

Hancock Agricultural Experiment Station, 2011 Field Day; Potato and Vegetable Insect Research

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I. Colorado Potato Beetle; Neonicotinoid Statewide Insensitivity Among 7 Populations (Fig. 1)¹.

2011 Wisconsin Resistance Screen								
County	Population	n	Slope ± SEM	LD ₅₀ (95% CL)		χ ²	df	RR
Adams County	A	524	1.90 (± 0.26)	0.62	(0.407 - 0.937)	17.47	5	22
	B	524	1.81 (± 0.25)	0.39	(0.267 - 0.577)	15.78	5	14
Portage	A	525	1.49 (± 0.28)	0.72	(0.394 - 1.468)	25.94	5	26
	B	327	2.75 (± 0.51)	0.38	(0.239 - 0.878)	10.94	3	13
Waushara	A	500	2.03 (± 0.26)	0.73	(0.513 - 1.047)	14.15	4	26
	B	525	1.47 (± 0.11)	0.48	(0.395 - 0.588)	6.20	5	17
	C	425	1.63 (± 0.14)	0.72	(0.587 - 0.873)	5.63	4	25
Columbia	A.A.E.S	600	3.13 (± 0.33)	0.03	(0.028 - 0.034)	14.11	6	-

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 Huseeth, Department of Entomology)

² Resistance ratio estimates calculated against a Arlington Agricultural Experiment Station reference control strain of Colorado potato beetle adults (LD₅₀ = 0.03).

II. Full Season – Reduced-Risk, Colorado Potato Beetle Control, Large Plot Demonstration Trials (Hancock Agricultural Experiment Station, Field K17)

Treatments	Active Ingredient	Application Rates	Application Number	Plot Numbers	
<i>At-plant systemic programs (with neonicotinoids):</i>					
1)	Platinum [®] 75SC Radiant SC Voliam Xpress™ 1.25SC	thiamethoxam spinetoram chlorantraniliprole	2.67 fl oz / A 8.0 fl oz / A 9.0 & 7.5 fl oz / A	1 (28 April) 1 (20 June) 2 (TBD)	(101, 201, 301)
2)	AdmirePro [®] 550SC Radiant SC Temprano [®] 0.15EC	imidacloprid spinetoram abamectin	8.7 fl oz / A 8.0 fl oz / A 14 & 12 fl oz / A	1 (28 April) 1 (20 June) 2 (TBD)	(102, 202, 302)
3)	Coragen [®] 1.67SC Radiant [®] SC Admire Pro [®] 550SC	rynaxypyr spinetoram imidacloprid	7.0 fl oz / A 8.0 & 6.0 fl oz / A 1.3 & 1.3 fl oz / A	1 (28 April, 20 June) 2 (20 June, 6 July)	(103, 203, 303)
4)	Belay [®] 2.13SC Valent EXP	clothianadin experimental	12.0 fl oz / A 4.0 fl oz / A	1 (28 April) 2 (TBD)	(104, 204, 304)
5)	Dupont EXP Assail	experimental acetamiprid	13.5 fl oz / A 4.0 & 4.0 fl oz / A	1 (28 April) 2 (TBD)	(105, 205, 305)
6)	Syngenta EXP Agri-Mek™ 0.7SC	experimental abamectin	10 oz / A 3.5 & 2.75 fl oz / A	1 (28 April) 2 (TBD)	(106, 206, 306)
7)	Rimon [®] 0.83EC Actara [®] 25WDG	novaluron thiamethoxam	12.0 & 10.0 fl oz / A 3.0 oz & 2.0 fl oz. / A	1 (20 June, 6 July) 2 (TBD)	(107, 207, 307)
8)	Coragen [®] 1.67SC Assail [®] 30SG	rynaxypyr acetamiprid	5.0 & 3.5 fl oz / A 4.0 & 4.0 oz / A	1 (20 June, 6 July) 2 (TBD)	(108, 208, 308)
9)	Agri-Flex [®] 1.55SC Coragen [®] 1.67SC	abamectin + thiamethoxam rynaxypyr	8.5 & 5.5 fl oz / A 5.0 & 3.5 fl oz / A	1 (20 June, 6 July) 2 (TBD)	(109, 209, 309)
10)	Brigadier [®] 2EC Dupont EXP	imidacloprid + bifenthrin experimental	6.14 & 5.0 fl oz / A 10.1 & 6.76 fl oz / A	1 (20 June, 6 July) 2 (TBD)	(110, 210, 310)
11)	Radiant [®] SC Voliam Xpress™ 1.25SC	spinetoram chlorantraniliprole	8.0 & 6.0 fl oz / A 9.0 & 7.5 fl oz / A	1 (20 June, 6 July) 2 (TBD)	(111, 211, 311)
12)	Athena [®] 0.87EC Admire Pro [®] 550SC	bifenthrin + avermectin imidacloprid	17.0 & 14.0 fl oz / A 1.3 & 1.3 fl oz / A	1 (20 June, 6 July) 2 (TBD)	(112, 212, 312)
13)	Actara [®] 25WDG Voliam Xpress™ 1.25SC	thiamethoxam chlorantraniliprole	3.0 & 1.5 oz / A 7.0 & 5.0 fl oz / A	1 (20 June, 6 July) 2 (TBD)	(113, 213, 313)
14)	Agri-Mek™ 0.7SC Coragen [®] 40WG	abamectin rynaxypyr	3.5 & 2.75 fl oz / A 5.0 & 5.0 oz / A	1 (20 June, 6 July) 2 (TBD)	(114, 214, 314)
15)	Valent EXP Belay [®] 0.15EC	experimental clothianadin	4.3 & 4.0 fl oz / A 14.0 & 10.0 fl oz / A	1 (20 June, 6 July) 2 (TBD)	(115, 215, 315)

III. Foliar Insecticide Evaluations for the Control of Colorado Potato Beetle, (Hancock Agricultural Experiment Station, Hancock, WI Fields C8)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) Leverage 360	imidacloprid + cyfluthrin	2.8 oz / A	(102, 202, 302, 402)	17) Valent EXP	experimental	1.43 oz / A	(117, 217, 317, 417)
3) Dupont EXP	experimental	3.38 oz / A	(103, 203, 303, 403)	18) Valent EXP	experimental	2.86 oz / A	(118, 218, 318, 418)
4) Dupont EXP	experimental	6.76 oz / A	(104, 204, 304, 404)	19) Valent EXP	experimental	4.28 oz / A	(119, 219, 319, 419)
5) Dupont EXP	experimental	10.1 oz / A	(105, 205, 305, 405)	20) Belay 2.13SC	clothianadin	3.0 oz / A	(120, 220, 320, 420)
6) Provado 1.6SC	imidacloprid	3.8 oz / A	(106, 206, 306, 406)	21) Valent EXP + Belay	experimental + clothianadin	2.86 & 3.0 oz / A	(121, 221, 321, 421)
7) Coragen 1.67SC	chlorantraniliprole (CTPR)	4.5 oz / A	(107, 207, 307, 407)	22) Athena 0.87EC	bifenthrin + abamectin	13.0 oz / A	(122, 222, 322, 422)
8) Coragen 1.67SC	chlorantraniliprole	7.0 oz / A	(108, 208, 308, 408)	23) Athena 0.87EC	bifenthrin + abamectin	17.0 oz / A	(123, 223, 323, 423)
9) Voliam Flexi	CTPR + thiamethoxam	5.0 oz / A	(109, 209, 309, 409)	24) Brigadier 2SC	imidacloprid + bifenthrin	6.4 oz / A	(124, 224, 324, 424)
10) Agri-Mek 0.7SC	abamectin	2.57 oz / A	(110, 210, 310, 410)	25) Scorpion 35SL	dinotefuran	2.75 oz / A	(125, 225, 325, 425)
11) Agri-Flex	abamectin + thiamethoxam	5.55 oz / A	(111, 211, 311, 411)	26) Spintor 2SC	spinosad	6.0 oz / A	(126, 226, 326, 426)
12) Endigo 2.71ZC	thiamethoxam + λ cyhalo	4.0 oz / A	(112, 212, 312, 412)	27) Radiant SC	spinetorun	8.0 oz / A	(127, 227, 327, 427)
13) Endigo 2.06ZC	thiamethoxam + λ cyhalo	4.0 oz / A	(113, 213, 313, 413)	28) Rimon 0.83EC	novaluron	12.0 oz / A	(128, 228, 328, 428)
14) Warrior II	lambda-cyhalothrin	1.92 oz / A	(114, 214, 314, 414)	29) Fastac 2EC	alpha-cypermethrin	4.0 oz / A	(129, 229, 329, 429)
15) Actara 25WDG	thiamethoxam	3.0 oz / A	(115, 215, 315, 415)	30) Voliam Xpress	chlorantraniliprole + λ cyhalo	9.0 oz / A	(130, 230, 330, 430)

¹ Foliar insecticides applied with a 6' boom operating at 30 psi delivering 20.8 gpa through 3 flat-fan nozzles (8002VS-XR) spaced 18" apart. Two applications of each foliar insecticide applied 24 June and 1 July, 2011.

IV. At-Plant, Systemic Insecticide Evaluations for the Control of Colorado Potato Beetle, (Hancock Agricultural Experiment Station, Hancock, WI Field C21-23)¹.

Treatments	Active Ingredient	Application Rate	Plot Numbers	Treatments	Active Ingredient	Application Rate	Plot Numbers
1) UTC			(101, 201, 301, 401)	11) Syngenta EXP	experimental	6.5 oz / A	(111, 211, 311, 411)
2) Dupont EXP	experimental	0.47 fl oz / cwt	(102, 202, 302, 402)	12) Syngenta EXP	experimental	10.0 oz / A	(112, 212, 312, 412)
3) Dupont EXP	experimental	0.62 fl oz / cwt	(103, 203, 303, 403)	13) Platinum 75SG	thiamethoxam	1.68 oz / A	(113, 213, 313, 413)
4) Dupont EXP+ Cruiser	experimental + thiamethoxam	0.47& 0.12 oz /cwt	(104, 204, 304, 404)	14) Platinum 75SG	thiamethoxam	2.66 oz / A	(114, 214, 314, 414)
5) AdmirePro 4.6FS	imidacloprid	0.26 fl oz / cwt	(105, 205, 305, 405)	15) Dupont EXP	experimental	10.3 fl oz / A	(115, 215, 315, 415)
6) AdmirePro 4.6FS	imidacloprid	0.35 fl oz / cwt	(106, 206, 306, 406)	16) Dupont EXP	experimental	13.5 fl oz / A	(116, 216, 316, 416)
7) Cruiser 5FS	thiomethoxam	0.12 fl oz / cwt	(107, 207, 307, 407)	17) AdmirePro 4.6FS	imidacloprid	7.0 fl oz / A	(117, 217, 317, 417)
8) Cruiser 5FS	thiomethoxam	0.16 fl oz / cwt	(108, 208, 308, 408)	18) AdmirePro 4.6FS	imidacloprid	8.7 fl oz / A	(118, 218, 318, 418)
9) Belay 2.13SC	clothianadin	0.6 fl oz / cwt	(109, 209, 309, 409)	19) Belay 2.13SC	clothianadin	12.0 fl oz / A	(119, 219, 319, 419)
10)UTC			(110, 210, 310, 410)				

¹ Seed treatments were applied using an overhead spray system at the Hancock Agricultural Research Station 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 11.1 gpa at 30.0 psi with a single hollow-cone nozzle (TXVS-6). Seed treatment applications were applied 26 April and in-furrow applications applied 28 April, 2011.

VI. 2007, 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 performed in cooperation with Shiprock Farms, Coloma, WI.

II. European corn borer (*Ostrinia nubilalis*) and corn earworm (*Helicoverpa zea*) control in succulent snap bean:

- ❖ Improved application techniques for the control of European corn borer in succulent snap bean. Investigating the influence of soil-applied, water-soluble anthranilic diamides for the control of ECB in snap beans. Experiments performed in cooperation with Del Monte Foods, Plover, WI.

III. Aster leafhopper (*Macrostelus fascifrons*) and Root Knot Nematode Control in processing carrot:

- ❖ Controlling aster leafhopper using novel seed treatment technologies to meet resistance management guidelines and provide full-season control. Experiments performed in cooperation with Paul Miller Farms, Hancock, WI. Supplemental experiments to investigate nematicidal seed treatments for the control of NRKN in processing carrot.

IV. Current season management of Potato Virus Y (PVY) in seed potato production:

- ❖ Limiting the current season spread of PVY using novel foliar crop protectant technologies to meet certification requirements of the Wisconsin Certified Seed Potato Program. Experiments performed in cooperation with Langlade County Cooperative Extension, Antigo, WI.

V. Drip irrigation injection experiments for the control of Colorado Potato Beetle (CPB, *Leptinotarsa decimilimeata*):

- ❖ Evaluating candidate reduced-risk insecticides for the control of CPB delivered through drip irrigation injection. Experiments performed at the Hancock Agricultural Experiment Station, Hancock, WI.