



# Risk Avoidance & Mitigation Program

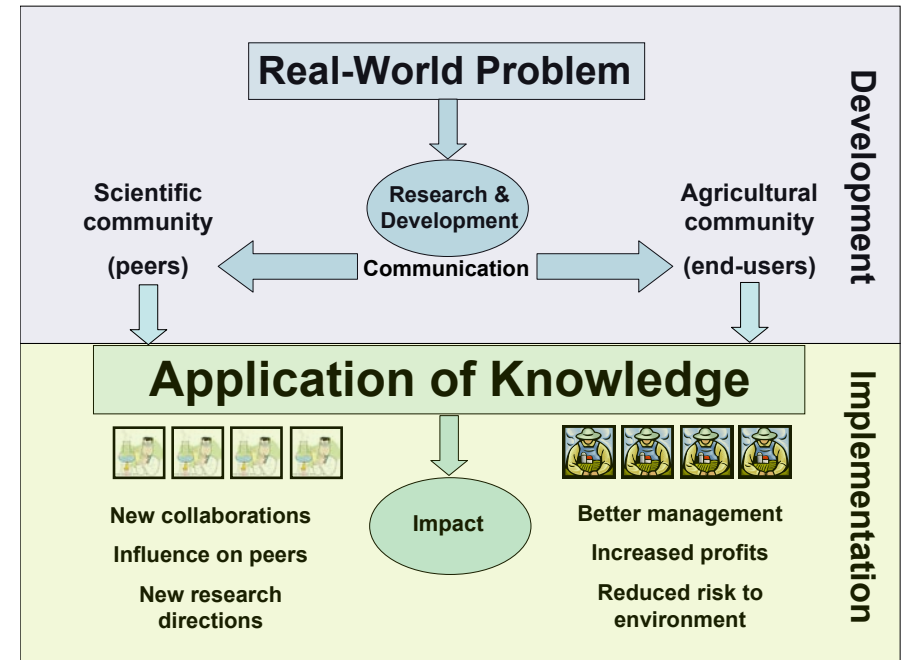
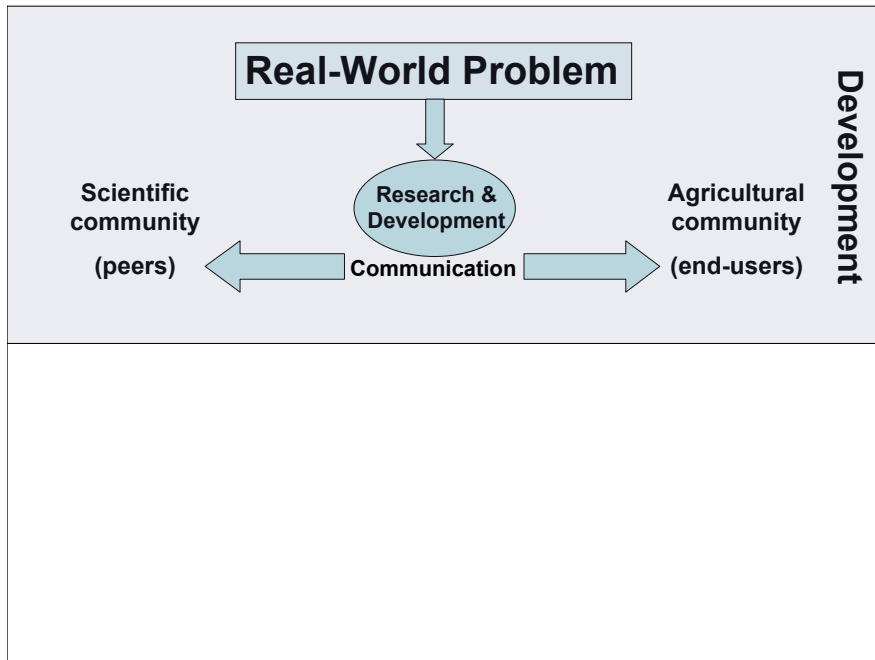
## RAMP Outreach, Evaluation & Impact Assessment

*“To enhance the development and implementation of innovative IPM strategies”*

Dr. Al Fournier  
IPM Program Manager  
University of Arizona  
Maricopa Agricultural Center



LYGUS RAMP PI MEETING - JUNE 22, 2009



## My RAMP Projects

- **Section IV: Outreach**
  1. Provide a clearinghouse for project information (website)
  2. Facilitate ongoing partner communication (listserv)
- **Section IV: Evaluation**
  1. Measure outputs & delivery to end-users
  2. Measure adoption & impact of our work

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## What we measure

Activities	<b>What we do</b> - Research - Outreach
Results	<b>What we learn</b> - New knowledge - New applications
Products	<b>How we share what we learn</b> - Research outputs - Outreach outputs
Outcomes & Impacts	<b>What we change (or influence)</b> - In individuals (short-term) - In communities (medium) - In the world (long-term)

## Reporting Responsibilities

What	Who	How
<b>Activities</b>	Researcher	Reporting Matrix
<b>Results</b>	Researcher	Reporting Matrix
<b>Products</b>	Researcher	Reporting Matrix
<b>Impacts</b>	Eval Team Researcher	Surveys & Data

# What is an “Impact Nugget”!?!

- AKA, success story
- Links your activity, product or recommendation to someone else’s action or behavior
- Tells a story of your influence
- Can be anecdotal



# A good Impact Nugget

“On a college farm setting, alfalfa was completely cut in June causing massive Lygus movement into cotton. The farm managers are now firm believers in leaving some alfalfa habitat to mitigate Lygus movement and utilized this approach for the remainder of the season.”

- Pete Goodell

## RAMP Tracking Matrix 2008

RAMP OUTCOME TRACKING MATRIX: Updated Nov 30, 2008.							
Investigators	Project Title	Objectives	Research Activities	Education Activities & Products	Measurements	Impact "nuggets" / Success stories	Leveraged Resources
<b>SECTION 1: Field Level Experimental: Yield/Damage/Thresholds</b>							
<b>Ellsworth (AZ cotton)</b>	Development of dynamic yield : density relationships for terminating chemical control in cotton	1. Analyze 4-yr of Lygus chemical termination data. 2. Establish rules and/or guidelines for decision-making with respect to Lygus control termination. 3. Establish grower-demonstrations to both test, verify, and validate decision rules. 4. Conti	1. All data have been assembled into a common database and prepped for analysis. A rate series of a novel chemical control agent was used to establish varying densities of Lygus and showed excellent relationship between Lygus levels (esp. nymphs) and yield	1. Presented invited talk at PB-ESA symposium in 4/08 on Lygus control termination & plant compensation for damage. 3a. One grower demonstration in 2007 was conducted with reduced-risk compound and timing of Lygus control termination. 3b. One grower field	Lygus thresholds, control termination, and plant compensation were presented to ca. 34 scientists; Met with 4 PCAs and 1 grower to discuss Lygus mgt and potential demonstrations. Reached over 200 growers/PCAs in grower mtgs & field day with information o	One grower managed 1200 A of cotton late season with a reduced-risk insecticide based in part on this research and the pilot guidelines. Two PCAs reported using nymphs exclusively for timing Lygus chemical controls overturning a long-standing practice of	4-yr of previous support from CI to help develop the experimental basis of this activity. MAC graduate student assistantship for 1 Ph.D. student doing related work showing whitefly pest resurgence in response to poor choices in Lygus chemical control (ca

**Thank You!**

## Reporting Changes 2009

- **Matrix: Report research & outreach activities, measurements and “impact nuggets”**
- **A new set of guidelines for reporting:**
  - Research results (less restrictive)
  - Products (citation format)
  - Leveraged resources (clarity)

## Outcomes & Impacts

Level	What we measure	Tool
Individuals	Changes in knowledge	LS
	Changes in skills	LS
	Changes in attitude	LS
	Changes in behavior (adoption)	LS
Communities & systems	Changes in patterns of behavior	LS, CPL, PUR, RFS
	Economic impact	CPL, PUR, RFS
	Environmental impact	CPL, PUR, RFS

LS = Lygus Survey  
 CPL = Crop Pest Losses Survey  
 PUR = Pesticide Use Reporting data  
 RFS = Random Field Survey

## Community & System Impact

- Pesticide Use Reporting data (CA, AZ)
- Random Field Survey (from Regional Ecology project: AZ, CA, TX)
- Crop Pest Losses & Impact Assessment Survey (AZ, eastern CA)

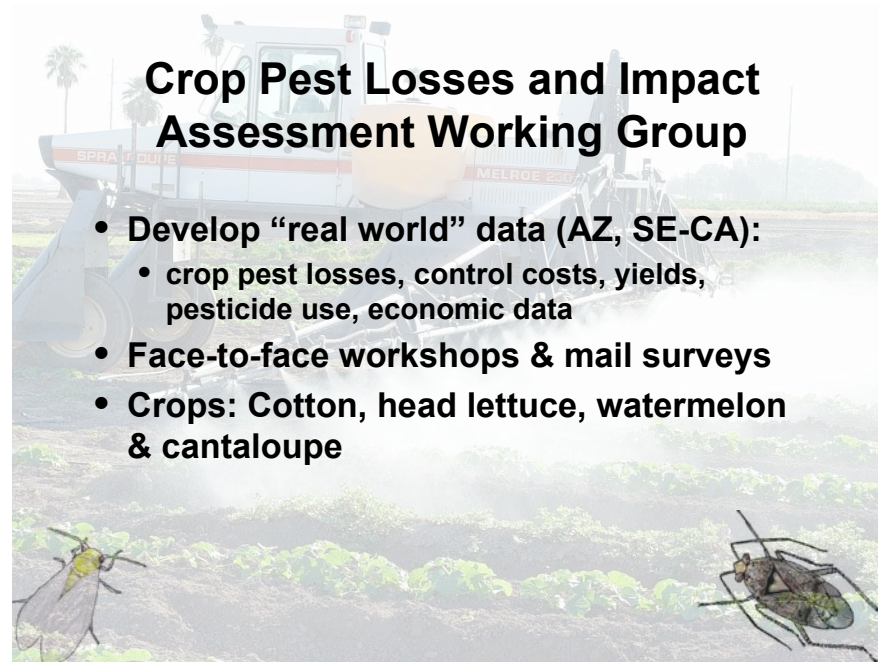
## Lygus Survey



- Eval Team: Fournier, Ellsworth, Goodell, Parajulee, Bundy, Godfrey, Kerns
- Developed Lygus Survey & ran it at Extension meetings 2008-09
- 144 responses (67 AZ, 37 TX, 28 CA, 12 NM), data entry underway
- Goal: pre & post measures of lygus management K, S, A & resource use

## Crop Pest Losses and Impact Assessment Working Group

- Develop “real world” data (AZ, SE-CA):
  - crop pest losses, control costs, yields, pesticide use, economic data
- Face-to-face workshops & mail surveys
- Crops: Cotton, head lettuce, watermelon & cantaloupe



# The Questionnaire

**Arizona Spring Melon Insect Losses Survey - 2005**

1. Please indicate: PCA \_\_\_\_\_ other \_\_\_\_\_

2. Reporting Area (county or counties) : \_\_\_\_\_

3. Date submitted: (dd/mm/yy): \_\_\_\_\_

	Cantaloupes, Honeydew, and others	Watermelons
4. Melon Acreage to which this estimate applies: AZ _____ CA _____		
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>All insects combines</b> (% reduction)		
12. Percent reduction in yield by <b>Other Factors</b> : List factors below. (% reduction)		
<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> .		
13. Percent acres (for this estimate) treated by <b>air</b> in 2004/2005:		
14. Average number of insecticide treatments by <b>air</b> :		
15. Cost (\$) per acre for a single aerial application:		
16. Percent acres (for this estimate) treated by <b>ground</b> in 2004/2005:		
17. Average number of insecticide treatments by <b>ground</b> :		

# Insect Losses

Part 2. Arizona Spring Melons Insect Losses Survey - 2006

Pest	A % acres where pest was present		B % acres treated for this pest		C Number of Foliar insecticide sprays used to control this pest		D Cost \$ of a single spray application per / acre (Include application cost)		E % reduction in yield due to this pest	
	Cantaloupe	Watermelon	Cantaloupe	Watermelon	Cantaloupe	Watermelon	Cantaloupe	Watermelon	Cantaloupe	Watermelon
23 Seedling Pests -ground beetles, earwigs, crickets										
24 Seedcorn Maggot										
25 Flea beetles										
26 Leafminers										
27 Beet armyworm										
28 Cabbage looper	99.3%	100%	80.2%	100%	1	2	\$ 29.50	\$ 31.50	2%	1%
29 Whiteflys										
30 Aphids										
31 Thrips										
32 Spider Mites										
33 Trash bugs (Lygus, False chinch bugs, etc.)										
34 Darkling Beetles										
35 Other Insects (list below)										

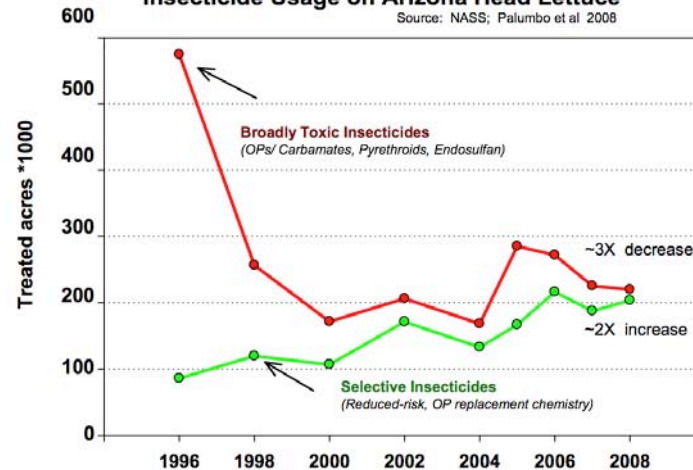
# Insecticide Survey

Never	Rarely (not every year)	Often (every year)	"Go to" Product	Primary Target Pest(s)	<input type="radio"/> Industry <input checked="" type="radio"/> PCA <input type="radio"/> Grower	County: <u>Pinal</u>
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		Acres (%) treated with this product	Avg. no. of times treated with product
				<b>cutworms</b>	<b>2%</b>	<b>1</b>

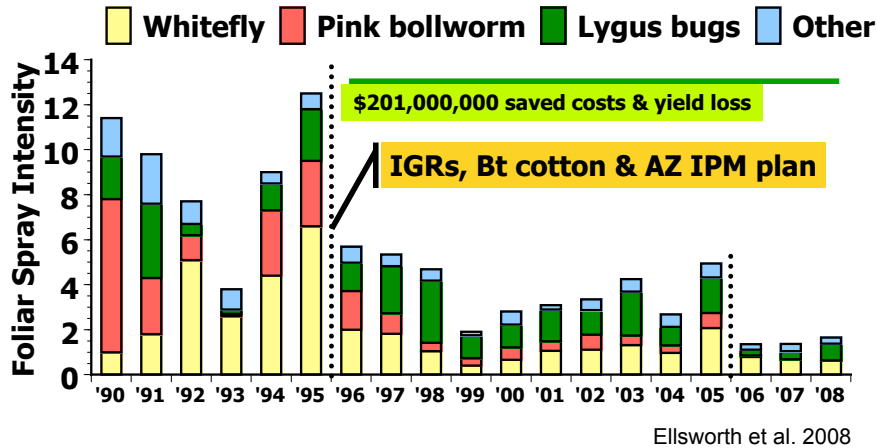


**Insecticide Usage on Arizona Head Lettuce**

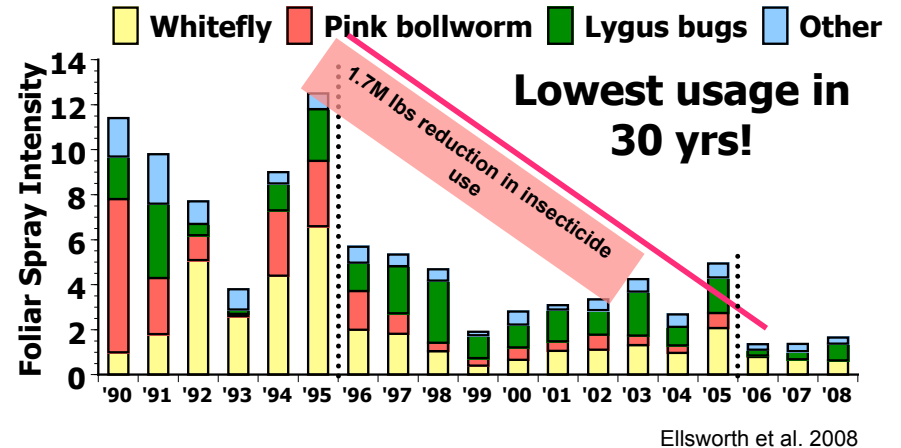
Source: NASS; Palumbo et al 2008



# Cotton IPM Saves Millions \$

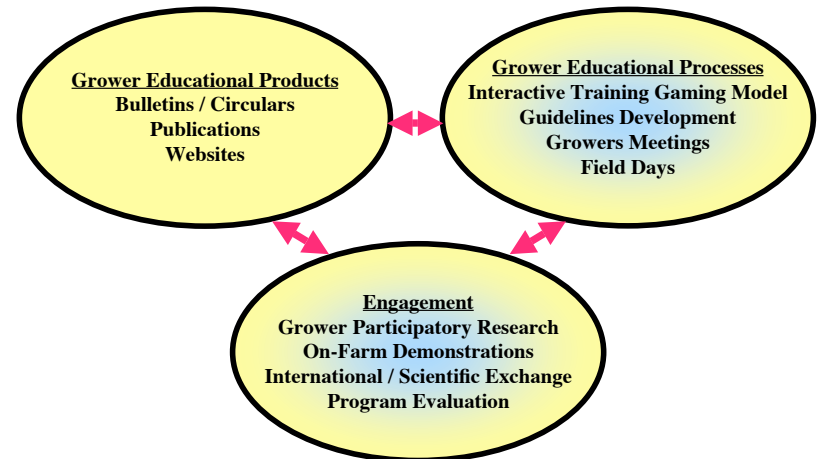


# Health & Environment



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## Outreach



# RAMP Website

<http://cals.arizona.edu/apmc/RAMP.html>

THE UNIVERSITY OF ARIZONA

**2006 USDA RISK AVOIDANCE AND MITIGATION PROGRAM (RAMP) PROJECT**

COOPERATIVE EXTENSION

**ARIZONA PEST MANAGEMENT CENTER**

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[Objectives](#)  
[Reports](#)  
[Publications and Outputs](#)  
[Lygus Survey](#)  
[Links](#)

**DEVELOPING AND IMPLEMENTING FIELD AND LANDSCAPE LEVEL REDUCED-RISK MANAGEMENT STRATEGIES FOR LYGUS IN WESTERN CROPPING SYSTEMS**

**Citation**

Ellsworth, P., P. Goodell, M. Parajulee, S. Bundy, S. Naranjo, J. Bancroft, J. Blackmer, Y. Carriere, A. Fournier, L. Godfrey, J. Hagler, J. Palumbo, J. Rosenheim, D. Kerns. *Developing and Implementing Field and Landscape Level Reduced-Risk Management Strategies for Lygus in Western Cropping Systems*. USDA Risk Avoidance and Mitigation Program (RAMP), Project # ARZT-358320-G-30-505, CRIS# 0207436. \$2,500,000.(Sept 2006 – Aug 2010).

Project Collaborators: Andrew Corbett, Pierre Dutilleul, Bob Hutmacher, M. J. Jimenez, R. Molinar, Shannon Mueller, Russ Tronstad.

**Project Abstract**

Recent gains in IPM have been substantial, largely through adoption / integration of new insect control technologies.

**Project Reports**

2008

- [2008 Interim Report](#) (PDF, 111KB, 7 pages). This report provides a complete overview of year-two outcomes, research and extension activities, publications, and leveraged resources for the RAMP project. This is a modified version of the brief report that was submitted to USDA-CSREES.
- [2008 RAMP Outcomes Tracking Matrix](#) (PDF, 68KB, 26 pages). This report provides project-by-project objectives, research and education activities, impacts and leveraged resources as reported by project PIs.
- [2008 RAMP Leveraged Funding Summary](#) (PDF, 148KB, 5 pages).
- [2008 RAMP Experimental Results Summary](#) (PDF, 124KB, 26 pages). This is a summary of experimental results to date, presented project-by-project.
- [2008 Lygus Small Plot Efficacy Trials](#) (PDF, 1.1MB, 34 pages). This report is specific to the RAMP sub-project headed by Ellsworth: "Determination of deployment options for reduced-risk and other effective chemistry for Lygus control in cotton."

2007

- [2007 Final Interim Report](#), (PDF, 156 KB, 8 pages). This report provides a complete overview of first year outcomes, research and extension activities, publications, and leveraged resources for the RAMP project. This is an expanded version of the brief report that was submitted to USDA-CSREES.
- [2007 RAMP Outcome Tracking Matrix](#) (PDF, 140KB, 18 pages) This report provides project-by-project objectives, research and education activities, impacts and leveraged resources as reported by project PIs.

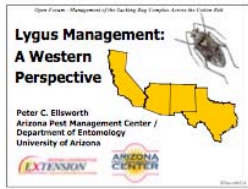
**Publications and Outputs**

**Presentations**

- [Ellsworth, P. RAMP Overview and Goals \(PDF version\)](#). (4 slides/page with notes, 964KB) [Powerpoint version](#) (1.9MB). Presented at RAMP Team organization meeting, Pacific Grove, CA. April 15, 2007.
- [Ellsworth, P. Lygus Management: A Western Perspective](#). (4 slides/page with notes, PDF file 2.4MB) Presented by invitation at the Open Forum - Management of the Sucking Bug Complex across the Cotton Belt, 2008 Beltwide Cotton Conferences, Nashville, Tennessee. January 9, 2008.
- [Ellsworth, P. Plant Bug Thresholds in Arizona Cotton](#). (2 slides/page with notes, PDF file 3.0MB) Presented by invitation at the Plant Bug and Stink Bug Management Workshop, 2007 Beltwide Cotton Conferences, New Orleans, Louisiana. January 10, 2007.

**Publications**

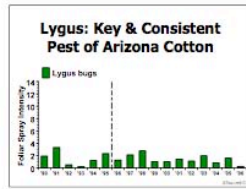
- [Anonymous, 2008. Multi-state effort aimed at suppressing lygus in cotton](#). Western Farm Press, December 30, 2008.
- [Anonymous, 2008. Fully selective insecticides preferred for lygus, whitefly control in low desert cotton](#). Western Farm Press, November 5, 2008.
- [Cline, H., 2008. Lygus likely to come from neighboring crops in 2008](#). Western Farm Press, June 10, 2008.
- Goodell P.B. and Ellsworth P.C. 2008. Second International Lygus Symposium. *Journal of Insect Science* 8:49, available online: <http://insectscience.org/8.49/>
- [Katz, M., 2008. San Joaquin Valley cotton growers offered survival strategies for 2009](#). Western Farm Press, December 2, 2008.
- [McGinley, S. 2008. RAMPing Up Against Lygus. 2007 Arizona Agricultural Experiment Station Report. University of Arizona, College of Agriculture and Life Sciences, Tucson, AZ.](#) (PDF, 3.4MB)



My comments are decidedly "Arizonan"; however, I will do my best to include comments and contributions from my Western colleagues, Drs. Pete Goodell (CA), Scott Bundy (NM), and Megha Parajulee (TX).

This presentation was invited by organizers of the Hemipteran Management Workshop as part of the 2008 Beltwide Cotton Conferences. The subject of this presentation is Lygus management in western cotton.

30 min. / 100



There has been much talk about "the rise of the bugs" in cotton pest management across the cottonbelt. While that "talk" is justified, it is also clear that Lygus have been a fairly consistent target for Arizona cotton growers requiring, on average, about 1-2 sprays most years.

So Lygus are not new pests to Arizona cotton...

[Chart is of statewide average foliar spray intensity (no. of sprays) to control Lygus since 1990; derived from Ellsworth et al. 2007]

**But, Proportionally More Important**



## Please Remember:

- I need your help to document activities, results, products and impacts
- Products and impacts are different, but equally important, in the scientific & agricultural communities
- Our success will be measured by what we discover, ***how much we influence change in Lygus management in the West***, and how well we communicate

## RAMP Listserv

- [lygusramp@CAL.S.arizona.edu](mailto:lygusramp@CAL.S.arizona.edu)
- Share research results, new publications, meeting information, etc.
- Pose questions to the RAMP team
- Keep the dialog alive!

## Questions?

