

Antigo, Wisconsin, 2010 Field Day; Potato and Vegetable Insect Research

University of Wisconsin-Madison



Vegetable Crop Entomology



Extension and Research

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I. Best Management Practices for the Control of Potato Virus Y (PVY) Spread.

Best Mgmt Practices

(Foliar protectant, concentration
start date, application frequency)

		Plot Number	Flag Color
1) Russet	Untreated Control	(101, 201, 301, 401)	red
2) Norkotah	Aphoil, 2%, 2 July, 1X weekly	(102, 202, 302, 402)	white
3)	Stylect Oil, 0.75%, 2 July, 1X weekly	(103, 203, 303, 403)	blue
4)	Aphoil, 4%, 2 July, 2X weekly	(104, 204, 304, 404)	yellow
5)	Stylect Oil, 1.5%, 2 July, 2X weekly	(105, 205, 305, 405)	orange
6)	Requiem, 1.0%, 2 July, 2X weekly	(106, 206, 306, 406)	pink
7)	Stylect Oil, 0.75%, 2 July, 2X weekly	(107, 207, 307, 407)	green
8)	Aza-Direct, 2.0 pts/ac, 2 July, 2X weekly	(108, 208, 308, 408)	brown
	Aphoil, 2.0%, 2 July, 2X weekly		
	Aza-Direct, 2.0 pts/A, 2 July, 2X weekly		
9)	Requiem, 1.0%, 2 July, 2X weekly	(109, 209, 309, 409)	silver
	Aza-Direct, 2.0 pts/ac, 2 July, 2X weekly		
10)	Aphoil, 4%, 2 July, 2X weekly	(110, 210, 310, 410)	lime
	NNI-0101, 3.2 fl oz/A, 20 July, 1X weekly (3 applications – 7 day interval)		
11)	Aphoil, 4%, 5 June, 1X weekly	(111, 211, 311, 411)	violet
	Beleaf, 2.8 oz/A, 20 July, 1X weekly (3 applications – 7 day interval)		
12)	Aphoil, 4%, 2 July, 2X weekly	(112, 212, 312, 412)	2 red
	Fulfill, 3.67 fl oz/A, 20 July, 1X weekly (3 applications – 7 day interval)		

II. PVY Spread / Initial Inoculum Levels.

Treatment Number (Cultivar)	Initial Inoculum Level	Plot Number	Flag Color
1) R. Norkotah	Untreated Control	(101, 201, 301, 401)	red
2)	0.8% (1/120)	(102, 202, 302, 402)	white
3)	5% (6/120)	(103, 203, 303, 403)	blue
4)	10% (12/120)	(104, 204, 304, 404)	yellow
5) Snowden	Untreated Control	(105, 205, 305, 405)	orange
6)	0.8% (1/120)	(106, 206, 306, 406)	pink
7)	5% (6/120)	(107, 207, 307, 407)	green
8)	10% (12/120)	(108, 208, 308, 408)	brown
9) Dark Red Norland	Untreated Control	(109, 209, 309, 409)	orange
10)	0.8% (1/120)	(110, 210, 310, 410)	pink
11)	5% (6/120)	(111, 211, 311, 411)	green
12)	10% (12/120)	(112, 212, 312, 412)	brown

III. Colorado Potato Beetle; Neonicotinoid Statewide Insensitivity Survey (11 CPB Populations¹).

County	Site ID	Generation	($P < 0.0001$) ($= 0.05$)	Estimated slope (\pm SE)	LD ₅₀ (\pm 95% CL)	Resistance Ratio ²
Adams	A	1 st	($P = 0.0001$)	6.7% \pm 0.6	0.677 (0.322 – 0.927)	0.677 / 0.029 (23.3)
		1 st	($P = 0.0009$)	5.2% \pm 0.4	0.483 (0.218 – 0.551)	0.483 / 0.029 (16.7)
	C	1 st	($P = 0.0287$)	4.9% \pm 0.4	0.411 (0.153 – 0.790)	0.411 / 0.029 (14.2)
		2 nd	TBD	--	--	--
Columbia	D	1 st	($P = 0.0001$)	9.4% \pm 0.8	0.051 (0.018 – 0.088)	0.051 / 0.029 (1.8)
Langlade	E	2 nd	TBD	--	--	--
		2 nd	TBD	--	--	--
		2 nd	TBD	--	--	--
Portage	H	1 st	($P = 0.0245$)	7.2% \pm 0.6	0.582 (0.263 – 0.774)	0.582 / 0.029 (20.1)
		1 st	($P = 0.2294$)	9.1% \pm 0.8	0.693 (0.403 – 1.043)	0.693 / 0.029 (23.9)
		2 nd	TBD	--	--	--
Waushara	J	1 st	($P = 0.0761$)	6.6% \pm 0.6	1.32 (0.661 – 1.841)	1.32 / 0.029 (45.5)
		2 nd	TBD	--	--	--
		1 st	($P = 0.0205$)	8.2% \pm 0.7	0.942 (0.783 – 1.689)	0.942 / 0.029 (32.5)

¹ Special thanks to all cooperating growers and pest management practitioners for their assistance with the CPB insensitivity project (Mr. Randy Van Haren Pest Pros Inc., Plainfield, WI & Mr. Andy Merry, Antigo, WI, Mr. Anders Huseth, Department of Entomology)

² Resistance ratio estimates calculated against a New Jersey reference control strain of Colorado potato beetle adults (LD₅₀ = 0.029).

IV. Full Season – Reduced-Risk, Colorado Potato Beetle Control, Large Plot Demonstration Trials (2010 Hancock Agricultural Experiment Station, Field K9)

Treatments	Active Ingredient	Application Rates	Application Number	Plot Numbers	
<i>At-plant systemic programs (with neonicotinoids):</i>					
1)	Platinum® 75SG Voliam Xpress™	thiamethoxam chlorantraniliprole	2.67 oz / A 7.0 & 5.0 fl oz / A	1 (26 April) 2 (19 & 29 July)	(101, 201, 301)
2)	AdmirePro® Coragen® 1.67SC	imidacloprid rynaxypyr	8.7 fl oz / A 5.0 & 5.0 fl oz / A	1 (26 April) 2 (19 & 29 July)	(102, 202, 302)
3)	Coragen® 1.67SC Actara® 25WDG	rynaxypyr thiamethoxam	7.0 fl oz / A 3.0 & 1.5 oz. / A	1 (26 April) 2 (19 & 29 July)	(103, 203, 303)
4)	Belay® 2.13SC Voliam Xpress™	clothianadin chlorantraniliprole	12.0 fl oz / A 7.0 & 5.0 fl oz / A	1 (26 April) 2 (19 & 29 July)	(104, 204, 304)
5)	HGW86 20SC Actara® 25WDG	experimental thiamethoxam	13.5 fl oz / A 3.0 & 1.5 fl oz / A	1 (26 April) 2 (19 & 29 July)	(105, 205, 305)
6)	Platinum® 75SG Voliam Xpress™	thiamethoxam chlorantraniliprole	2.67 oz / A 7.0 & 5.0 fl oz / A	1 (26 April) 2 (19 & 29 July)	(106, 206, 306)
7)	A16901 40WG Voliam Xpress™	experimental chlorantraniliprole	10.0 fl oz / A 7.0 & 5.0 fl oz. / A	1 (26 April) 2 (19 & 29 July)	(107, 207, 307)
8)	Platinum® 75SG Voliam Xpress™	thiamethoxam chlorantraniliprole	2.67 oz / A 7.0 & 5.0 oz / A	1 (17 May) 2 (19 & 29 July)	(108, 208, 308)
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<i>Foliar programs (with neonicotinoids):</i>					
9)	Coragen® 1.67SC Assail® 30SG	rynaxypyr acetamiprid	5.0 & 5.0 fl oz / A 4.0 & 2.5 fl oz / A	2 (07 & 17 June) 2 (19 & 29 July)	(109, 209, 309)
10)	Radiant® SC Agri-Flex® 1.55SC	spinetoram abamectin + thiamethoxam	8.0 & 6.0 fl oz / A 0.79 & 0.6 fl oz / A	2 (07 & 17 June) 2 (19 & 29 July)	(110, 210, 310)
11)	Agri-Mek® 0.15EC Endigo® 2.06ZC	abamectin thiamethoxam + lambda-cyhalothrin	12.0 & 8.0 fl oz / A 4.0 & 2.5 fl oz / A	2 (07 & 17 June) 2 (19 & 29 July)	(111, 211, 311)
12)	Rimon® 0.83EC Coragen® 1.67SC	novaluron rynaxypyr	12.0 & 8.0 fl oz / A 5.0 & 3.5 fl oz / A	2 (07 & 17 June) 2 (19 & 29 July)	(112, 212, 312)
13)	Actara® 25WDG Agri-Mek® 0.75SC	thiamethoxam abamectin	3.0 & 1.5 oz / A 2.58 & 2.0 fl oz / A	2 (07 & 16 June) 2 (19 & 29 July)	(113, 213, 313)
14)	Coragen® 1.67SC Radiant® SC	rynaxypyr spinetoram	5.0 & 3.5 fl oz / A 8.0 & 6.0 fl oz / A	2 (07 & 17 June) 2 (19 & 29 July)	(114, 214, 314)
15)	Agri-Flex® 1.55SC Coragen® 1.67SC	abamectin + thiamethoxam rynaxypyr	0.79 & 0.6 fl oz / A 5.0 & 3.5 fl oz / A	2 (07 & 16 June) 2 (19 & 29 July)	(115, 215, 315)

V. Foliar Insecticide Evaluations for the Control of Colorado Potato Beetle, (2010 Hancock Agricultural Experiment Station, Hancock, WI Field C10)¹

Treatments	Active Ingredient	Application Rate	Plot Numbers	Treatments	Active Ingredient	Application Rate	Plot Numbers
1) UTC			(101, 201, 301, 401)	24)GWN-1970 + Scorpion	experimental + dinotefuran	1.33 lb & 2.0 oz / A	(124, 224, 324, 424)
2) Leverage	imidacloprid + cyfluthrin	2.4 oz / A	(102, 202, 302, 402)	25)GWN-1970 + GWN-1986	experimental	1.0 lb & 10.0 oz / A	(125, 225, 325, 425)
3) Leverage	imidacloprid + cyfluthrin	2.8 oz / A	(103, 203, 303, 403)	26)GWN-1970 + GWN-1971	experimental	1.33 lb & 1.25 oz / A	(126, 226, 326, 426)
4) Endigo	thiamethoxam + (Warrior II)	3.0 oz / A	(104, 204, 304, 404)	27)Scorpion	dinotefuran	2.0 oz / A	(127, 227, 327, 427)
5) HGW86 OD	experimental	3.38 oz / A	(105, 205, 305, 405)	28)Scorpion	dinotefuran	2.75 oz / A	(128, 228, 328, 428)
6) HGW 86 OD	experimental	6.76 oz / A	(106, 206, 306, 406)	29)Brigadier	imidacloprid + bifenthrin	4.8 fl oz / A	(129, 229, 329, 429)
7) HGW 86 OD	experimental	10.1 oz / A	(107, 207, 307, 407)	30) Brigadier	imidacloprid + bifenthrin	6.14 fl oz / A	(130, 230, 330, 430)
8) HGW86 OD	experimental	13.5 oz / A	(108, 208, 308, 408)	31) UTC			(131, 231, 331, 431)
9) Provado	imidicloprid	4.0 oz / A	(109, 209, 309, 409)	32) Actara	thiamethoxam	3.0 oz / A	(132, 232, 332, 432)
10) Coragen 1.67SC	rynaxypyr	3.45 oz / A	(110, 210, 310, 410)	33) Belay 2.13SC	clothianadin	2.8 fl oz / A	(133, 233, 333, 433)
11) Coragen 1.67SC	rynaxypyr	5.06 oz / A	(111, 211, 311, 411)	34) Warrior II	lambda-cyhalothrin	1.92 fl oz / A	(134, 234, 334, 434)
12) Coragen 1.67SC	rynaxypyr	7.0 oz / A	(112, 212, 312, 412)	35) Spintor 2SC	spinosad	6.0 fl oz / A	(135, 235, 335, 435)
13) Voliam Flexi	CTPR + thiamethoxam	4.0 oz / A	(113, 213, 313, 413)	36) Radiant	spinetoram	8.0 fl oz / A	(136, 236, 336, 436)
14) Voliam Xpress	CTPR + λ-cyhalothrin	7.0 oz / A	(114, 214, 314, 414)	37) Rimon 0.83EC	novaluron	12.0 fl oz / A	(137, 237, 337, 437)
15) Agri Flex	abamectin + thiamethoxam	0.79 oz / A	(115, 215, 315, 415)	38) Temprid 31.5SC	cyfluthrin	2.8 fl oz / A	(138, 238, 338, 438)
16)UTC			(116, 216, 316, 416)	39) Rimon + Warrior	novaluron + λ-cyhalothrin	12.0 fl oz & 3.84 oz / A	(139, 239, 339, 439)
17)Endigo	thiamethoxam + (Warrior II)	4.0 oz / A	(117, 217, 317, 417)	40) Rimon + Warrior	novaluron + λ-cyhalothrin	9.0 fl oz & 2.56 oz / A	(140, 240, 340, 440)
18)SXXX	experimental	5.2 oz / A	(118, 218, 318, 418)	41) Rimon	novaluron	9.0 fl oz / A	(141, 241, 341, 441)
19)SXXX	experimental	7.8 fl oz / A	(119, 219, 319, 419)	42) Rimon + Provado	novaluron + imidacloprid	12.0 fl oz + 3.76 oz / A	(142, 242, 342, 442)
20)Belay	clothianadin	2.0 oz / A	(120, 220, 320, 420)	43) Rimon + Provado	novaluron + imidacloprid	9.0 fl oz + 3.76 oz / A	(143, 243, 343, 443)
21)GWN-1970	experimental	1.33 lb / A	(121, 221, 321, 421)	44) Temprano	abamectin	8.0 fl oz / A	(144, 244, 344, 444)
22)GWN - 9883	experimental	0.545 gal / A	(122, 222, 322, 422)	45) Temprano	abamectin	12.0 fl oz / A	(145, 245, 345, 445)
23) GWN - 9883	experimental	1.09 gal / A	(123, 223, 323, 423)				

¹ Foliar insecticides applied with a 6' boom operating at 30 psi delivering 20.2 gpa through 3 flat-fan nozzles (8002VS-XR) spaced 18" apart. Two applications of each foliar insecticide applied 07 and 17 June, 2010.

VI. At-Plant, Systemic Insecticide Evaluations for the Control of Colorado Potato Beetle, (2010 Hancock Agricultural Experiment Station, Hancock, WI Field C25-26)¹

Treatments	Active Ingredient	Application Rate	Plot Numbers	Treatments	Active Ingredient	Application Rate	Plot Numbers
1) UTC			(101, 201, 301, 401)	16)UTC			(116, 216, 316, 416)
2) A16901 40WG	experimental	6.25 oz / A	(102, 202, 302, 402)	17)HGW86 200SC	experimental	9.0 g a.i. /100 kg	(117, 217, 317, 417)
3) A16901 40WG	experimental	10.0 oz / A	(103, 203, 303, 403)	18) HGW86 625FS	experimental	6.75 g a.i. /100 kg	(118, 218, 318, 418)
4) A9549 75 WG	experimental	1.68 oz / A	(104, 204, 304, 404)	19) HGW86 625FS	experimental	9.0 g a.i. /100 kg	(119, 219, 319, 419)
5) A9549 75 WG	experimental	2.66 oz / A	(105, 205, 305, 405)	20) HGW86 + Titan ST	experimental + clothianadin	6.75 & 6.25 g a.i. / 100 kg	(120, 220, 320, 420)
6) HGW86 600FS	experimental	4.56 fl oz / A	(106, 206, 306, 406)	21) HGW86 + Titan ST	experimental + clothianadin	9.0 & 6.25 g a.i. / 100 kg	(121, 221, 321, 421)
7) HGW86 200SC	experimental	10.3 fl oz / A	(107, 207, 307, 407)	22) HGW86 + Titan ST	experimental + clothianadin	6.75 & 3.125 g a.i. / 100 kg	(122, 222, 322, 422)
8) HGW86 200 SC	experimental	13.7 fl oz / A	(108, 208, 308, 408)	23) HGW86 + Admire Pro	experimental + imidacloprid	6.75 g a.i. & 0.26 fl oz/cwt	(123, 223, 323, 423)
9) Admire Pro	imidacloprid	7.0 fl oz / A	(109, 209, 309, 409)	24) HGW86 + Admire Pro	experimental + imidacloprid	9.0 g a.i. & 0.26 fl oz/cwt	(124, 224, 324, 424)
10) Admire Pro	imidacloprid	8.7 fl oz / A	(110, 210, 310, 410)	25) HGW86 600FS	experimental	9.0 g a.i. /100 kg	(125, 225, 325, 425)
11) Belay SC	clothianadin	12.0 fl oz / A	(111, 211, 311, 411)	26) Titan ST	clothianadin	6.25 g a.i. / A	(126, 226, 326, 426)
12) Belay + Moncoat	clothianadin + flutolanil	0.6 fl oz & 0.75 lb / cwt	(112, 212, 312, 412)	27) Admire Pro	imidacloprid	0.26 fl oz / cwt	(127, 227, 327, 427)
13) V-XXX	experimental	1.3 fl oz / cwt	(113, 213, 313, 413)	28) Admire Pro	imidacloprid	0.3 fl oz / cwt	(128, 228, 328, 428)
14) V-XXX	experimental	1.6 fl oz / cwt	(114, 214, 314, 414)	29) Cruiser	thiamethoxam	0.12 fl oz / cwt	(129, 229, 329, 429)
15) V-XXX	experimental	1.9 fl oz / cwt	(115, 215, 315, 415)	30) Cruiser	thiamethoxam	0.16 fl oz / cwt	(130, 230, 330, 430)

¹ Seed treatments were applied using a single-nozzle, overhead spray system on cut, suberized seed pieces of Russet Burbank 24 h prior to planting. In-furrow insecticide applications were applied in a 4" band over cut, suberized seed pieces placed in an open furrow using a CO₂ pressurized, backpack sprayer delivering 9.1 gpa at 30.0 psi with a single extended-range, flat-fan nozzle. Seed treatment applications were applied 25 April and in-furrow applications applied 26 April, 2010.

V. 2010, Additional Vegetable Insect Research.**I. Onion thrips (*Thrips tabaci*):**

- Controlling onion thrips using adjusted action thresholds and novel pest management products to meet resistance management guidelines and provide full-season control. Experiments also focusing on fungicide tank mixes and associated reductions in insect control. Experiments performed in cooperation with Shiprock Muck Farms, Coloma, WI.

II. European corn borer (*Ostrinia nubilalis*) and corn earworm (*Helicoverpa zea*):

- Improved application techniques for the control of European corn borer. Investigating the influence of seed treatment and soil-applied, water-soluble anthranilic diamides on the control of ECB in snap beans, sweet corn, and cabbage. Experiments performed in cooperation with Del Monte Foods and DuPont Crop Protection.

III. Mint bud mite (*Floridotarsonemus* spp.):

- Refining pest management recommendations and generating efficacy data for the control of mite and insect pests in peppermint. Experiments performed in cooperation with Bayer Crop Science in support of a 2009 A-priority rating of spiromesifen (Oberon[®]) under review with the Inter-regional Research Project 4, Minor Use Pesticide Registration.

IV. Striped cucumber beetle (*Acalymma vittatum*):

- Developing non-chemical, cultural pest management recommendations for the control of key insect and mite pests in cucurbit crops. Experiments performed in cooperation with Wisconsin Cooperative Extension Agents Bill Halfman, Monroe County, WI and supported by EPA Region V, American Farmland Trust.. (A) Compare the response of pest and beneficial arthropods, crop yield, and economic returns associated with reduced-risk practices versus conventional foliar spraying of insecticides in fruiting vegetables and cucurbits in a diversity of production systems, and (2) Determine the effect of different types of systemic insecticides applied to the roots of crops on the population biology and foraging behavior of native and domestic pollinators as well as non-target beneficial arthropods.