



**Title:** **Head Lettuce Insect losses Workshop**  
**Sponsor:** **University of Arizona**  
**Date:** **April 4, 2007**  
**Location:** **Yuma Civic Center**

**California**  
3 hours

**Arizona**  
3 hours

## **Arizona Head Lettuce Insect Losses Workshop**

*Crop Insect Loss and Impact  
Assessment Working Group*

April 4, 2007



## 2005 Head Lettuce Insect Losses Working Group

- **Goal:** *To develop head lettuce insect losses, control costs, and related insect control information for the state of Arizona.*
- Data has traditionally been provided using incomplete surveys and “expert” opinion.
- Your opportunity to ground the process with “real world” data.

## Why is this Process Important?

In combination with the Pesticide Use Database  
(derived from 1080 data):

- Section 18 Emergency Exemptions
- Defense and Support of older A.I.s
- FQPA: next go-around – endosulfan/pyrethroids
- Quantitative database for measuring IPM
- Supports funding for UA Res / Extn programs
- Help to re-direct efforts of University

## Why is this Process Important?

- **Translates your job into economic terms for your customers**
- **Confirms the *importance* of the PCA to the lettuce industry**
- **Demonstrates value of new pest control technologies**
- **Shows importance of insect pests and their management in desert lettuce production**

### Part 1.

#### Arizona Head Lettuce Insect Losses Survey - 2005/2006

**Part 1**

1. Please indicate: PCA  Grower \_\_\_\_\_ Industry \_\_\_\_\_ Other \_\_\_\_\_
2. Reporting Area (county or counties) : Yuma
3. Date submitted: (dd/mm/yy): 5/2/2006

	Fall Lettuce (Sep - Nov)	Spring Lettuce (Dec-Mar)
4. Head Lettuce Acreage to which this estimate applies (total acres):		
5. Estimated yields in cartons (per acre) for this acreage.		
6. Potential yield in cartons (per acre) for this acreage. Assume ideal conditions		
7. Percent reduction in yield by: <b>Weather</b> (% reduction)		
8. Percent reduction in yield by: <b>Chemical injury</b> (% reduction)		
9. Percent reduction in yield by: <b>Weeds</b> (% reduction)		
10. Percent reduction in yield by: <b>Disease</b> (% reduction)		
11. Percent reduction in yield by: <b>Insects</b> (% reduction)		
12. Percent reduction in yield by: <b>Birds</b> (% reduction)		
13. Percent reduction in yield by <b>Other Factors</b> : List factors below. (% reduction)		

# Responses For Fall and Spring Head Lettuce :



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	Fall Lettuce (Sep - Nov)	Spring Lettuce (Dec-Mar)
4. Head Lettuce Acreage to which this estimate applies (total acres):	1500	1000
5. Estimated yields in cartons (per acre) for this acreage.	850	975
6. Potential yield in cartons (per acre) for this acreage. Assume ideal conditions	1050	1100
7. Percent reduction in yield by: <b>Weather</b> (% reduction)		
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# Percent (%) Reductions in Yield



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7. Percent reduction in yield by: <b>Weather</b> (% reduction)	5	6
8. Percent reduction in yield by: <b>Chemical injury</b> (% reduction)	1	1
9. Percent reduction in yield by: <b>Weeds</b> (% reduction)	2	2
10. Percent reduction in yield by: <b>Disease</b> (% reduction)	9	11
11. Percent reduction in yield by: <b>Insects</b> (% reduction)	5	4
12. Percent reduction in yield by: <b>Birds</b> (% reduction)	3	5
13. Percent reduction in yield by <b>Other Factors</b> : List factors below. (% reduction)		

# Percent (%) Reductions in Yield



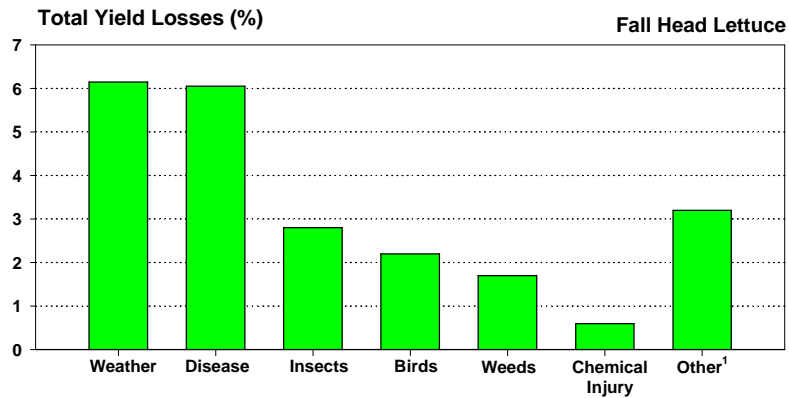
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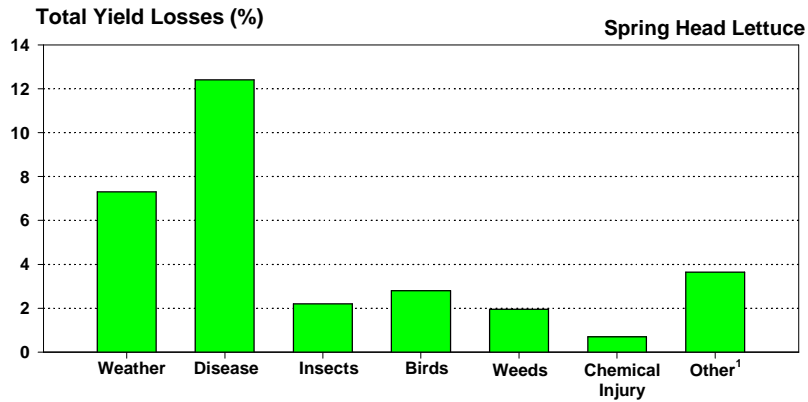
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**Vertebrates, rodents, salt, poor crop management,  
poor thinning and weeding, bad market**

## Yield Reductions due to Biological, Environmental and Management Factors in Fall Head Lettuce (2005 and 2006).



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## Insecticide Applications



<b>Application Costs:</b> It is possible that acreage could have been treated using both air and ground sprayer, thus, when combined, percentages may total > 100%. These estimates are for <b>Insecticide Applications</b> .	<b>Fall Lettuce</b> <i>(Sep - Nov)</i>	<b>Spring Lettuce</b> <i>(Dec-Mar)</i>
14. Percent acres (for this estimate) treated by <b>air</b> in 2004/2005:	<b>100</b>	<b>90</b>
15. Average number of insecticide treatments by <b>air</b> :	<b>3.5</b>	<b>3</b>
16. Cost (\$) per acre for a single aerial application:	<b>8.50</b>	<b>9.00</b>
17. Percent acres (for this estimate) treated by <b>ground</b> in 2004/2005:		
18. Average number of insecticide treatments by <b>ground</b> :		
19. Cost (\$) per acre for a single ground application:		

## Insecticide Applications



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16. Cost (\$) per acre for a single aerial application:	<b>8.50</b>	<b>9.00</b>
17. Percent acres (for this estimate) treated by <b>ground</b> in 2004/2005:	<b>100</b>	<b>90</b>
18. Average number of insecticide treatments by <b>ground</b> :	<b>4</b>	<b>4</b>
19. Cost (\$) per acre for a single ground application:	<b>14.50</b>	<b>15.00</b>

## Insect Management Fees



<b>Insect Management Fees:</b> Estimate the cost (\$) of insect management fees paid by growers to pest control advisors.	<b>Fall Lettuce</b> <i>(Sep - Nov)</i>	<b>Spring Lettuce</b> <i>(Dec-Mar)</i>
20. Percent of acres where insect monitoring, scouting and sampling was conducted:	<b>100</b>	<b>100</b>
21. Number of field visits per week:	<b>4</b>	<b>3</b>
22. Estimated cost (\$) per acre for insect monitoring/advisory:	<b>22.50</b>	<b>21.00</b>
<b>Comments:</b>		

## Part 1.

### Insecticide Applications

	Insecticide Applications	
	Aerial	Ground
Acres treated (%)	91%	92%
No. applications	3.2	2.3
Cost (\$) / application	\$8.84	\$14.46

## Part 1.

### Insect Management Fees

Insect Management	Fall	Spring
Acres scouted (%)	100%	100%
Field visits / week	3.8	2.9
Cost (\$) / acre	\$ 22.80	\$ 22.70

## Part 2. Insect Losses



Stand loss  
 Reduced head size  
 Uniformity  
 Cosmetic quality  
 Insect contamination



Application costs  
 Insecticide costs  
 Spray frequency  
 Acres treated

Part 2.

### Arizona Head Lettuce Insect Losses Survey - 2005/2006

Pest	A		B		C		D		E	
	% acres where pest was present		% acres treated for this pest		Number of insecticide applications required to control this pest		Cost \$ of one application per / acre (include application cost)		% reduction in yield due to this pest	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
23 Seedling Pests -ground beetles, earwigs, crickets										
24 Flea beetles										
25 Leafminers										
26 Salt marsh caterpillar										
27 Beet armyworm										
28 <b>Thrips</b>	<b>100</b>	<b>100</b>	<b>30</b>	<b>85</b>						
29 Budworm/bollworm										
30 Other Lep larvae										
31 Silverleaf whitefly										
32 Green peach aphid										
33 Foxglove aphid										
34 Lettuce aphid										
35 Other aphid species										
36 Thrips										
37 Trash bugs (Lygus, leaf-hoppers, False chinch bugs, etc.)										
38 Other insects (list below)										

Part 2.

Arizona Head Lettuce Insect Losses Survey - 2005/2006

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Part 2.

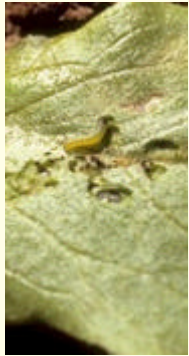
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			B		D	
			% acres treated		Cost \$ of one application per acre	
			Fall	Spring	Fall	Spring
39a	Chemigation treatments used at stand establishment during 2004/2005:	Once:	<b>90</b>	<b>25</b>	<b>12.50</b>	<b>12.50</b>
39b		2 or more				
40	Soil-applied insecticide used (Admire pre-emergence):		<b>100</b>	<b>75</b>	<b>70</b>	<b>70</b>

**Major pests in 2005 and 2006 Treated Acres and No. of Sprays**

**Fall  
Head Lettuce**



**Beet armyworm**  
95% acres  
3.6 sprays



**Cabbage looper**  
96% acres  
3.0 sprays

**Spring  
Head Lettuce**



**Thrips**  
82% acres  
2.4 sprays



**Green peach aphid**  
59% acres  
2.1 sprays

**Major pests in 2005 and 2006**

**% Reduction in Yield**

**Fall  
Head Lettuce**



**Seedling pests**  
1.7 % loss



**Beet armyworm**  
1.7 % loss

**Spring  
Head Lettuce**



**Thrips**  
1.4 % loss



**Green peach aphid**  
1.1% loss

## Part 3. Insecticide Use Survey



### Arizona Head Lettuce Insect Losses Survey - 2006/2007

Part 3.

	Fall Lettuce (September -November)		Spring Lettuce (December-March)	
	Acres (%) treated with this product	Avg no.of times treated with product	Acres (%) treated with this product	Avg no.of times treated with product
Orthene (acephate)	10	1	25	1.5
Dimethoate				
MSR				
Diazinon- Foliar				
Diazinon- Chemigation				
Malathion				
Lannate				
Larvin				
Endosulfan				
Pyrethroids - Foliar				
Pyrethroids - Chemigation				
Admire (imidacloprid)				
Generic imidacloprid (Alias, Couraze, Nuprid, Widow, etc.				

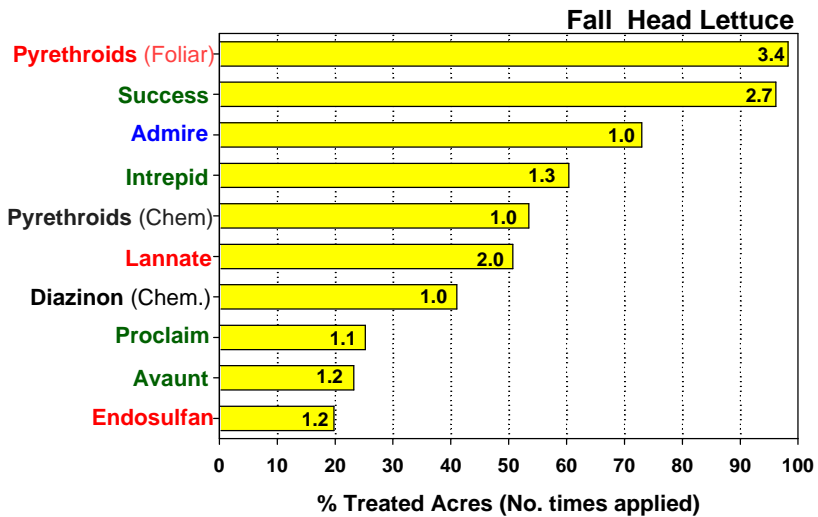
### Arizona Head Lettuce Insect Losses Survey - 2006/2007

Part 3.

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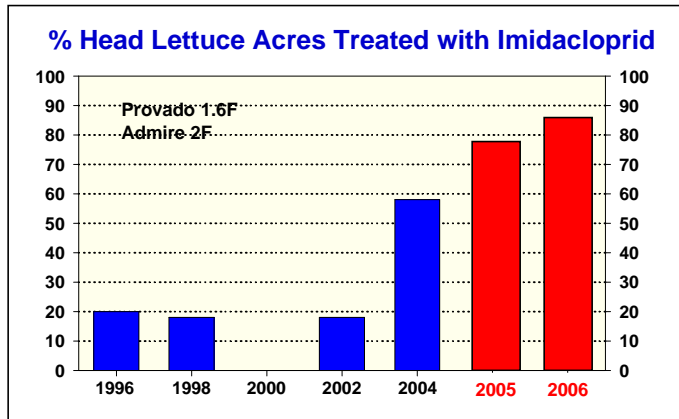
New additions: Venom, Beleaf, Generics

### Part 3. Insecticide Use - 2005 and 2006





# ARIZONA AGRICULTURAL STATISTICS SERVICE 2004 ANNUAL STATISTICS BULLETIN



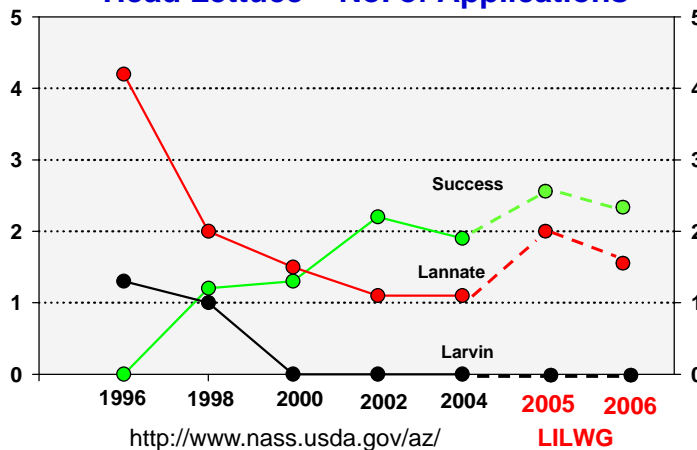
- This is data that is currently used for regulatory processes

<http://www.nass.usda.gov/az/>



# ARIZONA AGRICULTURAL STATISTICS SERVICE 2003 ANNUAL STATISTICS BULLETIN

### Head Lettuce – No. of Applications



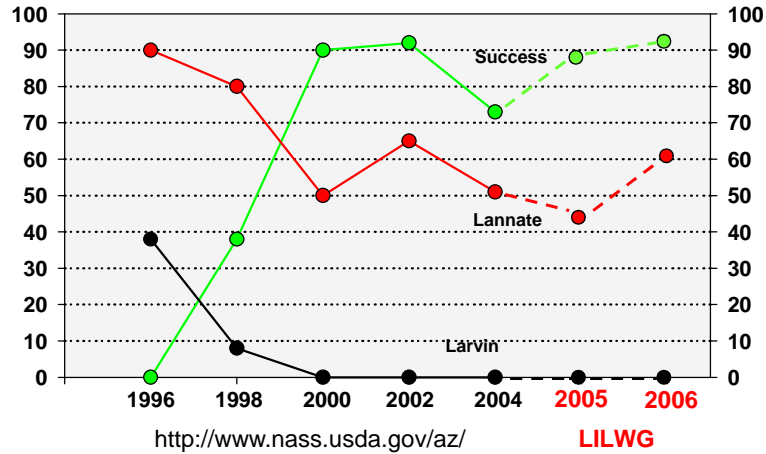
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LILWG



## ARIZONA AGRICULTURAL STATISTICS SERVICE 2003 ANNUAL STATISTICS BULLETIN

### % Head Lettuce Acres Treated



## Lannate / Larvin Use in Head Lettuce

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.

**2006 VEGETABLE REPORT**

College of Agriculture & Life Sciences, The University of Arizona



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

**Let's get started!**

