



Insect Losses and Insecticide Use In Arizona Vegetables

J. Palumbo, A. Fournier, P. Ellsworth, P. Clay, and K. Nolte



Crop Insect Losses Working Group

- Goal: To provide information on insecticide-use patterns, insect-related losses and management costs in Arizona vegetable crops.
- Information traditionally provided using “expert” opinion.
- Improve the process with real world data.
- Primarily incorporates data from PCAs, Growers, and Agrichemical Industry.

Why is this Information Important?

Regulatory

- Section 18 Emergency Exemptions / 24C SLN
- Defense and Support of older A.I.s (*ie. Lannate*)
- FQPA: next go-around – endosulfan / pyrethroids

Academic

- Documents the role of new insecticides
- Quantitative measure of impact of IPM
- Historic record of insect losses / outbreaks
- Identifies and prioritizes pest problems

Why is this Information Important?

Industry

- Translates the PCAs job into *economic* terms
- Validates the *necessity* of PCA to the vegetable industry
- Emphasizes the *significance* of insect pests and their management in desert vegetable production
- Demonstrates *value* of new pest control technologies

Crop Insect Losses Workshops



Data collection (CIL workshops)

Crops and Locations:

- Spring Cantaloupes (Central AZ and Yuma)
- Spring Watermelons (Central AZ and Yuma)
- Fall and Spring Head Lettuce (Yuma)

Three Part Survey :

Part 1 General Estimates

- Overall yield reductions
- Management costs

Part 2 Crop losses

- Economic losses
- Yield losses

Part 3 Insecticide Use

- Treated acreage
- Spray frequency

Overall Crop Losses (%)

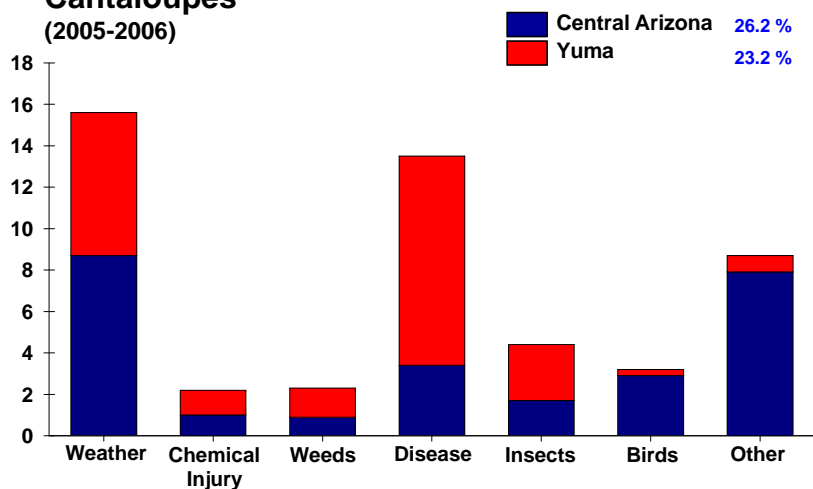
Spring Melons



Overall Crop Losses (%)

Cantaloupes

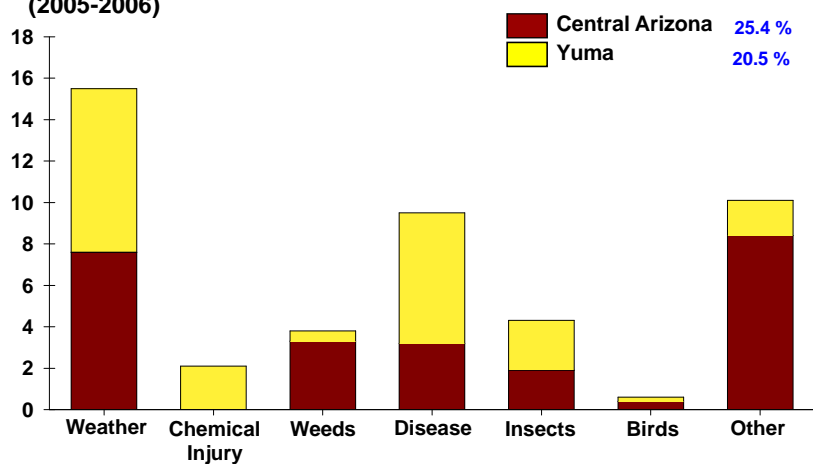
(2005-2006)



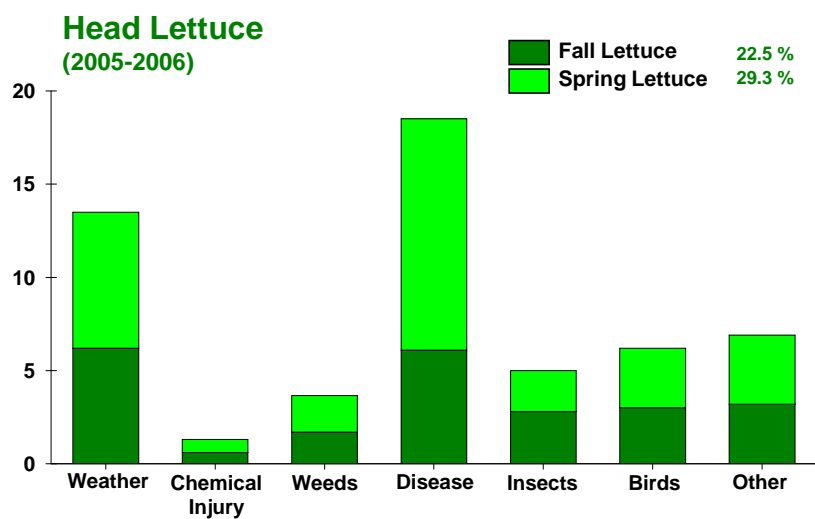
Overall Crop Losses (%)

Watermelons

(2005-2006)



Total Crop Losses (%)



Insect Management Costs

Cost (\$) of IPM



Insect Management Costs

Cost (\$) of IPM

IPM	Melons		Head Lettuce
	Central AZ	Yuma	
Acreage scouted (%)	100	100	100
No. field visits / week	2.2	3.4	3.8
Cost (\$) / acre	\$12.70	\$17.50	\$22.75
	\$5.75	\$5.15	\$6.00

Economic Losses (\$)

Control costs (\$)
Application frequency (No.)
Acres treated (%)



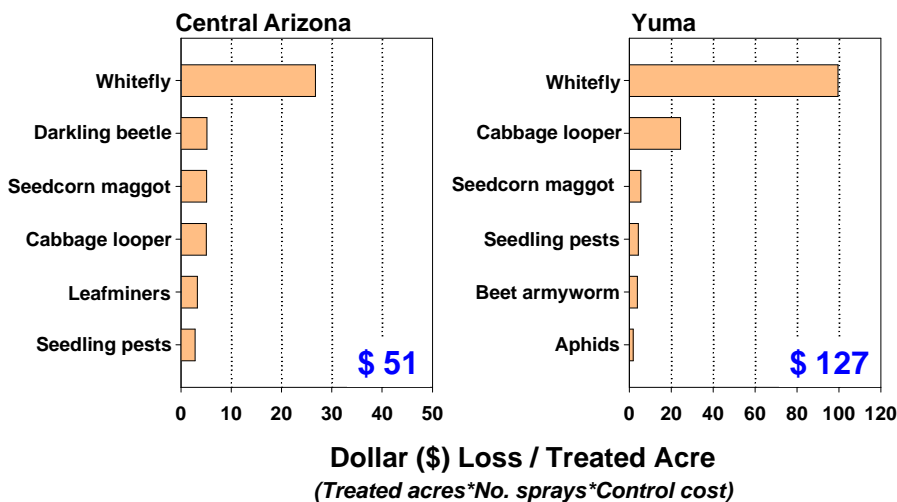




Economic Losses (\$)

Cantaloupes

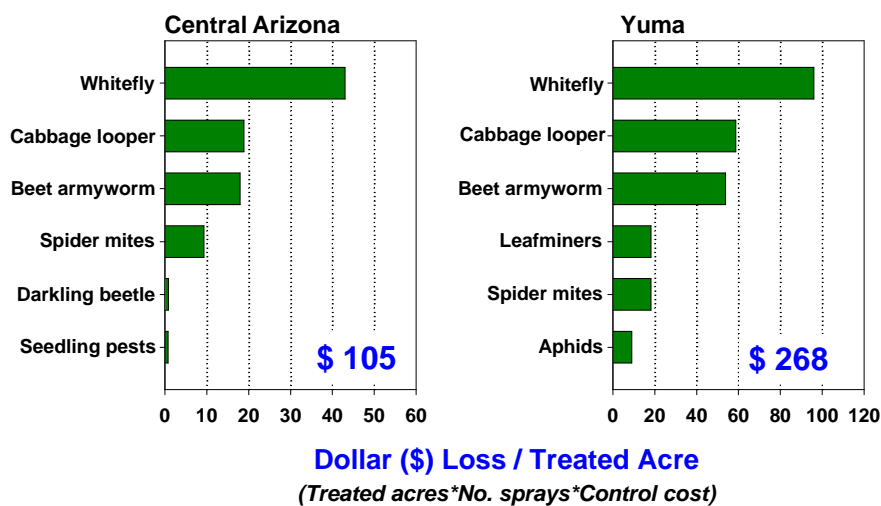
* Does not include
Application Costs (\$)



Economic Losses (\$)

Watermelons

* Does not include
Application Costs (\$)

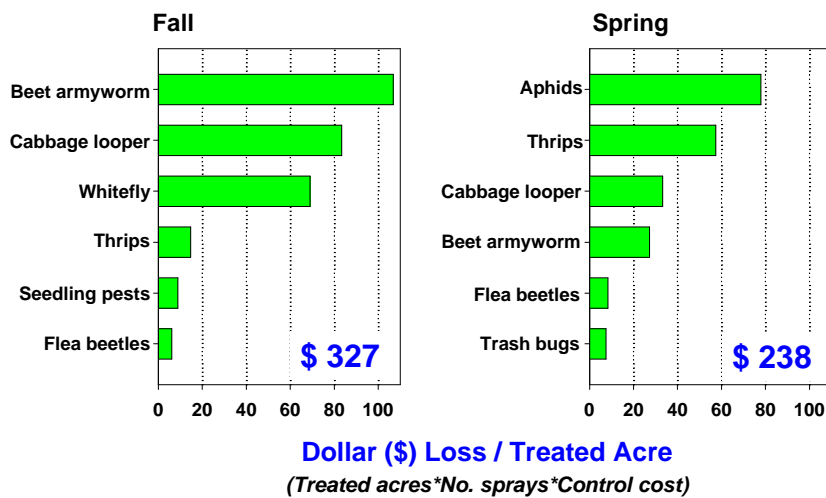


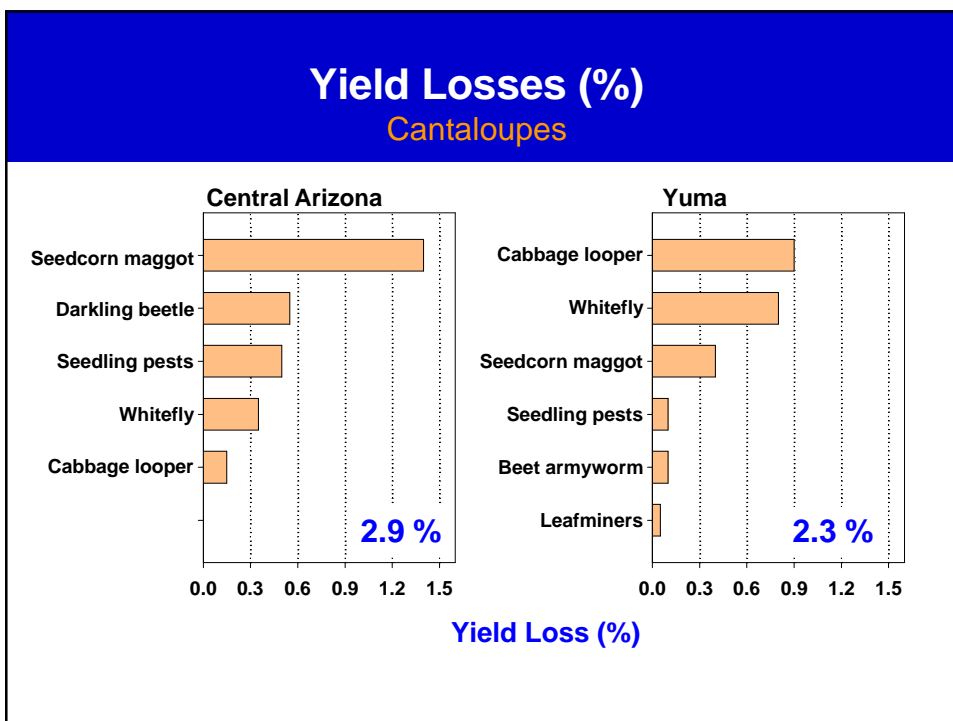


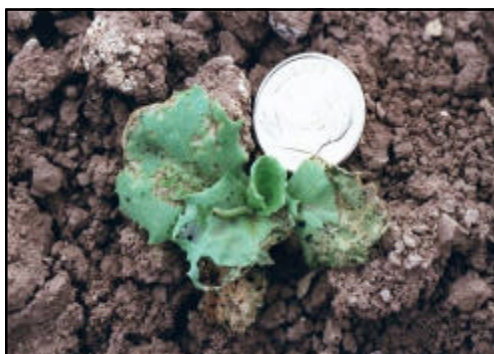
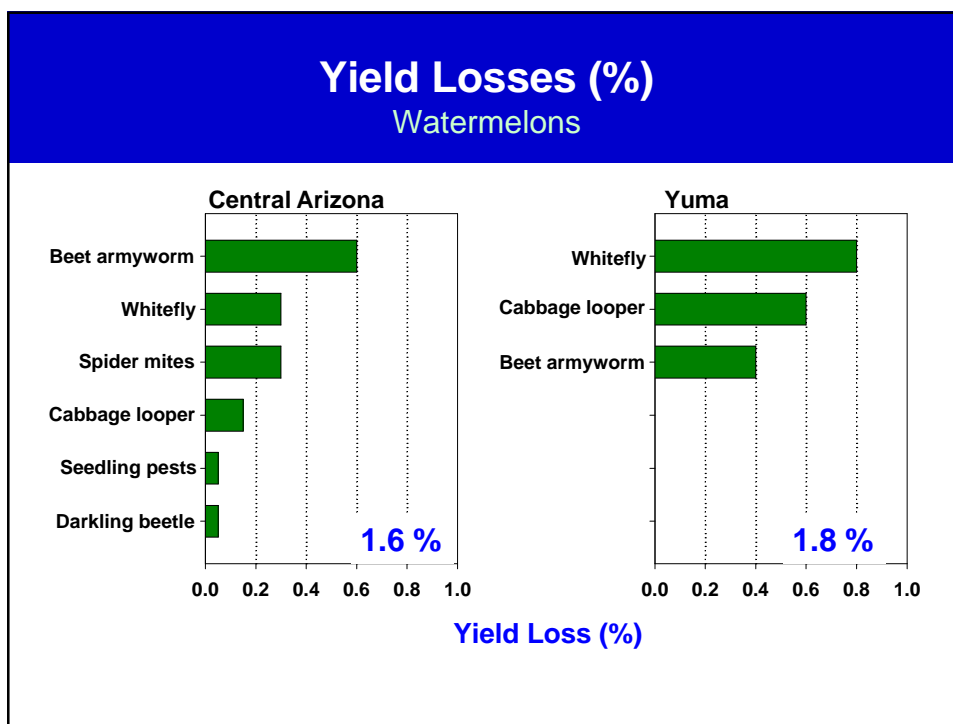


Economic Losses (\$)

Head Lettuce







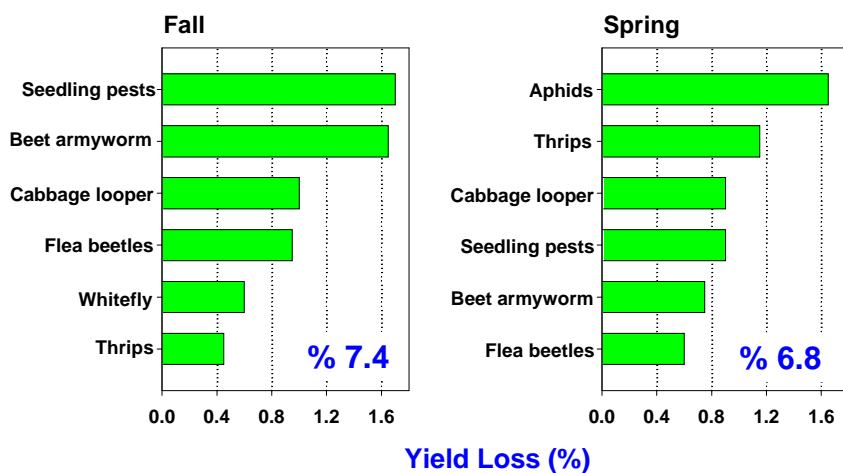
Yield Losses (%)

- Stand loss
- Reduced head size
- Uniformity
- Cosmetic quality
- Insect contamination



Yield Losses (%)

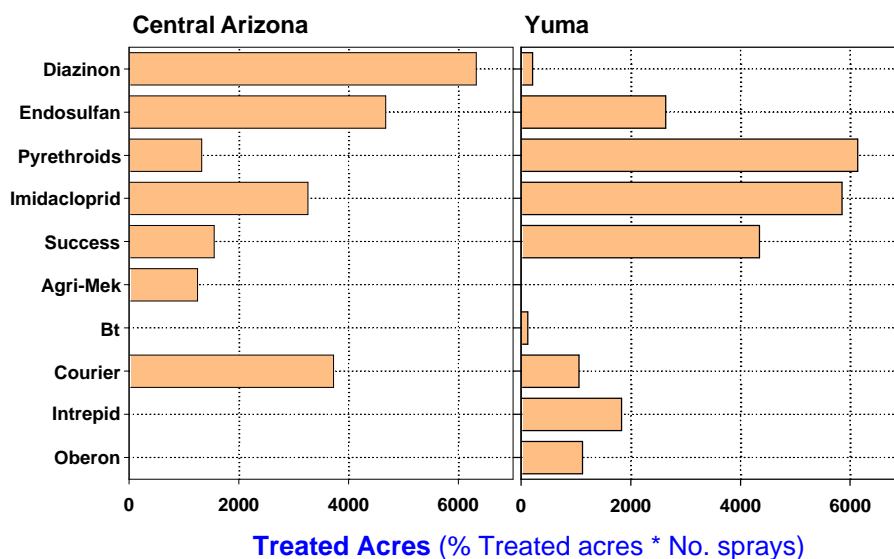
Head Lettuce



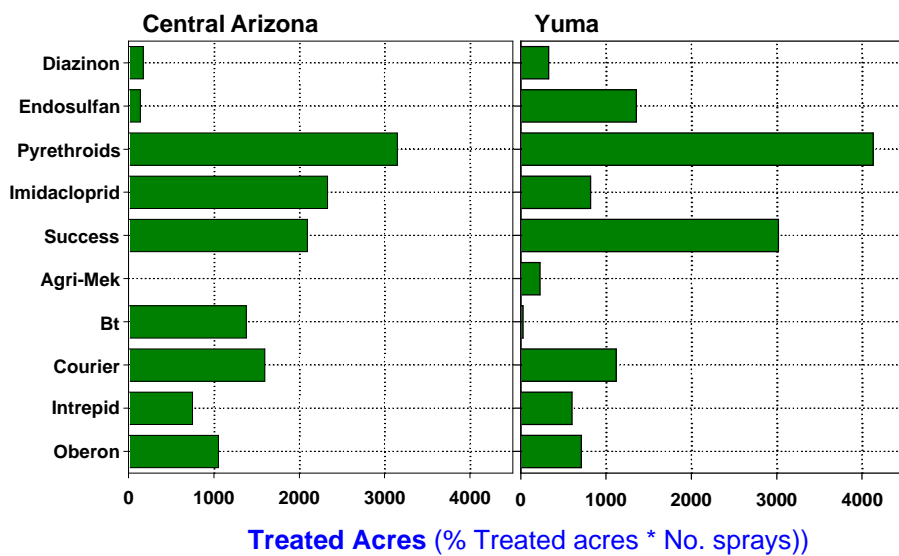
Insecticide Use

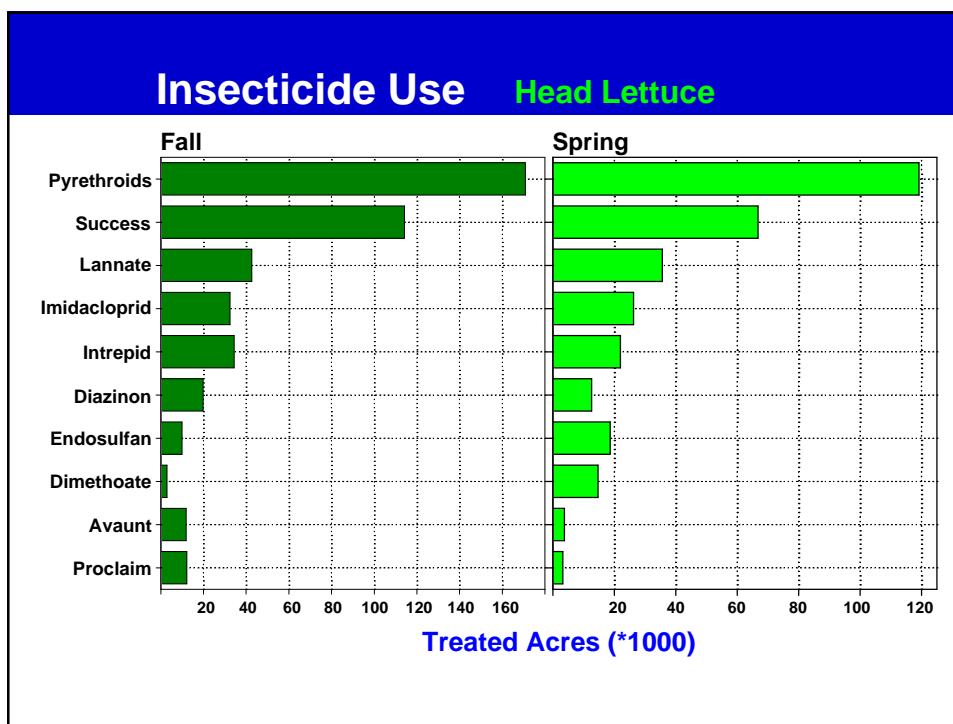


Insecticide Use Cantaloupes




Insecticide Use Watermelons





2006 VEGETABLE REPORT

College of Agriculture & Life Sciences, The University of Arizona



<http://cals.arizona.edu/pubs/crops/>

Relevant Outcomes

Regulatory

- ✓ FQPA (Lannate)
- ✓ Section 18 (Birds)

Academic

Industry

Lannate / Larvin Use in Head Lettuce

Feb 2007

Questions posed by USDA OPMP
for the Carbamate Cumulative Risk
assessment conducted by the EPA.

1. Typical use rates
2. Typical no. of applications
3. Timing of applications
4. Would both be applied to same crop in same growing season?
5. If so, how often ?



The concerns involve drinking water. Apparently thiodicarb breaks down into 2 molecules of methomyl and this is complicating the risk analysis as both products can be used on the same crops; head lettuce and sweet corn being of the most concern.

Pesticide Information Request Response
Arid Southwest IPM Network
March 7, 2007



Active Ingredients:

Methomyl (Lannate) and Thiodicarb

Crops/Target sites:

Sweet corn and **head lettuce**. EPA is also interested in other sections of the country where these crops are grown and these active ingredients are used.

Data Sources:

Arizona: The Pesticide Use Reporting (PUR) database provided data for product use from 2001 to 2005. In addition, data from an **annual head lettuce crop insect losses survey** conducted by John Palumbo were consulted. Dr. Palumbo provided responses for product use in head lettuce in Arizona. Eric Natwick collected information and provided responses for Imperial County, CA.

General Comments:

Lannate (methomyl) is extremely important to the AZ/CA Lettuce industries.



Relevant Outcomes

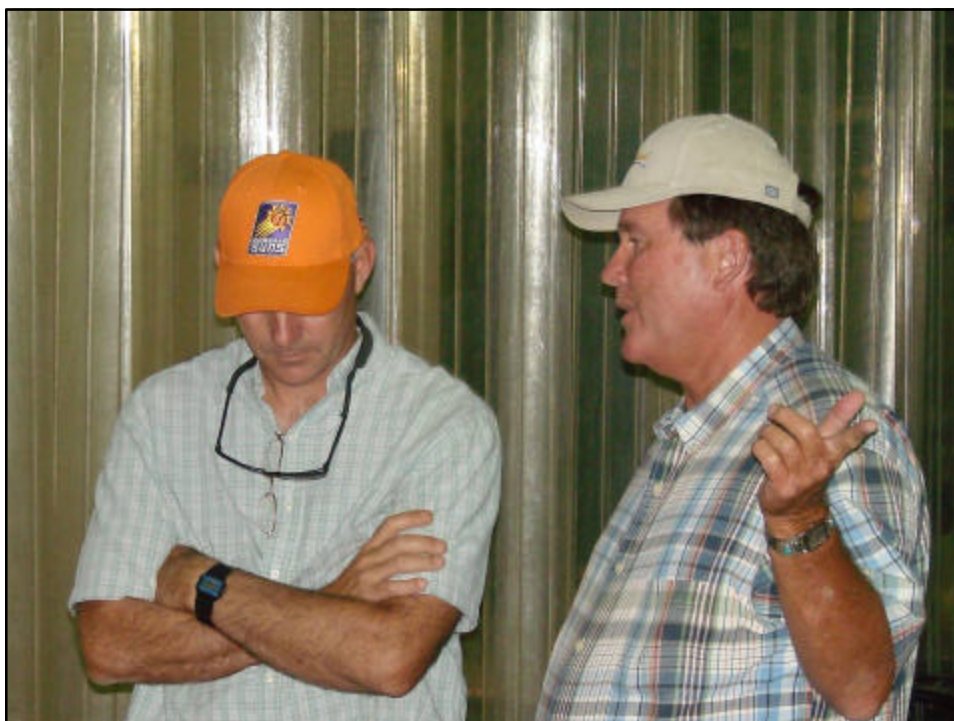
Regulatory

- ✓ FQPA (Lannate)
- ✓ Section 18 (Birds)

Academic

- ✓ Educating the educators
- ✓ Cost-effectiveness of IPM
- ✓ Relevancy of Insecticides
- ✓ Research Priorities

Industry







Relevant Outcomes

Regulatory

- ✓ FQPA (Lannate)
- ✓ Section 18 (Birds)

Academic

- ✓ Baseline Data for Education
- ✓ Relevancy of Insecticides
- ✓ Research Priorities

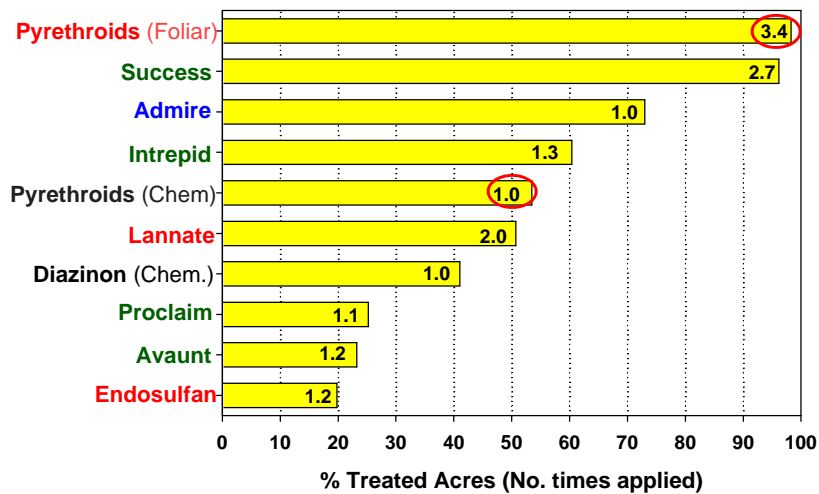
Industry

- ✓ Trends in Chemical Use **–Red Flags**
- ✓ Future Trends in Insect Management



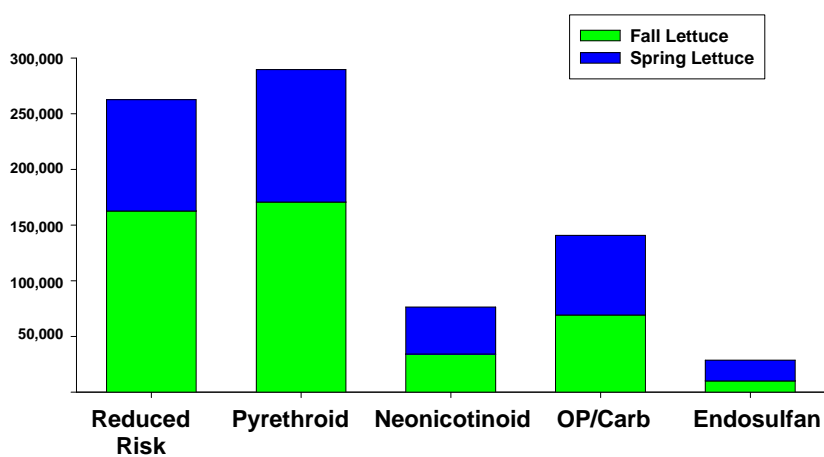
Insecticide Use

Fall Head Lettuce

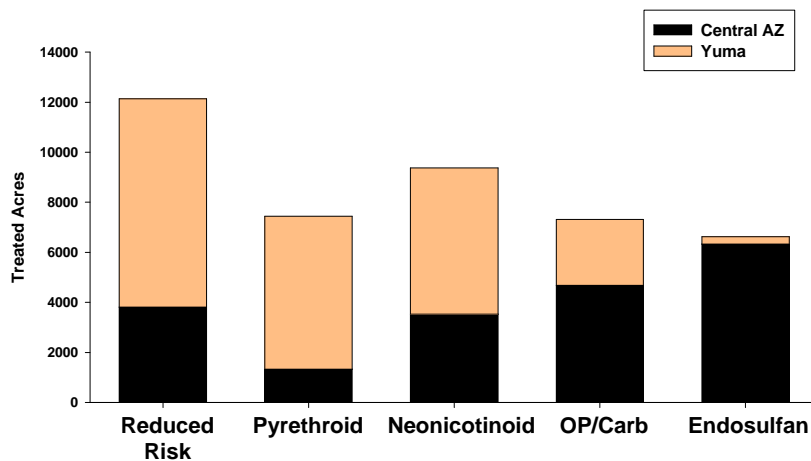




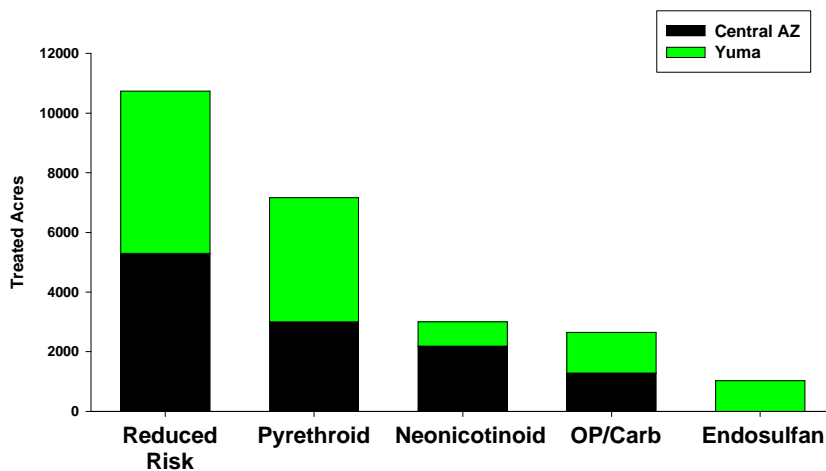
Insecticide Use By Chemical Class Head Lettuce



Insecticide Use By Chemical Class **Cantaloupes**



Insecticide Use By Chemical Class **Watermelons**





Trends in New Product and Chemistry Development in Desert Vegetable Crops

Provado Admire	* Knack * Courier * Confirm * Success	Proclaim Platinum * Fulfill * Avaunt * Assail * Intrepid	* Radiant * Alverde Tesoro * Movento * Coragen * Synapse * Venom * Oberon * Beleaf
1990–1995	1996–1999	2000–2004	2005–2008
Neonicotinoids	Pyridine-IGR Thiadiazine-IGR Diacylhydrazine-IGR Spinosyns	Pyridyl azomethine Oxadiazine	Ketoenols Pyridyl caboxomide Semicarbozone Pyridalyl Diamides

* Reduced Risk