2017 Langlade Agricultural Research Station Field Day

Potato and Vegetable Insect Research

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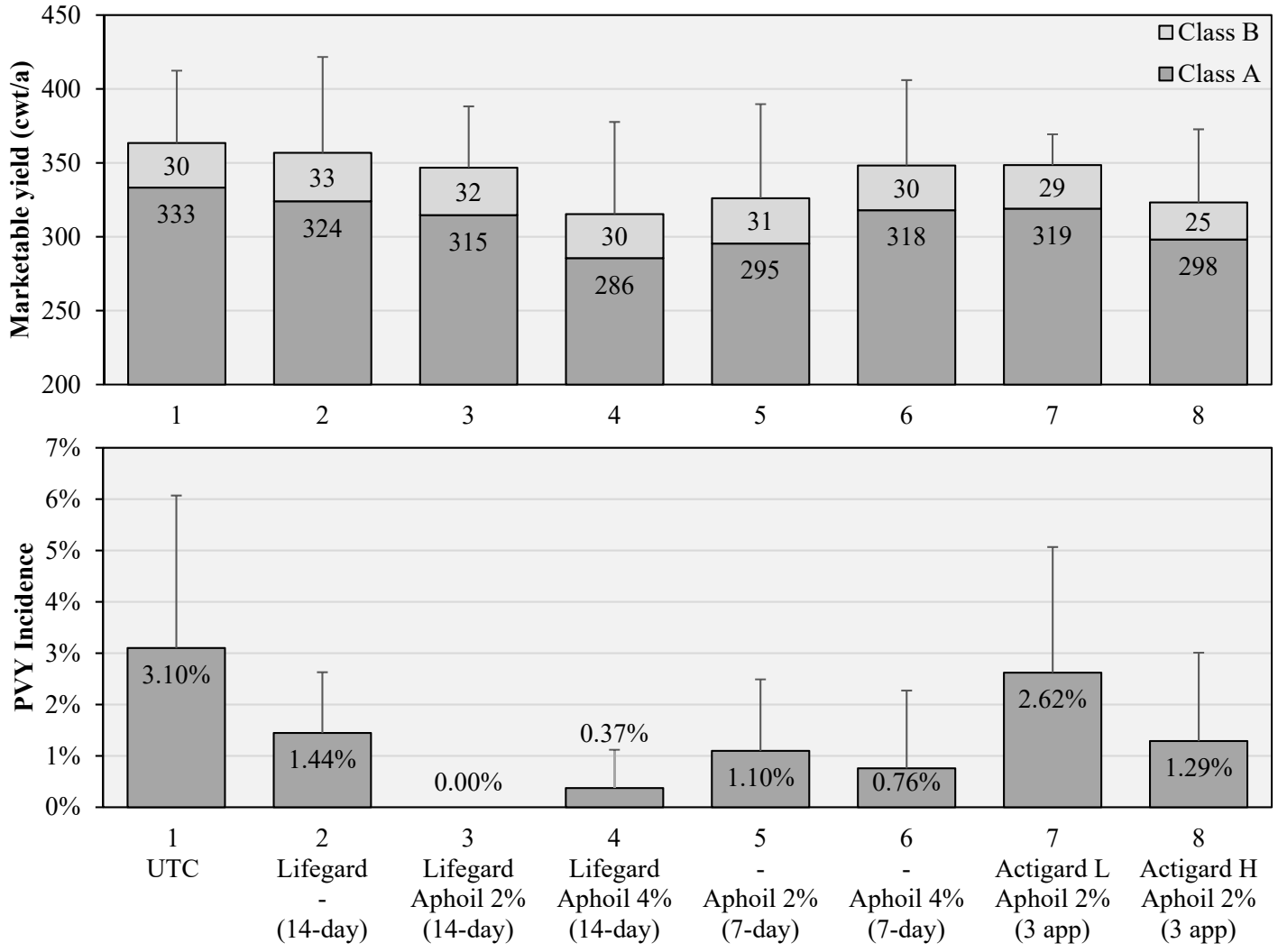
I. PVY Management in Seed Potato Production: Results from 2016 (Antigo)

The trial consisted of seven main effect treatments and one untreated control arranged in a RCB design with four experimental replicates. Treatments consisted of an untreated control; the compound Lifegard alone and in combination with two rates of Aphoil; two rates of Aphoil alone; and two rates of the product Actigard in combination with a single rate of Aphoil.

Experimental plots consisted of four row plots measuring 12 ft. (3.7 m) wide and 40 ft. (12.2 m) in length with unplanted guard rows on each side. Potato *Solanum tuberosum* L., 'Silverton Russet' was machine planted on 20 June, 2016 at the Langlade Agricultural Research Station in Antigo, north central Wisconsin. Rows were planted on 36-inch row centers (0.9 m) with 12 inches (0.3 m) between plants and 12 ft. (3.6 m) alleys separating replications.

Trt	Product	Form.			Rate		App. Freq.
1	UTC	-			-		-
2	Lifegard	100	%	WP	1.78	oz wt/a	14 days
3	Lifegard	100	%	WP	1.78	oz wt/a	14 days
	Aphoil	100	%	SL	2	% v/v	
4	Lifegard	100	%	WP	1.78	oz wt/a	14 days
	Aphoil	100	%	SL	4	% v/v	
5	Aphoil	100	%	SL	2	% v/v	7 days
6	Aphoil	100	%	SL	4	% v/v	7 days
7	Actigard	50	%	WG	0.75	oz wt/a	3 total
	Aphoil	100	%	SL	2	% v/v	
8	Actigard	50	%	WG	1	oz wt/a	3 total
	Aphoil	100	%	SL	2	% v/v	



II. Evaluation of Registered and Experimental Foliar Insecticides for the Control of Colorado Potato Beetle 1st Generation (Hancock ARS)

This trial is conducted annually to evaluate the efficacy of standard rates of registered and experimental foliar insecticides applied to early instar larvae of the first generation of Colorado potato beetle *(Leptinotarsa decemlineata)*, and potato leafhopper adults *(Empoasca fabae)*. Treatments were applied on either two or three dates, as indicated on the right side of the table.

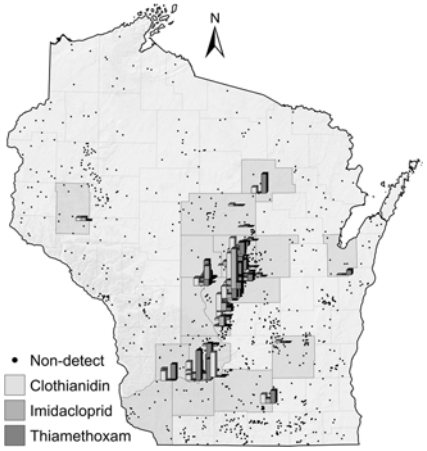
Trt	Product	Form.	Rate	Adj.[a]	Trt Date		
					7-Jun	14-Jun	21-Jun
1	Minecto Pro	163.5 SC	6 fl oz/a	A90	-	X	X
2	Minecto Pro	163.5 SC	8 fl oz/a	A90	-	X	X
3	Minecto Pro	163.5 SC	10 fl oz/a	A90	-	X	X
4	Blackhawk	36 WG	3.3 oz wt/a	A90	-	X	X
5	Besiege	150 ZC	9 fl oz/a	A90	-	X	X
6	Exirel	100 SE	10 fl oz/a	A90	-	X	X
7	Agri-Mek	84 SC	3 fl oz/a	A90	-	X	X
8	EXP 1		A (low)	-	X	X	X
9	EXP 1		B	-	X	X	X
10	EXP 1		C	-	X	X	X
11	EXP 1		D (high)	-	X	X	X
12	- CONTROL 1 -				-	-	-
13	Coragen	1.67 SC	7.5 fl oz/a	MSO	-	X	X
14	Rimon	0.83 EC	10 fl oz/a	A90	X		
	Rimon	0.83 EC	7 fl oz/a	A90	-	X	X
15	AdmirePro	4.6 SC	1.3 fl oz/a	A90	-	X	X
16	EXP 2		A	LI-700	X	X	X
17	- Adjuvant only -			LI-700	X	X	X
18	EXP 2		A	LI-700	X	X	X
19	EXP 2		A	LI-700	X	X	X
	+ Boric Acid	100 WSG	0.25 % w/w		X	X	X
20	EXP 2		A	LI-700	X	X	X
	+ Boric Acid	100 WSG	0.5 % w/w		X	X	X
21	Boric Acid	100 WSG	0.25 % w/w	LI-700	X	X	X
22	Boric Acid	100 WSG	0.5 % w/w	LI-700	X	X	X
23	- cancelled -				-	-	-
24	Trident	14.32 LC	3 qt/a		X	X	X
25	Trident	14.32 LC	6 qt/a		X	X	X
26	- CONTROL 2 -				-	-	-
27	Athena	0.87 EC	17 fl oz/a	A90	-	X	X
28	Harvanta	50 SL	16.4 fl oz/a	A90	-	X	X
29	Grandevo	70 WG	3 lb/a	NFP	X	X	X
30	Venerate XC	94.46 SL	8 qt/a	NFP	X	X	X

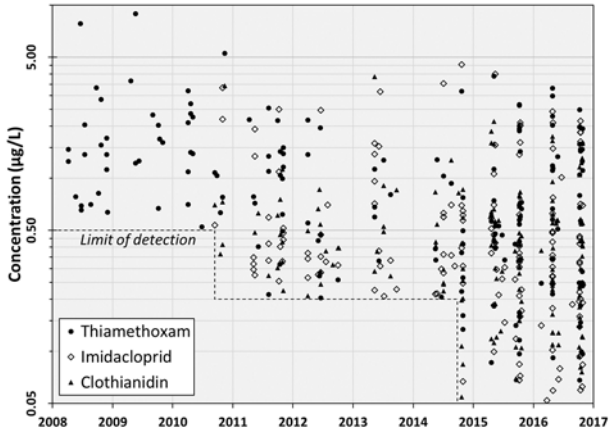
a. Adjuvant abbreviations: A90=Activator 90; NFP=NuFilm P. Activator 90 and LI-700 added at 0.1% v/v. MSO and NuFilm P added at 0.25% v/v.

Potato cv. 'Yukon Gold' machine planted April 17. Treatments were applied with a CO_2 pressurized backpack sprayer with a 6 ft boom operating at 30 psi delivering 20 gpa through 4 flat-fan nozzles (Tee Jet XR8002) spaced 18" apart while travelling at 3.5 ft / sec.

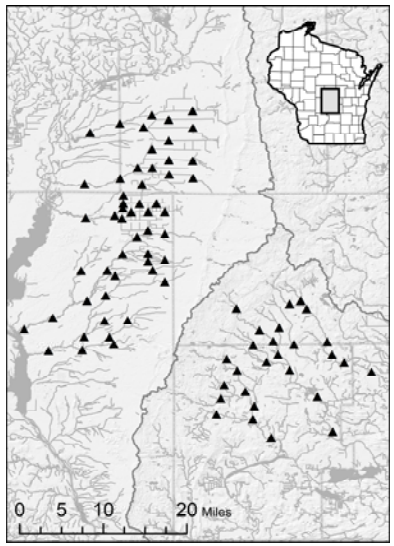
III. Groundwater quality evaluations

Systemic neonicotinoid insecticides are commonly used in vegetable production in central Wisconsin and across the United States, but high usage volumes of this class of water-soluble insecticides has raised questions about their accumulation in groundwater resources. Since 2008, the Wisconsin Department of Agriculture, Trade and Consumer Protection has been testing for neonicotinoid insecticides as part of their standard battery of water quality tests in groundwater monitoring wells and private potable well samples.





We have been investigating these data as part of our lab's water quality focus. As seen in the figure at left, the bulk of reported neonicotinoid detections are found in the Central Sands and lower Wisconsin River valley, both regions containing sandy, fast-draining soils, shallow aquifers, and frequent applications of neonicotinoid compounds. In the figure at right, individual detections are shown over time.



IV. Surface water quality evaluations

Groundwater monitoring efforts, both in our lab and at the Department of Ag (see Section III), show that neonicotinoid groundwater contaminants are found throughout central Wisconsin. Many of the surface water streams in central Wisconsin are in fact groundwater-fed, raising concerns that both agricultural runoff and groundwater inflow may lead to neonicotinoid insecticides appearing in streams and rivers in the area, which poses a risk for aquatic invertebrates that form the basis of the food chains in these environments, many of which are cherished trout-fishing streams.

To better understand the extent of contamination in groundwater-fed streams within central Wisconsin's vegetable producing regions we aim to describe the spatial distribution of contaminants and track changes in such contaminants within and between years. We also aim to describe factors that contribute to these characteristics, such as differences in agricultural intensity in the surrounding watersheds. We are monitoring five streams in the Central Sands, a region of relatively intensive agriculture, as well as several river systems in the relatively less agriculturally intense Fox River watershed to the southeast of the Central Sands. Broadening our understanding of the transport and environmental fate neonicotinoids, in addition to updating the current profile of affected aquatic invertebrates will allow us to better weigh the risks and environmental impacts associated with the heavy usage of these agro-chemicals.