


## APMC Activities Update

- Pest Management Strategic Plans
  - National School IPM PMSP (nearly complete)
  - Desert Cotton PMSP (in progress)
  - Desert Turf PMSP (proposal stage)
- WERA-069 2007 Regional IPM Meeting
- Western IPM Center Advisory Committee
- Western Region School IPM Working Group
- ACPA PCA Manual Project update
- APMC Website: what's new?




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**Update on major activities of the APMC since the last meeting of the IPM Coordinating Committee.**

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## Beyond IPM (collateral benefits)

- 2007 Extension Faculty Survey: Program Evaluation (Prog Eval WG)
- Professional Dev. In-Service (April 1-2)
- Needs Assessment training for new faculty
- Entomology Dept. Seminar: Trends in Competitive Funding




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**AI's role as IPM Program Manager provides additional benefits in other, non-IPM activities as well. In particular, his expertise in program evaluation has been of assistance in faculty training and in-services.**

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## Chronology

- 5/03, Concept proposed to EC
- 1/04, 1st funding for APMC approved
- 4/04, IPM CC convened; IPM Coordinator appointed
- 5/05, Dr. Al Fournier hired as IPM Prog. Mgr.
- 6/06, 1st APMC Summit convened (120 attend)



EC Brief, July 2, 2007


**The concept for the Arizona Pest Management Center was conceived by John Palumbo, Paul Baker, and myself in response to various changes in the federal climate, new opportunities that resulted, and a need to develop transparency with respect to our federal 3(d) obligation in IPM.**

**The concept was proposed to the Executive Council, the last time we met with the group, four years ago. Our first formal funding through the Western IPM Center was approved shortly thereafter. Our IPM Coordinating Committee was first convened later that year and plans were undertaken for recruitment of an IPM Program Manager. AI has been with us two years now & we thought it a good time to take stock and present our progress and some new ideas to the Executive Council today.**

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## CALs Commitments to APMC

- Divestiture of 3(d) moneys from Kerns & Ellsworth lines
- Release of these funds for program use
- Investment in 50% salary and operations for IPM Program Manager
- Appointment of Ellsworth as IPM Coordinator



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**Four years ago, CALS made certain commitments to the concept we proposed then. First, it was agreed that the 3(d) moneys vested in the Ellsworth and Kerns lines needed to be replaced by state funds. This, in turn, was to have released these funds for programmatic use in IPM. We sought a College commitment (50%) towards a full-time new faculty line, IPM Program Manager. Instead, the College offered this support from the newly freed 3(d) funds.**

**Later Ellsworth was appointed IPM Coordinator after the IPM CC meeting was held.**

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## Honoring Our Commitment

- **Opportunity**
  - Changes in federal climate
- **Focused Excellence**
  - Re-organize our resources
- **Relevancy**
  - Develop & deliver premiere IPM programs




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**Our commitment to the College was to seize on an opportunity for extramural funding of the APMC (and the other 50% of the IPM Program Manager faculty line) due to federal reorganization of IPM resources. We also committed to re-organizing resources around the structure shown, focusing our limited resources on programs with achievable goals. Our commitment extends to developing the best and most relevant IPM programs possible.**

**All this was done in an environment of transparency and with the goal of making Arizona's IPM programs as competitive as possible.**

## Honoring Our Commitment

- Re-organize fiscal & human resources
- Improve Federal reporting and communication
- Enhance visibility
- Create partnerships (provide leadership)
- Evaluate (needs and outcomes)

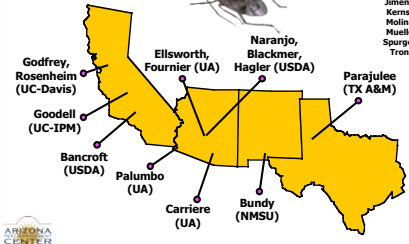


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**Our commitments are many and continue to evolve under the direction of the IPM CC. However, in order to be better positioned to compete for federal and other extramural resources, we have placed emphasis on these five areas:**

**Re-organization,  
Communication,  
Enhancement,  
Partnerships,  
Evaluation.**


## RAMP Team



**Collaborators**

- Corbett (Corbett Learning)
- Dutillieu (McGill)
- Huttmacher (UC-Davis)
- Jimenez (UC-CE)
- Kems (TX A&M)
- Molina (UC-CE)
- Mueller (UC-CE)
- Spurgeon (USDA)
- Tronstad (UA)

- Godfrey, Rosenheim (UC-Davis)
- Goodell (UC-IPM)
- Bancroft (USDA)
- Palumbo (UA)
- Carriere (UA)
- Ellsworth, Fournier (UA)
- Naranjo, Blackmer, Hagler (USDA)
- Parajulee (TX A&M)
- Bundy (NMSU)





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**This is the project team for the \$2.5M grant rec'd from USDA-CSREES Risk Avoidance & Mitigation Program. Ellsworth is lead PI and UA the lead institution for this 4-year 4-state project. There are 13 PIs cooperating and a number of public and private cooperators.**

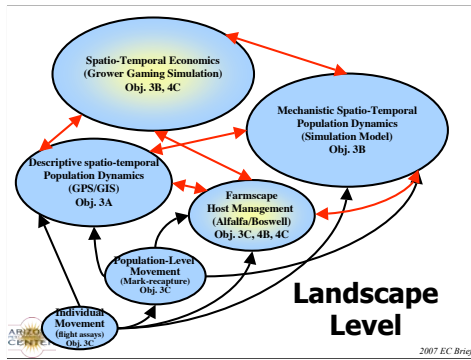
**The goal is to develop a comprehensive research and outreach approach that will allow us to develop areawide suppression of Lygus bugs through improved field practices and landscape manipulation. This requires a gamut of fundamental and applied investigations into the movement potential and control of Lygus in at least 10 crops.**

- **USDA-CSREES, Risk Avoidance & Mitigation Program (RAMP)**
- **\$2,500,000 over 4 years**
- **Developing and implementing field and landscape level reduced-risk management strategies for Lygus in Western cropping systems**
- **Scope**
  - 4 Western States, **AZ (Lead)**, CA, NM, TX
  - 7 Institutions, UA, UC-Davis, UC-IPM, NMSU, T, A&M, USDA-ARS, McGill University
  - 13 PI's, many collaborators
  - Upland & Pima cottons, seed alfalfa, vegetable & vegetable seed crops, eggplant, chiles, guayule, lesquerella, dry beans

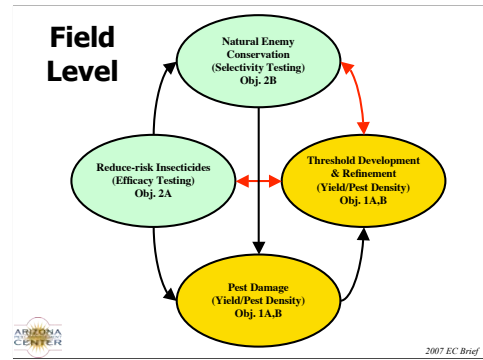
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**The particulars.**



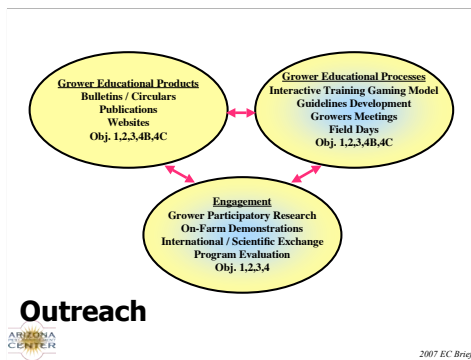
Alternate view of RAMP Grant and its many subprojects. These are the “Landscape Level” components.

**Figure 4.** A conceptual flow-diagram of the proposed project delineating components of the three major elements (field-level research, landscape-level research and outreach) and their interrelationships. Arrows depict the flow of information; black arrows indicate a one-way flow and red arrows depict flows with feedback. Within the **Landscape-Level** domain the size of the ovals indicate the spatial context of that element from very localized (e.g., individual movement) to regional and multi-state (e.g. spatio-temporal economics). **Field-level** components feed into the landscape-level by governing localized population dynamics and management practices that ultimately determine population processes and management strategies within larger landscape contexts. Feedback occurs when landscape-level processes result in lowering of Lygus risks such that field-level practices become more functional (e.g., natural enemy conservation & biological control). **Outreach** activities bridge field- and landscape-level components and provide critical feedback to ensure that research is relevant and provides practical solutions to risk mitigation while also fostering an improved fundamental understanding of pest impact, behavior, biology, and ecology at multiple spatial scales. See Appendix 8a for objective numbers/letters and associated colors.



Alternate view of RAMP Grant and its many subprojects. These are the “Field Level” components.

**Figure 4.** A conceptual flow-diagram of the proposed project delineating components of the three major elements (field-level research, landscape-level research and outreach) and their interrelationships. Arrows depict the flow of information; black arrows indicate a one-way flow and red arrows depict flows with feedback. Within the **Landscape-Level** domain the size of the ovals indicate the spatial context of that element from very localized (e.g., individual movement) to regional and multi-state (e.g. spatio-temporal economics). **Field-level** components feed into the landscape-level by governing localized population dynamics and management strategies within larger landscape contexts. Feedback occurs when landscape-level processes result in lowering of Lygus risks such that field-level practices become more functional (e.g., natural enemy conservation & biological control). **Outreach** activities bridge field- and landscape-level components and provide critical feedback to ensure that research is relevant and provides practical solutions to risk mitigation while also fostering an improved fundamental understanding of pest impact, behavior, biology, and ecology at multiple spatial scales. See Appendix 8a for objective numbers/letters and associated colors.



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### APMC Foundation Awards

			Term	Award	IDC
	Arid Southwest IPM Network	Ellsworth, Fournier, Palumbo, Baker	5 yrs	100,000	20,000
	Crop Insect Losses Working Group	Ellsworth, Fournier, Palumbo	5 yrs	50,000	10,000
				<b>150,000</b>	<b>30,000</b>

**Because the IPM Program Manager position is only 50% funded through local, 3(d) funds, we had to establish lines of support through the Western IPM Center in Davis, CA. These two grants and their associated activities form the core foundation of support for this position and the APMC.**

**We have been very successful in nurturing these lines and securing consistent, on-going support; however, these grants are often year to year or at best for 2 year terms. This makes us vulnerable.**

**An addition \$70K has recently been added.**

### Stakeholder Engagement

			Term	Award	IDC
Cotton Pest Management Strategic Plan	Western IPM Center (UC-Davis)	Ellsworth, Fournier, Palumbo, Baker	1 yr	12,000	2,400
National School IPM PMSF	Western IPM Center (UC-Davis)	Gouge, Fournier, Green	1 yr	10,000	2,000
Western School IPM Working Group	Western IPM Center	Gouge, Snyder, Fournier et al.	1 yr	10,000	2,000
				<b>32,000</b>	<b>6,400</b>



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A broad consistent theme across all IPM funding, indeed most of Extension and now Research funding federally, is stakeholder engagement for purposes of priority setting (program identification) and evaluation (impact assessment). Without this effort, many of our programs would fail to compete extramurally. We envision continued, year-to-year, support for these activities, such as Pest Management Strategic Planning and regional working groups. Another \$31K has been added.

### APMC Enabled Projects

			Term	Award	IDC
Reduced-Risk IPM for Melon Aphid	USDA Pest Management Alternatives	Palumbo, Jones, Teegenstrom	3 yrs	178,700	35,740
Measuring Adoption of IPM	USDA Regional IPM Competitive Grant	Ellsworth, Carriere, Fournier, Palumbo	2 yrs	60,000	0
Areawide Lygus management	USDA Risk Avoidance and Mitigation Program	Ellsworth, Palumbo, Carriere, Fournier, et al.	4 yrs	2,500,000	504,351*
Whitefly Resistance Management	NRI	Carriere, Tabashnik, Dennehy, Ellsworth et al.	3 yrs	359,000	175,910
<b>Total Competitive</b>				<b>3,279,700</b>	<b>752,401</b>

\*\$248,513 to partner institutions

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Probably the most exciting development to have come from the APMC re-org has been the enhanced competitiveness of our efforts. These projects were all in some way enabled or synergized by the APMC. Most notable of course is the very large, multi-institutional RAMP grant that we lead. But our efforts have activated efforts that span the continuum of pure outreach to pure research in IPM.

### APMC Supported Projects

			Term	Award	IDC
Nematodes for Urban Pest Control	USDA Regional IPM Competitive Grant	Stock & Gouge	2 yrs	60,000	12,000
Cotton Pesticide Data 2004	Western IPM Center (UC-Davis)	Baker	1 yr	5,000	1,000
Enhancing Agricultural Productivity Through Educational Partnerships	Technology Research Initiative Fund	Brown et al.	1 yr	125,360	0
				<b>190,360</b>	<b>13,000</b>

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In addition to those efforts directly enabled by Center involvement, we also have a number of efforts that have borne fruit as a result, in part, of support from the APMC. As they say, a high tide floats all boats. It is our goal to produce visibility for our programs such that many benefit if only indirectly.

### IPM 3(d) Funds

FF Year	Grants Awarded		Fournier Commitment		Total Expended	3(d) Allocation
	Qty.	Amount	Salary*	Operations		
2005	7	39,400	16,038	0	55,438	100,408
2006	8	50,000	37,724	0	87,724	100,408
2007	9	46,000	38,593	5,000	89,593	100,408

\*\$4,103 in salary savings generated.

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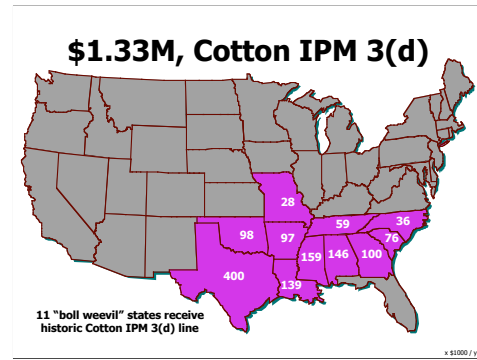
The IPM CC decided to formalize a mini-grant program with the residual 3(d) funding. In the last 3 years, we have awarded 24 IPM projects over \$135K. Each award is typically quite small, but serve to initiate new efforts in IPM leveraging other resources, or provide capstone moneys to existing efforts. Most of the balance of the 3(d) moneys goes towards Al's salary and operations. [Note the differences between expenditures and allocations. These carry-overs were unknown to us until recently.]

### APMC Summary

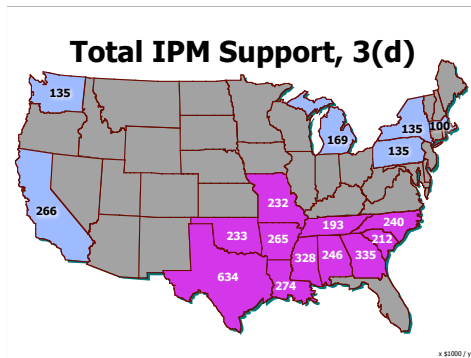
IPM Effort	Amount	IDC
APMC Foundation Awards	150,000	30,000
Stakeholder Engagement	32,000	6,400
APMC Enabled Projects	3,097,700	716,001
APMC Supported Projects	190,360	13,000
<b>Total Competitive</b>	<b>3,470,060</b>	<b>765,401</b>
Extension Support	27,500	
<b>Total IPM Effort</b>	<b>3,497,560</b>	

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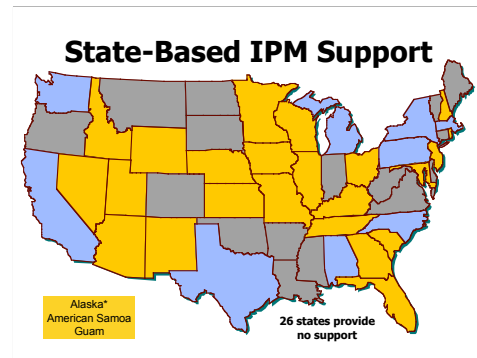
Over this period, and only accounting for those grants for which we have the most information, we can see a rather impressive return on the College's investment in the APMC. Our programs have been exceptionally successful in capturing highly competitive and highly prized federal grant dollars. But we can do even better, with continued investment in the APMC. Recent additional extramural investments total \$101K.



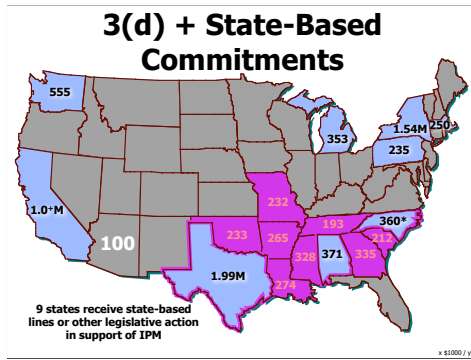
As a matter of perspective, we thought it would be instructive to examine support structures for IPM nation-wide. AI and I conducted a very brief survey of IPM Coordinators from across the country and did some additional research. Because of a historical quirk whereby boll weevil was NOT present in AZ at the time the formula was constructed, we do not receive any "Cotton IPM" 3(d) funds as do these 11 cotton states. Over one million is distributed each year.



Looking at the total 3(d) IPM support to these and a sampling of other states, we start to see a pattern emerge wrt funding. It will become apparent in a moment why we've selected these other states to examine. But just looking at total 3(d) IPM support, even Massachusetts with a land mass smaller than Maricopa County receives as much as Arizona (\$100K).



In our survey, we asked if there were any state-based initiatives or lines of support that were provided to their IPM programs beyond some nominal leveraged faculty support. Of the 35 responses, only 9 cited significant state-based investments in their IPM programs. Based on my own knowledge, of the 17 that did not respond, I believe it likely that none of these receive support either (26 states in orange reported no investment). Note the pattern of states (blue) that do receive state-based commitments. They tend to be our largest agricultural or academic centers for IPM in the country.



The states in blue receive significant state-based commitments to their IPM programs. This map shows a total 3(d) and estimated state investment in IPM. Now, even Massachusetts receives 2.5 times the investment in IPM than does Arizona! And most states have a 3.5 to 20-fold investment over our own here in Arizona. These 9 states do tend to represent some of our best institutions academically and best IPM programs nationwide. Cornell, Texas A&M, UC system, Michigan State, North Carolina State, Auburn, Washington State and Penn State have made major leveraging investments in IPM.

### State-Based Commitments

- State Initiatives (TX, NY, CA, MI)
  - Project GREEN (\$184K, MI)
- Targeted Program dollars (NY, AL, CA, TX)
  - Fire ant management (\$150K in AL, \$350K in TX)
  - Community IPM (line offered by state senator, NY)
- Partnership with state's dept. of ag & nat. res. (PA, CA, TX, MA, NY, WA)
  - Washington State Commission on Pesticide Reg., \$420K
- Broad-based marketing orders, check-off systems or user fees (NC, TX)
  - Texas Pest Management Assoc., personnel, \$250K
  - "Nickels for Know-how", \$1.2M annually

So how have they done this? The vehicles for investment are diverse. Some start as state initiatives earmarked for IPM and often later turn into base funding (e.g., TX). Project GREEN (MSU) capitalizes on a very politically active segment of there clientele interested in the Green / Landscape industry. Some are parlayed from very specifically targeted program dollars, as with fire ant management in the south or urban efforts in NY. Some reflect broad partnerships with the state and their agencies. And a few have been successful at developing funding streams dedicated to IPM (e.g., TX) or that support agriculture broadly (e.g., NC).

### Goals

- Establish the University of Arizona's IPM program as one of the nation's premier efforts in economic, environmental, and health risk reduction due to pests and pest management tactics
- Develop the Arizona Pest Management Center as the hub for IPM research & outreach resources in the Western U.S. and as a resource for IPM in arid environments around the world

After 4 years, what are our goals today for the APMC and UA's IPM programs?


### Constraints

- Full accounting control of federal IPM 3(d)
- APMC Human Resources
  - IT / Data Management / Web staff line
  - 0.5 FTE IPM Program Manager, state line
  - Interdisciplinary campus & county IPM faculty
- Access to significant & consistent state-based operating dollars

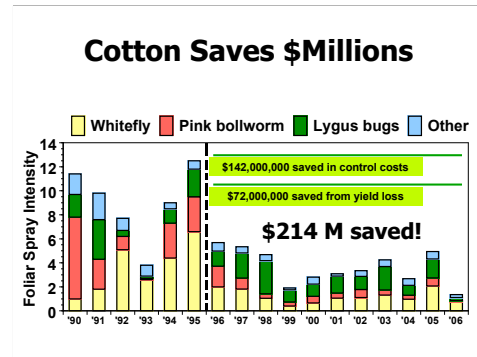
The constraints we have in reaching our goals are easy to define, though not necessarily easy to overcome. We need full accounting control over the IPM 3(d) funds. Placing control at MAC will provide us the access needed to effectively report to our Federal partners. We also have significant human resource needs. A state of this size and complexity and burgeoning population will need to have more feet on the ground to bring the best we have to offer to citizens (& students) of this state. Lastly, we need significant and consistent state-based operating dollars.

## IPM, An Interdisciplinary Environmental Science

- Sustainability
- Agricultural change
  - Biofuels
  - "New" crops
  - Novel crops
  - Food safety
- Urban growth
  - Green industry
  - Consumer interest in agricultural inputs and outputs
  - More people, more pest problems (e.g., invasives)



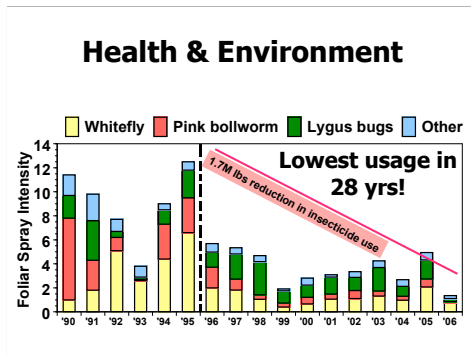
**"But we're already doing such a good job!" you say. True, but our effort is still overall very small and not nearly upsized to the point where we can deal with a wave of change that is already upon us. IPM is an agricultural science, but don't be trapped into thinking that's all it is. It is an environmental science that will take us into the future where issues of sustainability are all around us every day! Where major agricultural change is likely, and where urban pressures will only intensify consumer interest in the source, and quality of their food as well as the safety of their children and environment. Demand for IPM (unlike traditional agricultural programs) is only going to increase.**



**What we have done so far is significant and often held up by this College and others around the country as a model for successful transformation of an entire industry.**

**Cumulatively, we have saved cotton growers over \$214M over the last 11 years in control costs and yield.**

Statewide average cotton foliar insecticide spray intensity by year and insect pest (Ellsworth & Fournier, 2007).



**And, we have lowered the environmental burden of broadly toxic insecticides from a 28-year high in 1995 to a 28-year low in 2006, reducing usage by 1.7 million pounds.**

**But we can achieve more! The benefits to this state, our citizens, students and College will be immeasurable.**

## Getting from Here to There



- Decision Package
  - Other legislative action
- IPM Endowment
  - Chair
  - Broad programmatic support
- ADA / ADEQ / UA Partnership
  - Feed & fertilizer mill tax
  - Pesticide sales and/or user fees
  - Line item legislative support for IPM

**So how do we get from here to there, and successfully remove the remaining constraints in advancing our goals in IPM research, education, and outreach?**

**Only last week, after 40 years, the bald eagle, once threatened in part by the widely-used insecticide, DDT, was removed from the Endangered Species list. This progress did not occur overnight.**

**To advance our goals, the model is clear. A greater state investment is needed. A decision package, active endowment for IPM and significant state agency partnership will be needed.**



The Arizona Pest Management Center (APMC) as part of its function maintains a website, the Arizona Crop Information Site (ACIS), which houses all crop production and protection information for our low desert crops, including a PDF version of this presentation for those interested in reviewing its content.

Photo credit: J. Silvertooth

### Constraints = Proposal

- ✔ Full accounting control of federal IPM 3(d)
  - APMC Human Resources
    - IT / Data Management / Web staff line
    - ✔ - 0.5 FTE IPM Program Manager, state line
    - Interdisciplinary campus & county IPM faculty
  - Access to significant & consistent state-based operating dollars

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“Constraints” as shown to the EC constitute the core of our proposal to them last July. Since then,

We now have full accounting control over the 3(d) funds at MAC. This has already helped inform our efforts so far with specific information about funded efforts and carryover funds that we were otherwise unaware of.

The only other progress has been a 0.10 FTE allocation of state-based funding to AI’s position.

### 2007 IPM Awards

PI	Awarded	Balance	Adjustment
Fournier/1080	8,000	0	
Fournier/ACIS	3,000	-312	
Gouge/Children's Env Health	4,000	8	
Kubota/Grafting Melons	7,000	1463	
Li/Q Whitefly Detection	6,500	62	
Northam/Weed Manual update	4,500	0	2287
Orr/Bufflegass	2,500	-265	
Umeda/Billbugs	4,000	135	
Willot/Mosquitoes	6,500	1	
<b>Total 3(d) IPM Awards</b>	<b>46,000</b>		
Shalau/Pesticide Applicator Training	3,700	1438	

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Above is an accounting of the mini-grant program funded from the APMC’s 3(d) moneys as well as some PAT funding.

There are balance discrepancies at the end of September.

The Northam commitment was pulled back when his position changed.

### IPM 3(d) Budget Report FY 2006-2007

3(d) funds received	100408
IPM program mgr	38387
Operations	3662
IPM projects	46000
CYSDV	520
Adjustments (Northam)	2287
<b>Total for FY</b>	<b>14126</b>
<b>Carryover</b>	<b>85236</b>
Fournier salary savings (05-06)	4103

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Synopsis of account activity in last federal fiscal year.