Title: *Fall Pest Management Meeting*

Sponsor: *University of Arizona*

Date: *8-11-04*

Location: *Yuma Civic and Convention Center*

Fall Produce Insect Pest Management Review

John C. Palumbo

Whiteflies

Aphid Complex

I. Review of 2003/2004

II. Research and New Products

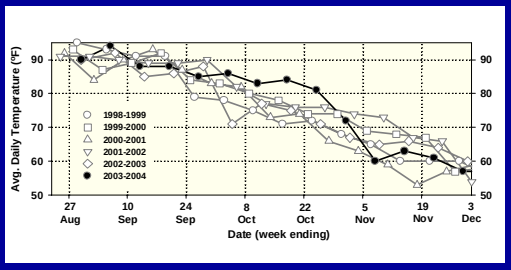
III. Recommendations

Worm Complex

Thrips

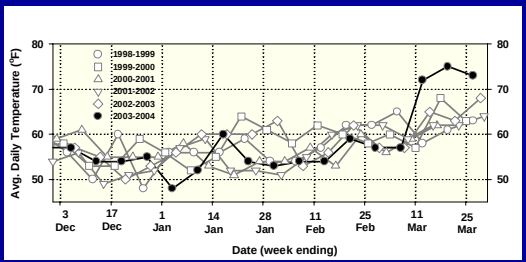
Fall / Winter Temperatures

Yuma Valley - AZMET



Winter / Spring Temperatures

Yuma Valley - AZMET



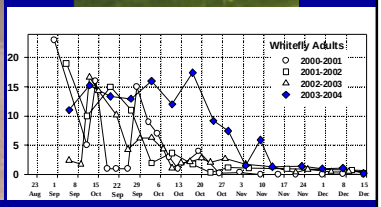
Seasonal Rainfall

Yuma Valley - AZMET

Avg Seasonal Rainfall (in.)

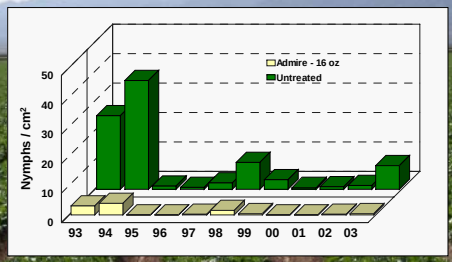
Yr	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Avg.
98-99	1.01	0	0.26	0.05	0	0.53	0	1.85
99-00	0.80	0	0	0	0	0.05	0.21	1.06
00-01	0.02	0.63	0	0	0.31	0.02	2.54	**3.52**
01-02	0	0.10	0.01	0.01	0	0	0	0.12
02-03	0.02	0	0.02	0	0	0.57	0.64	1.25
03-04	0.05	0	0.40	0	0.10	0.20	0.10	0.85
Avg.	**1.9**	0.73	0.69	0.06	0.41	1.37	**3.49**	

Silverleaf Whitefly

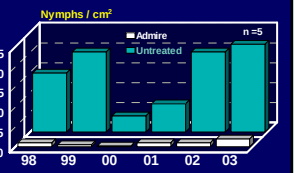


Field Performance of Admire in Commercial Lettuce

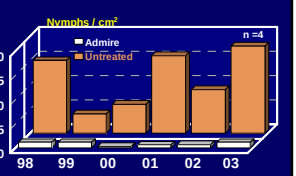
Yuma, Gila, & Dome Valleys



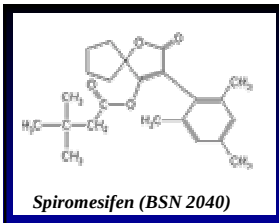
Fall Broccoli



Fall Cantaloupes

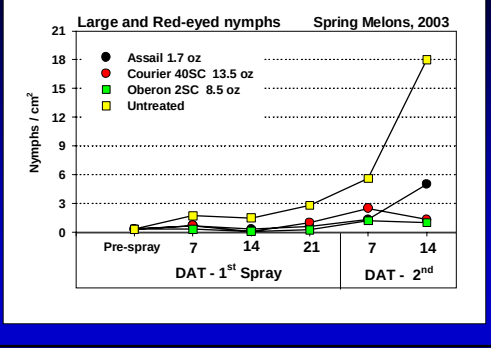


Oberon®



Spiromesifen (BSN 2040)

- A new IGR like compound from *Bayer Crop Sciences.*
- Inhibits lipid biosynthesis.
- Foliar contact activity against whiteflies and mites.
- Highly effective on nymphs and pupal stage.
- Considered harmless to pollinators .
- Excellent IRM tool.



Management Options

Admire 16-20 oz

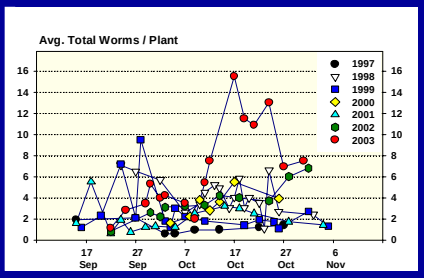
- 1.5 to 2 " below seed line
- 10-20 gpa

Pyrethroid combinations

- Capture, Danitol
- Orthene
- Endosulfan
- Provado

BAW and CL Populations in Untreated head Lettuce

Yuma Ag Center



BAW and CL Populations in Untreated head Lettuce

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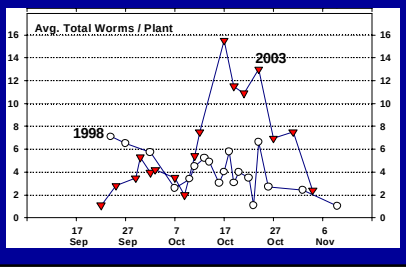
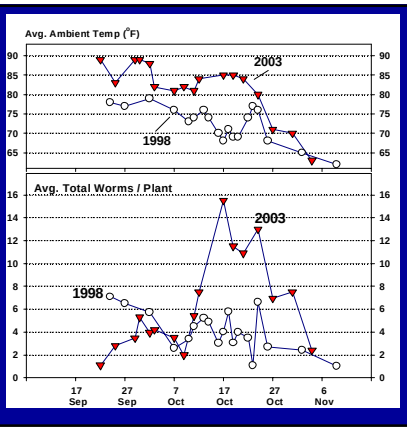
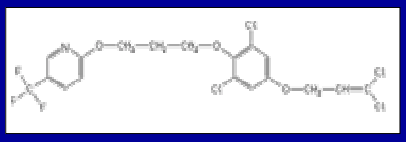




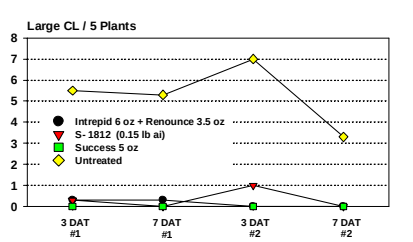
Pyridalyl (S-1812)



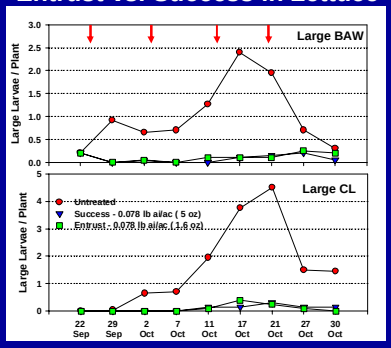
- A new chemistry, active on worms
- Unknown Mode of Action
- Translaminar activity / contact and Ingestion
- Considered an OP replacement (EPA)

Pyridalyl (S-1812)

Fall 2003 – Head Lettuce

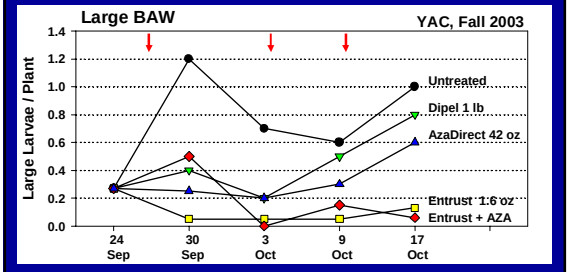


Entrust vs. Success in Lettuce



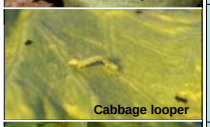
Interaction between Entrust and Aza-Direct

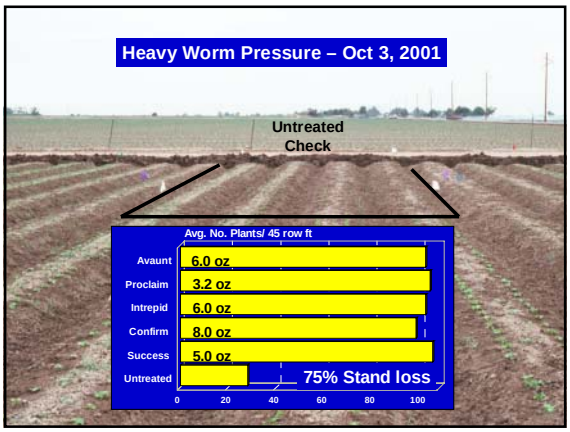
Trial 1



- Effective, Residual control
- Environmentally soft
- Short REI and PHI
- Selective Activity
- Unique modes of action

Lep-Specific Activity

	Intrepid	*Avaunt*	Proclaim	Success
 Beet armyworm	★★★	★★	★★★	★★★
 Cabbage looper	★★	★★★	★★	★★★
 Tobacco budworm	★★	★★	★★★	★★★



Factors Influencing Worm Control

- Spray applications
  - ~ Coverage / Deposition
  - ~ Adjuvants (+ or -)
  - ~ Rates
- Weather conditions
  - ~ wind
  - ~ rain
  - ~ dew
  - ~ temp/sunlight
- Plant growth parameters
- Insect pressure

Worm Management In Desert Head Lettuce-2003

	Stand Establishment		Post-thinning to Pre-heading			Heading to Harvest		
	Coty	*2-4 lf*	*4-8 lf*	*9-14 lf*	*Pre-heading*	*Early Head*	*Head 2-4"*	*Head >4"*
Success	■	■	■	■	■	■	▩	▩
Proclaim	■	■	■	■	■	■	▩	▩
Avaunt			■	■	▩	▩		
Intrepid			■	■	▩	▩		
Lannate	▩	▩	▩	▩	▩	▩	▩	▩
Larvin			▩	▩	▩			
Orthene Endosulfan			▩	▩				

■ Stand-alone worm control
▩ Tank-mix application

Desert Aphid Complex

Green peach aphid
Myzus persicae

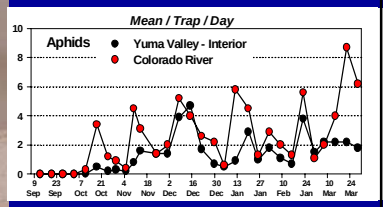
Potato aphid
Macrosiphum euphorbidae

Acyrthosiphon lactucae

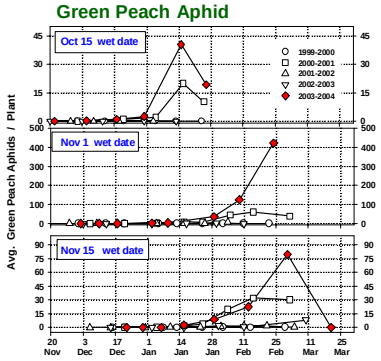
Foxglove Aphid
Aulacorthum solani

Lettuce aphid
Nasonovia ribis-nigri

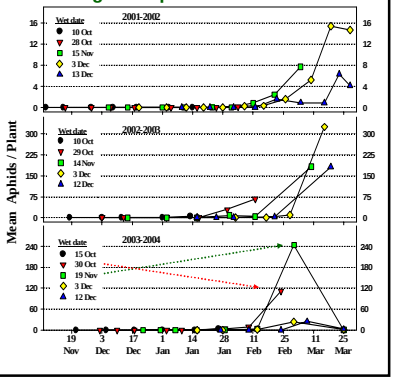
Sticky trap monitoring



Green Peach Aphid



Foxglove Aphid



Seasonal Avg. Green Peach Aphids / Plant

	Wet date					
Season	11 Oct	2 Nov	15 Nov	3 Dec	15 Dec	5 Yr Avg
1999-2000	0.0	0.1	0.1	0.3	0.2	0.1
2000-2001	5.5	20.4	12.6	4.7	5.7	9.8
2001-2002	0.0	1.0	0.7	0.2	0.1	0.4
2002-2003	0.0	0.8	1.8	0.0	0.3	0.6
2003-2004	15.8	117.0	23.0	10.6	12.0	**35.7**
Season Avg	4.3	**27.9**	7.6	3.2	3.7	

Seasonal Avg. Potato Aphids* / Plant

	Wet date					
Season	11 Oct	2 Nov	15 Nov	3 Dec	15 Dec	5 Yr Avg
1999-2000	0.0	0.1	2.5	3.5	1.0	1.8
2000-2001	1.3	6.7	4.6	1.6	2.7	3.4
2001-2002	0.2	0.4	1.5	0.8	5.6	1.7
2002-2003	2.3	1.4	75.2	94.2	60.1	**46.0**
2003-2004	0.0	0.1	0.0	0.0	0.0	0.0
Season Avg	0.8	2.2	16.2	**20.0**	13.9	

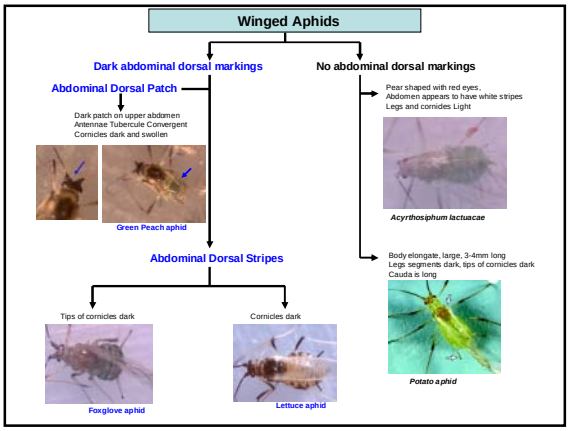
*** includes *Acrythosiphum lactucae* populations**

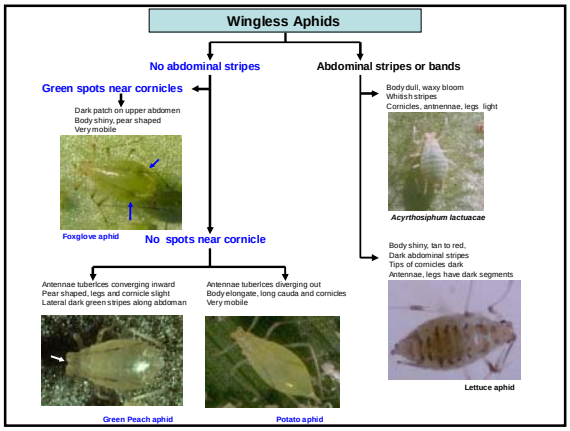
Seasonal Avg. Foxglove Aphids* / Plant

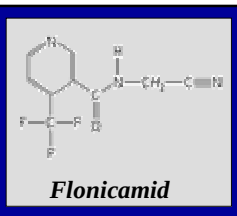
Season	Wet date					5 Yr Avg
	11 Oct	2 Nov	15 Nov	3 Dec	15 Dec	
1999-2000	-	-	-	-	-	-
2000-2001	-	-	-	-	-	-
2001-2002	0.0	0.1	1.2	14.6	1.5	3.5
2002-2003	1.1	16.3	32.6	67.1	37.2	**30.9**
2003-2004	1.4	25.1	49.8	5.6	5.7	17.5
Season Avg	0.8	13.8	**27.9**	**29.1**	14.8	

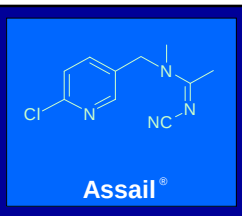
Seasonal Avg. for *Total Aphid Complex*

Season	Wet date					5 Yr Avg
	11 Oct	2 Nov	15 Nov	3 Dec	15 Dec	
1999-2000	0.0	0.1	1.4	1.7	1.9	1.0
2000-2001	2.3	9.4	6.1	3.1	5.8	5.3
2001-2002	0.1	0.4	1.1	4.1	2.9	1.7
2002-2003	0.9	4.7	27.9	48.5	34.5	**23.3**
2003-2004	4.3	35.6	18.3	4.3	5.6	13.6
Season Avg	1.5	**10.0**	**11.0**	**12.3**	**10.1**	









Pyridinecarboxamide

OP Replacement

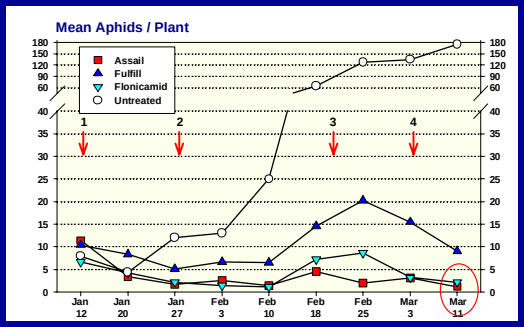
Active primarily on Aphids

Neonicotinoid

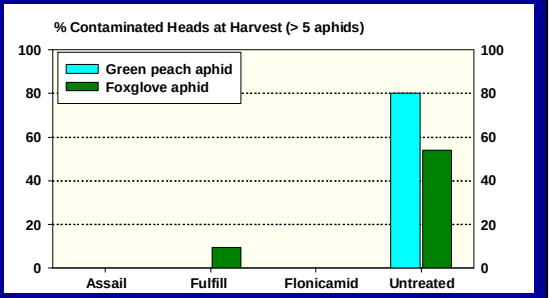
Reduced-risk

Aphid and Whitefly activity

Aphid Control with New Insecticides, Spring 2004



Aphid Control with New Insecticides, Spring 2004



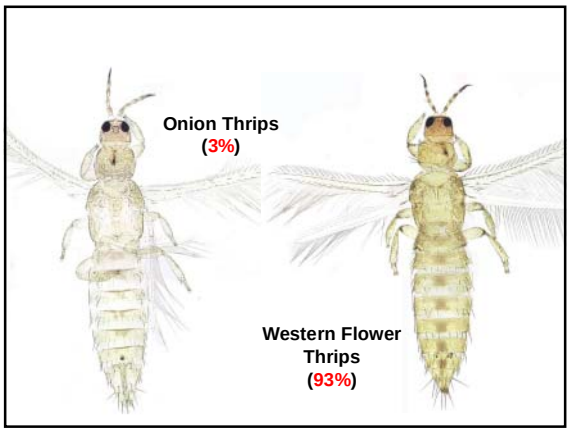
Effective Insecticides for Aphid Management

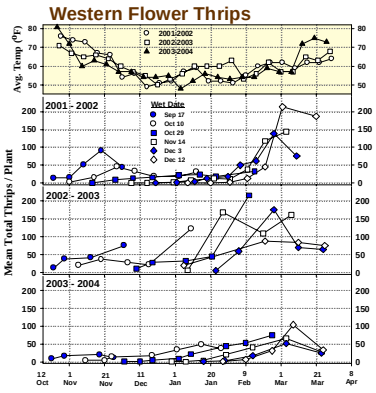
Admire	Season-long *
Provado	7 day residual
Endosulfan	7-10 d
Dimethoate	7-10 d
Orthene	Head lettuce; 21 d PHI
MSR	Head lettuce; 28 d PHI
Fulfill	7-14 d
Assail (CA)	14 d

* Higher rates in late Nov-Dec plantings for foxglove aphid

Keys to Economic Aphid Management

- Early detection of colonization
- Proper ID of species
- Treat when populations begin to colonize plants (1- 5% infestation)
- Use Insecticides at effective rates





Seasonal Avg. Thrips / Plant

Season	Wet date: 17 Sep	10 Oct	30 Oct	15 Nov	2 Dec	15 Dec	5 Yr Avg
2001-2002	43.3	23.6	16.9	37.0	40.2	65.9	37.8
2002-2003	41.7	45.7	66.2	111.8	75.9	66.8	**68.0**
2003-2004	14.1	22.8	25.9	22.7	19.5	35.0	23.3
Season Avg	33.0	30.7	36.3	**57.2**	**45.2**	**56.0**	

Western Flower Thrips

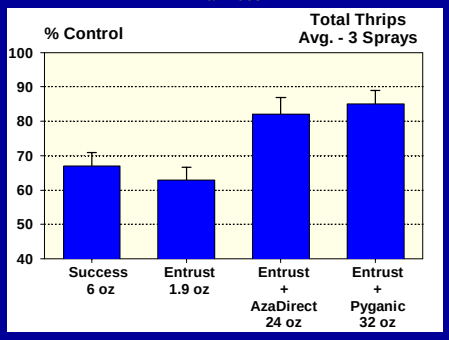
- No reliable sampling plan
- Lack of quantitative data on damage / quality
- Control is reliant on a few AI:
  - Lannate
  - Success
  - Orthene
- Insecticide resistance is a concern
- Lack of New alternatives
  ~ *Flonicamid / Assail*

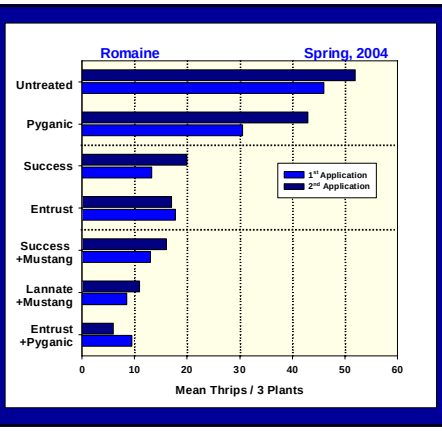
Western Flower Thrips in Organic Lettuce

Dow AgroSciences
Entrust®
Naturalyte® Insect Control
*Trademark of Dow AgroSciences LLC

Western Flower Thrips Control with Entrust

Fall 2003





Key to Economic Thrips Management

- Early detection of thrips populations
  "A few probably means a lot"
- Treat before thrips larvae become established
- Use Insecticides at effective rates
- By ground when possible

www.ag.arizona.edu/crops