Antigo Research Station Field Day, 2018

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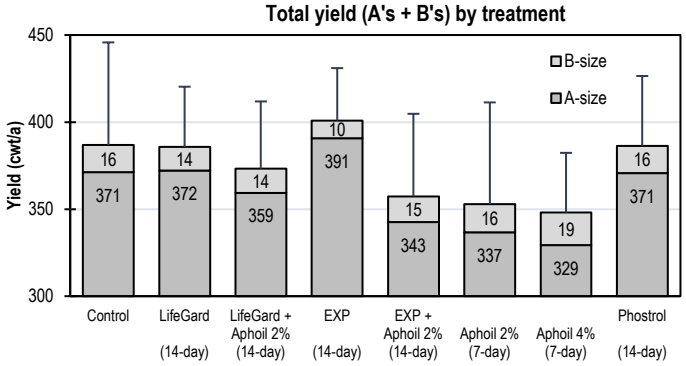
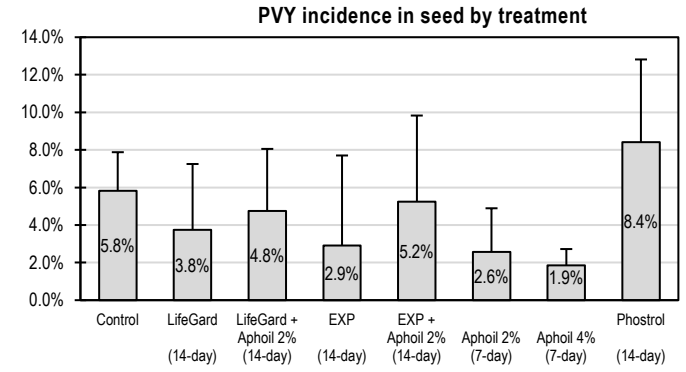
Evaluation of LifeGard and a new experimental product for management of PVY in seed potato production (Antigo; results from 2017)

This experiment was conducted at Antigo in 2017 to evaluate the ability of several treatment programs to limit the incidence of PVY in seed potato. Trial consisted of 7 treatments and one control arranged in a RCB design with four replicates. Potato cv. '*Silverton Russet*' seed pieces were machine planted June 8 in four-row plots measuring 12 ft. wide by 40 ft. long. Seed pieces were spaced 12 in. apart within rows. The center two rows of each plot were machine harvested on Oct 3 and tubers were graded as A's (> 1 7/8" dia.), B's (< 1 7/8" dia.), or culls (damaged or rotten tubers). Total weights were taken for each tuber class. Following harvest, a subsample of tubers were shipped to Oahu, Hawaii for a post-harvest evaluation. These tubers were planted as paired sets of rows and once they emerged and were approximately 14" in height, senior inspectors with the Wisconsin Seed Potato Certification Program visually inspected and evaluated the plants for symptoms of PVY infection. Yield and incidence results shown in the graphs below.





Evaluation of PureSpray Green as a PVY-management product in potato (Hancock)

This trial is being conducted at the Hancock Agricultural Research Station to evaluate PureSpray Green as a foliar treatment to limit the incidence of PVY in seed potato production. 10-12 applications of oil 7 day rotation were initiated 14 days after emergence. Spray frequency will be increased to 5 day interval later in the season. Vine kill will occur August. Applications will be made with 20 gallons of total spray volume per acre. Typical insecticide and fungicide rotations will be incorporated into the trial. Total yield will be recorded at harvest. PVY incidence will be evaluated by growing out a subset of tubers in Hawaii (see trial on left for methods).

Trt	Product	Rate	Unit	Timing
1	Control			
2	LifeGard	4.5	oz/100 gal	7 day
	PureSpray Green	2	% v/v	
3	LifeGard	4.5	oz/100 gal	14 day
	PureSpray Green	2	% v/v	
4	PureSpray Green	0.5	% v/v	7 day
5	PureSpray Green	0.75	% v/v	7 day
6	PureSpray Green	1	% v/v	7 day
7	JMS Stylet Oil	0.75	% v/v	7 day
8	JMS Stylet Oil	1.5	% v/v	7 day

Evaluation of foliar programs for aphid control in potato (Arlington)

Aphids feed on plant sap and excrete a sugary honeydew that attracts ants and creates the conditions for sooty mold. In addition to directly weakening the host plant, aphids are capable of vectoring several important viral plant diseases, including mosaic viruses and Potato Virus Y. Aphids that pose the most serious problem to Wisconsin vegetable production include the green peach and potato aphids. We conduct annual trials of novel experimental compounds and established commercial products for the control of aphid populations in potato production. This trial is located at the Arlington Agricultural Research Station. The table to the right details the treatment programs included in this year's aphid trial.

Trt	Product	Rate	
1	Control		
2	EXP 1	Low	
3	EXP 1	Med	
4	EXP 1	High	
5	Movento 240 SC	3.99	fl oz/a
6	Movento 240 SC	3.99	fl oz/a
7	Actara 25 WG	3	oz wt/a
8	Fulfill 50 SC	2.74	oz wt/a
9	EXP 2	Single	
10	EXP 3	Single	
11	Exirel 100 OD	20	fl oz/a
12	Sivanto 200 SL	10.5	fl oz/a
13	Transform 240 SC	1.5	fl oz/a
	FulFill 50 WG	2.8	oz wt/a
14	BeLeaf 50 SG	2.8	oz wt/a

dsRNAs for control of the Colorado potato beetle (Hancock)

Greenlight Biosciences (Medford, MA, www.greenlightbiosciences.com) has collaborated with our laboratory to perform field evaluations of novel, double-stranded RNA compounds targeting Colorado Potato Beetle. RNA interference is a relatively new technology in pest management, and works by suppressing the translation of specific RNA gene transcripts into proteins, effectively shutting down any genes matching the sequences of the dsRNA strands. In practice, dsRNA compounds are applied via foliar sprays and become active in the insect when consumed with plant tissue. This technology is especially promising because dsRNAs can be constructed that are extremely specific to a target pest and so are potentially much safer to humans and the environment than existing chemical pest management solutions. Trial consists of 10 treatments in four replicates.

Trt	Product	Rate	Mean total CPB per 10 plants				% DF (Jul 3)
			Adult	Egg mass	Sm larvae	Lg larvae	
1	NF	Low	2	2	139	55	4
2	AF + MSO	Low	12	3	96	59	3
3	NF	Med	5	3	54	17	3
4	AF + MSO	Med	4	3	72	13	3
5	AF + AtPlus	Med	6	2	73	47	3
6	CF	Med	12	3	91	25	4
7	NF	High	8	2	74	18	2
8	AF + MSO	High	3	2	36	19	2
9	Blackhawk 36 WDG	3.3 oz/a	3	3	25	7	2
10	Untreated		15	2	395	499	80

Systemic seed and at-plant insecticide evaluation (Hancock)

Systemic at-plant insecticides continue to play an important role in commercial pest management strategies in potato production. This trial evaluates the efficacy of seed treatments versus in-furrow applications of registered commercial and novel experimental compounds for the control of Colorado Potato Beetle, leafhoppers, and aphids. Trial was hand planted with potato cv. *'Russet Burbank'* on May 3, with in-furrow applications applied prior to row closure.

Trt	Product	App	Rate	Mean total CPB per 10 plants				% DF	Leafhopper		Aphid
				Adult	Egg m.	Sm larv.	Lg larv.		Adult	Nymph	
1	Control	-	-	11.0	10.0	236.5	450.5	60.3	23.3	12.0	1.0
2	Belay 2.13 SC	In-furrow	12 fl oz/a	17.8	9.8	24.3	19.0	7.5	5.3	0.5	0.3
3	Belay 2.13 SC	Seed	0.5 fl oz/cwt	15.0	15.3	45.8	14.5	7.3	5.3	1.5	0.3
4	Verimark 1.67 SC	Seed	0.7 fl oz/cwt	14.3	19.8	171.8	207.5	30.5	20.8	18.0	0.5
5	Verimark 1.67 SC	In-furrow	13 fl oz/a	17.3	16.3	67.3	31.8	7.5	28.0	20.8	0.5
6	EXP 1	In-furrow	Low	8.3	8.5	9.3	8.0	6.5	25.5	11.8	3.3
7	EXP 1	In-furrow	Med	6.5	6.3	0.0	0.0	4.8	9.8	2.3	0.5
8	EXP 1	In-furrow	High	4.8	3.5	2.8	4.3	5.3	25.3	2.5	0.5
9	EXP 1	Seed	Low	10.0	6.5	15.8	20.8	6.5	17.3	6.5	1.0
10	EXP 1	Seed	Med	7.0	9.3	4.3	4.0	5.0	11.8	3.3	0.3
11	EXP 1	Seed	High	6.5	2.0	0.0	0.3	5.3	7.8	0.3	0.5
12	EXP 2	In-furrow	Low	7.8	8.8	0.0	0.0	5.3	12.8	0.3	1.3
13	EXP 2	In-furrow	High	6.0	1.5	2.8	0.0	4.8	8.8	1.0	0.3
14	EXP 2	Seed	Low	6.8	3.8	8.0	0.0	4.8	13.5	4.0	0.5
15	EXP 2	Seed	High	7.5	2.3	0.0	0.3	5.0	13.0	0.5	0.5

Full-season reduced-risk CPB control: Large plot demo (Hancock)

It is critically important to frequently rotate chemical insecticides used in the control of Colorado Potato Beetle, as this insect has the ability to rapidly develop resistance after repeated exposures to insecticides with common modes of action. This trial is a demonstration of several different insecticide rotations which will ensure season-long control of Colorado Potato Beetle while reducing the risk of resistance development. Potato cv. *'Russet Burbank'* machine planted May 4, with at-plant insecticides administered at planting.

	Trt	Target	Delivery	App date	Week	Product	Rate	Registrant	Active Ingredient	IRAC	Class
At-plant systemic programs	1	1st gen	Seed	May 4	1	Verimark 1.67 SC	0.62 fl oz/cwt	DuPont	Cyantraniliprole	28	Diamides
			Foliar	Jun 20	8	Agri-Mek 0.7 SC	3.5 fl oz/a	Syngenta	Abamectin	6	Avermectins
		2nd gen	Foliar	Jul 6	10	Torac 1.29 EC	21 fl oz/a	Nichino	Tolfenpyrad	21A	METI insecticides
			Foliar	Jul 16	12	Torac 1.29 EC	17 fl oz/a	Nichino	Tolfenpyrad	21A	METI insecticides
	2	1st gen	Seed	May 4	1	AdmirePro 4.6 FS	0.35 fl oz/cwt	Bayer	Imidacloprid	4A	Neonicotinoids
			Foliar	Jun 20	8	Agri-Mek 0.7 SC	3.5 fl oz/a	Syngenta	Abamectin	6	Avermectins
		2nd gen	Foliar	Jul 6	10	Belay 2.13 SC	3 fl oz/a	Valent	Clothianidin	4A	Neonicotinoids
			Foliar	Jul 16	12	Belay 2.13 SC	2.5 fl oz/a	Valent	Clothianidin	4A	Neonicotinoids
	3	1st gen	Seed	May 4	1	Cruiser 5 FS	0.16 fl oz/cwt	Syngenta	Thiamethoxam	4A	Neonicotinoids
			Foliar	Jun 20	8	Agri-Mek 0.7 SC	3.5 fl oz/a	Syngenta	Abamectin	6	Avermectins
		2nd gen	Foliar	Jul 6	10	Besiege 1.25 ZC	9 fl oz/a	Syngenta	Chlorantraniliprole Lambda-cyhalothrin	28 3	Diamides Pyrethroids
			Foliar	Jul 16	12	Besiege 1.25 ZC	7.5 fl oz/a	Syngenta	Chlorantraniliprole Lambda-cyhalothrin	28 3	Diamides Pyrethroids
	4	1st gen	In-furrow	May 4	1	Platinum 75 SG	2.67 oz wt/a	Syngenta	Thiamethoxam	4A	Neonicotinoids
			Foliar	Jun 20	8	Agri-Mek 0.7 SC	3.5 fl oz/a	Syngenta	Abamectin	6	Avermectins
		2nd gen	Foliar	Jul 6	10	Torac 1.29 EC	21 fl oz/a	Nichino	Tolfenpyrad	21A	METI insecticides
			Foliar	Jul 16	12	Torac 1.29 EC	17 fl oz/a	Nichino	Tolfenpyrad	21A	METI insecticides
	5	1st gen	In-furrow	May 4	1	Verimark 1.67 SC	13.5 fl oz/a	DuPont	Cyantraniliprole	28	Diamides
			Foliar	Jun 20	8	Agri-Mek 0.7 SC	3.5 fl oz/a	Syngenta	Abamectin	6	Avermectins
		2nd gen	Foliar	Jul 6	10	Actara 25 WDG	3 oz wt/a	Syngenta	Thiamethoxam	4A	Neonicotinoids
			Foliar	Jul 16	12	Actara 25 WDG	2.5 oz wt/a	Syngenta	Thiamethoxam	4A	Neonicotinoids
	6	1st gen	In-furrow	May 4	1	AdmirePro 4.6 FS	8.7 fl oz/a	Bayer	Imidacloprid	4A	Neonicotinoids
			Foliar	Jun 20	8	Agri-Mek 0.7 SC	3.5 fl oz/a	Syngenta	Abamectin	6	Avermectins
		2nd gen	Foliar	Jul 6	10	Coragen 1.67 SC	7.5 fl oz/a	DuPont	Chlorantraniliprole	28	Diamides
			Foliar	Jul 16	12	Coragen 1.67 SC	5 fl oz/a	DuPont	Chlorantraniliprole	28	Diamides
Foliar programs	7	1st gen	Foliar	Jun 13	7	Minecto Pro 1.37 SC	10 fl oz/a	Syngenta	Cyantraniliprole Abamectin	28 6	Diamides Avermectins
			Foliar	Jun 20	8	Minecto Pro 1.37 SC	8.5 fl oz/a	Syngenta	Cyantraniliprole Abamectin	28 6	Diamides Avermectins
		2nd gen	Foliar	Jul 6	10	Assail 30 SG	4 oz wt/a	UPI	Acetamiprid	4A	Neonicotinoids
			Foliar	Jul 16	12	Assail 30 SG	3.5 oz wt/a	UPI	Acetamiprid	4A	Neonicotinoids
	8	1st gen	Foliar	Jun 13	7	Assail 30 SG	4 oz wt/a	UPI	Acetamiprid	4A	Neonicotinoids
			Foliar	Jun 20	8	Assail 30 SG	3.5 oz wt/a	UPI	Acetamiprid	4A	Neonicotinoids
		2nd gen	Foliar	Jul 6	10	Minecto Pro 1.37 SC	10 fl oz/a	Syngenta	Cyantraniliprole Abamectin	28 6	Diamides Avermectins
			Foliar	Jul 16	12	Minecto Pro 1.37 SC	8.5 fl oz/a	Syngenta	Cyantraniliprole Abamectin	28 6	Diamides Avermectins
	9	1st gen	Foliar	Jun 13	7	Blackhawk 36 WG	3.3 oz wt/a	Dow	Spinosad	5	Spinosyns
			Foliar	Jun 20	8	Blackhawk 36 WG	3 oz wt/a	Dow	Spinosad	5	Spinosyns
		2nd gen	Foliar	Jul 6	10	Besiege 1.25 ZC	9 fl oz/a	Syngenta	Chlorantraniliprole Lambda-cyhalothrin	28 3	Diamides Pyrethroids
			Foliar	Jul 16	12	Besiege 1.25 ZC	7.5 fl oz/a	Syngenta	Chlorantraniliprole Lambda-cyhalothrin	28 3	Diamides Pyrethroids
	10	1st gen	Foliar	Jun 13	7	Torac 1.29 EC	21 fl oz/a	Nichino	Tolfenpyrad	21A	METI insecticides
			Foliar	Jun 20	8	Torac 1.29 EC	17 fl oz/a	Nichino	Tolfenpyrad	21A	METI insecticides
		2nd gen	Foliar	Jul 6	10	Coragen 1.67 SC	7.5 fl oz/a	DuPont	Chlorantraniliprole	28	Diamides
			Foliar	Jul 16	12	Coragen 1.67 SC	5 fl oz/a	DuPont	Chlorantraniliprole	28	Diamides