
Untreated check		5a	7a	2a	4a	24c

Treatment	lbs (AI)/acre	Potato psyllid/60 leaves			
		Jul 25	Aug 1	Aug 8	Aug 15
Ambush 2E	0.1	3a	0a	2a	0a
FMC 54800 2E	0.02	1a	0a	0a	0a
FMC 54800 2E	0.04	0a	0a	0a	2a
FMC 54800 2E	0.08	0a	0a	0a	0a
Imidan 50W	2.0	0a	2a	0a	0a
Monitor 4WM	0.75	3a	1a	0a	4a
Pay-off 2.5E	0.1	0a	1a	0a	0a
Pydrin 2.4E	0.1	2a	0a	0a	0a
PP321 1E	0.01	1a	0a	0a	1a
PP321 1E	0.015	2a	0a	0a	0a
San 410	1 qt	4a	3a	2a	1a
San 415	1 qt	13a	2a	1a	0a
Thiodan 3E	1.0	7a	8a	0a	0a
Untreated check		46b	28b	15b	21b

Numbers followed by the same letter are not significantly different (P = 0.05; DMRT)

Whitney S. Cranshaw
 Department of Entomology
 Colorado State University
 Fort Collins, CO 80523

CONTROL OF POTATO INSECTS WITH SOAP SPRAYS, GREELEY, CO, 1984:
 "Norgold Russet" potatoes were planted May 15 at the Northern Colorado
 Research Center, Greeley, CO. Plot size was 3 row (30" spacing, 25'
 length), arranged in a randomized complete block design with three
 replications. Treatments were applied August 1 using CO² compressed
 air sprayer delivering 122 gals per acre. Soaps were diluted 40:1.
 Evaluations were made August 3. Potato psyllid and green peach aphids
 were counted from 20 leaves selected from the center row of each plot.
 All Colorado potato beetle larvae on the center row of each plot were
 counted.

Both soap sprays significantly reduced potato psyllid with Ivory
 Dishwashing Liquid showing superior activity. Neither treatment
 affected Colorado potato beetle larvae. Green peach aphid numbers were
 too low to detect treatment differences. None of the treatments were
 phytotoxic.

Treatment	Insects/60 leaves		
	Potato psyllid	Green peach aphid	Potato beetle larvae/ 75 ft row
Ivory Dishwashing Liquid (40:1)	6a	0a	29a
Safers Insecticidal Soap (40:1)	28b	7a	31a
Untreated check	57c	8a	31a

Treatments followed by the same letter were not significantly different
(P = 0.05; DMRT)

Whitney S. Cranshaw and
 David J. Liewehr
 Department of Entomology
 Colorado State University
 Fort Collins, CO 80523

Michael Thornton
 San Luis Valley Research Center
 Colorado State University
 Center, CO 81125

POTATO HERBICIDE/INSECTICIDE INTERACTION TRIAL, CENTER, CO, 1985:
 "Centennial" potatoes were planted May 3 at the San Luis Valley Research Center, Center, CO. Plots were 2-row, 10' in length arranged in a randomized complete block design with four replications. Insecticides were applied May 7 by banding over the row followed by light incorporation. Herbicides were applied June 13 when the plants were approximately 1' in height. Evaluation of plant injury was made July 3 using a 0 (no injury) to 5 (maximum injury observed, severe leaf burning) scale. Flower production was measured July 17 and August 8 by counting all flowers on the center two rows of each plot. Vigor ratings were also taken on these latter dates using a visual rating scale of 1 (least vigorous) to 5 (most vigorous).

All Sencor treated plots showed significant plant injury compared to non-Sencor treatments. Trends toward increased injury existed among Sencor treated plots that also received organophosphate insecticides (Thimet, DiSystem) but this was not significant. Significant reductions of flowering on the first evaluation date (July 17) resulted from Sencor-DiSystem interaction but not from Sencor alone. Temik significantly increased flowering on this date. Haulm growth (vigor) was suppressed on the second evaluation (August 8) by organophosphate insecticides (Thimet, DiSystem) but not by Sencor treatment.

<u>Treatment</u>	<u>Injury Rating</u>	<u>Flowers/80 row ft</u>		<u>Vigor rating</u>	
		<u>Jul 17</u>	<u>Aug 8</u>	<u>Jul 17</u>	<u>Aug 8</u>
Thimet-Sencor	2.41a	281bc	48a	3.58a	3.50a
DiSystem-Sencor	2.84a	190c	0a	3.50a	2.83b
Temik-Sencor	1.67a	758a	34a	4.25a	4.00a
Sencor	2.25a	336bc	39a	4.00a	3.67a
Thimet	0.00b	317bc	4a	3.67a	2.58b
DiSystem	0.00b	517b	0a	4.00a	2.75b
Temik	0.00b	926a	0a	4.25a	3.38ab
Untreated check	0.00b	398bc	0a	4.58a	3.67a

Whitney S. Cranshaw and
 David J. Liewehr
 Department of Entomology
 Colorado State University
 Fort Collins, CO 80523

Michael Thornton
 San Luis Valley Research Center
 Colorado State University
 Center, CO 81125

INSECTICIDE-HERBICIDE INTERACTION TRIAL, CENTER, CO., 1986:
 "Centennial" potatoes were planted May 2 to 34" rows at the San Luis Valley Research Center, Center, CO. Plots were 4-row, 20' in length, arranged in a randomized complete block with four replications. Soil applied systemic insecticides were applied May 19 as an incorporated band over the seed price. Insecticide rates were all at 3.0 lbs (AI)/acre. Sencor applications were made post-emergence (June 27) at a rate of 0.5 lb (a.i.). Evaluations of flowering were made July 21 by counting all flowers on the center two rows of each plot. Sencor damage ratings were based on a 0 (no damage) to 5 (maximum damage) rating scale. Severe chlorosis and some dieback of upper growth occurred on the most heavily damaged plots. Vigor ratings of haulm growth similarly used a rating system (1 = least vigorous, 4 = most vigorous). All plots were aerially sprayed with DiSyston on July 16 and July 30, and with Pydrin on July 10 and August 16. No insect populations capable of affecting potato growth occurred on the plots at any time. Vines were killed August 15 and plots hand harvested September 17.

All Sencor treated plots showed herbicide injury symptoms and an increase in herbicide injury was observed on Thimet treated plots. Both Thimet and DiSyston, regardless of herbicide treatment, suppressed flowering while significant increases in flowering were observed from Temik treatments. Thimet caused significant reduction in haulm vigor and yield on Sencor treated potatoes. Potatoes not receiving soil-applied systemic insecticide treatments showed increased vigor and yield following Sencor treatment.

Treatment	Flowers/ 160 row ft*	Sencor damage**		Vigor rating***		Yield (cwt/A)	
		7/14	8/8	7/21	8/8	Total	Marketable
Thimet	937	0.0	0.0	2.6	2.9	250.6a	207.6a
DiSyston	1226	0.0	0.0	3.1	3.2	250.1a	205.0a
Temik	2198	0.0	0.0	3.3	3.2	247.0a	206.0a
Untreated check	1809	0.0	0.0	2.5	2.8	225.5ab	178.9ab
Thimet-Sencor	744	4.4	3.4	2.4	2.1	169.6c	125.5c
DiSyston-Sencor	1118	1.8	2.1	3.1	3.3	227.0ab	190.1ab
Temik-Sencor	2307	3.2	2.1	3.3	3.4	195.3bc	155.8bc
Sencor	1905	2.0	1.5	3.6	3.9	243.4a	187.6ab

Numbers followed by the same letter are not significantly different (P = 0.05) by DMRT.

*Totals of 4 replications

**0 (no damage) - 5 (maximum injury) scale

***1 (least vigorous) - 4 (most vigorous) scale