Seed Treatments for Wireworm Control in Field Corn

Michelle Leinfelder-Miles

Delta Farm Advisor, San Joaquin County

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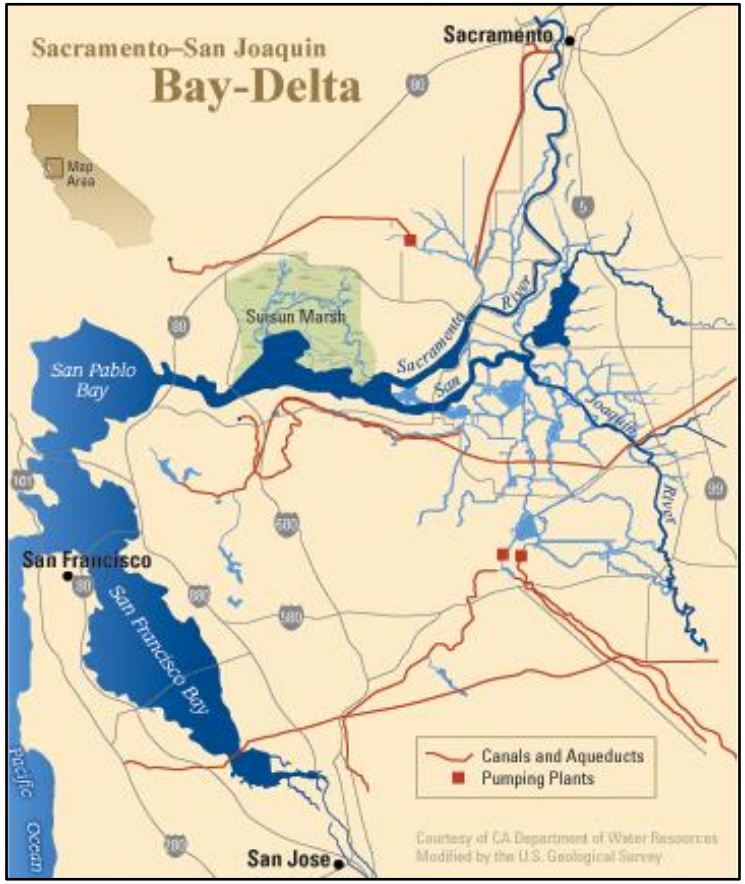
Background

Wireworms (Limonius spp.) are the larvae of click beetles.

Background


Sacramento–San Joaquin
Bay-Delta
Sacramento
Map Area
Suisun Marsh
San Pablo Bay
Sacramento River
San Joaquin River
San Francisco
San Francisco Bay
Pacific Ocean
San Jose
Canals and Aqueducts
Pumping Plants
Courtesy of CA Department of Water Resources
Modified by the U.S. Geological Survey

Methods

Product	Company	Active Ingredient	Chemistry Class	Rate
Lumivia™	DuPont	Chlorantraniliprole	Anthranilic Diamide	250 µg a.i./seed
Lumivia™	DuPont	Chlorantraniliprole	Anthranilic Diamide	500 µg a.i./seed
Lumivia™	DuPont	Chlorantraniliprole	Anthranilic Diamide	750 µg a.i./seed
PPST 250 + Lumivia™	DuPont	PPST 250 + Chlorantraniliprole	Neonicotinoid + Anthranilic Diamide	250 µg a.i./seed + 250 µg a.i./seed
PPST 250 + Lumivia™	DuPont	PPST 250 + Chlorantraniliprole	Neonicotinoid + Anthranilic Diamide	250 µg a.i./seed + 500 µg a.i./seed
Poncho®	Bayer CropScience	Clothianidin	Neonicotinoid	500 µg a.i./seed
Poncho® Votivo®	Bayer CropScience	Clothianidin + Bacillus firmus I-1582	Neonicotinoid + biological	1250 µg a.i./seed
Cruiser®	Syngenta	Thiamethoxam	Neonicotinoid	250 micrograms a.i./seed
Control	N/A	N/A	N/A	N/A

Results

Photo courtesy of Stephen Colbert, DuPont

Results

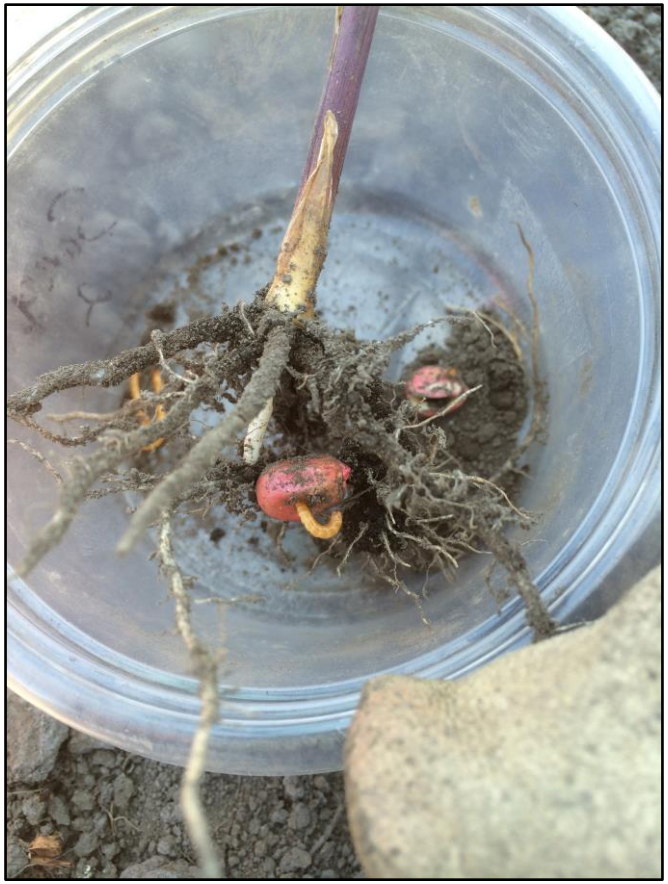


Photo courtesy of Stephen Colbert, DuPont

Date:	All Dates (Weekly from June 5th to July 2nd)									
Treatment	Stand Count (# plants/10 feet)		Vigor (Cruiser® is standard, 5)		Damaged Plants (#/25 plants)		Dead Plants (#/25 plants)		Height (inches)	
Lumivia™ 250	16.75	bc	3.7	ef	6.31	bc	1.18	ab	32.3	de
Lumivia™ 500	16.75	abc	3.9	def	4.83	cd	0.73	bc	30.1	e
Lumivia™ 750	17.7	ab	4.5	cde	3.33	cd	0.33	c	34.3	cd
PPST 250 + Lumivia™ 250	18.2	ab	4.7	bcd	4.39	cd	0.49	c	37.4	bc
PPST 250 + Lumivia™ 500	18.65	a	5.7	ab	2.51	d	0.42	c	40.2	ab
Poncho® Votivo®	18.2	ab	5.7	ab	4.38	cd	0.18	c	40	ab
Poncho®	15.2	c	6.2	a	9.94	a	0.1	c	41.9	a
Cruiser®	16.65	bc	5	abc	8.56	ab	0.64	bc	38.2	b
Untreated control	15.65	c	3.1	f	5.51	bc	3.33	a	32.5	de
Treatment P value	**<0.0001**		**<0.0001**		**<0.0001**		**<0.0001**		**<0.0001**	
Standard Error	0.5		0.42		1.69		0.32		1.65	

Treatment	Total Plants (# plants per harvested area)		Moisture (%)	Plot Yield at 15% Moisture (lbs/acre)
Lumivia™ 250	61	ab	13.2	8348
Lumivia™ 500	59	ab	13.4	8934
Lumivia™ 750	66	ab	12.9	9849
PPST 250 + Lumivia™ 250	66	ab	12.8	9070
PPST 250 + Lumivia™ 500	74	a	12.7	10376
Poncho® Votivo® 1250	69	a	12.8	9494
Poncho® 500	72	a	12.3	10005
Cruiser® 250	69	a	12.9	9652
Untreated Control	50	b	13.1	8373
Treatment P value	**0.0016**		**0.4704**	**0.3413**
Standard Error	3.55		0.38	737

Summary

- Wireworms are the soil-dwelling larvae of click beetles, and they are a pest of field corn in the Sacramento-San Joaquin River Delta region.
- In 2014, we studied eight seed treatments against an untreated control for efficacy against wireworms.
- Three of the treatments are commercially available, and the other five treatments are different rates and combinations of a new product.

Summary

- We evaluated growth and harvest parameters and found:
  - PPST 250 + Lumivia™ 500 outperformed the control in five growth paraments.
  - Poncho® Votivo® and PPST 250 + Lumivia 250™ outperformed the control in four growth parameters.
  - There were no statistical differences among treatments for harvest weight, but both PPST 250 + Lumivia™ 500 and Poncho® yielded over 5 tons/acre.

Summary

- These results indicate that growers have several options for wireworm control.
- When selecting for products, growers should consider their wireworm pressure and other soil-dwelling pest pressure.
- Growers should consider what products they have been using in the past and whether it is time to rotate to a different chemistry for insect resistance management.

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Thank you!

Michelle Leinfelder-Miles

(209) 953-6120

mmleinfeldermiles@ucanr.edu

http://ucanr.edu/sites/deltacrops/