

Name of Proposed Unit: **Arizona Pest Management Center** (<http://cals.arizona.edu/apmc/>)

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Proposal Team Membership:

Paul Baker (Extension Specialist, Entomology)
Pat Clay (Field Market Development Specialist, Valent USA Corporation; stakeholder or client)
Peter Ellsworth (Extension Specialist, Entomology, Maricopa Agricultural Center)
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Richard Farmer (Database Specialist, Senior; classified staff)
Al Fournier (IPM Program Mgr. / adj. Asst. Specialist, Maricopa Agricultural Center, Entomology)
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Chris Jones (ANR Agent, Gila County)
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Rick Melnicoe (Director, Western IPM Center, Univ. Calif. – Davis; stakeholder / partner)
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Affected Units:

All of the “affected” units are ones that have faculty as members of the Arizona Pest Management Center.

Department of Entomology
Department of Plant Sciences
Department of Agricultural and Resource Economics
Department of Agricultural and Biosystems Engineering
Department of Soil, Water, and Environmental Science
School of Natural Resources
Cooperative Extension
Statewide County Offices of Cooperative Extension
Agricultural Centers
Maricopa Agricultural Center
Yuma Agricultural Center
Safford Agricultural Center
Campus Agricultural Centers

Integrated Pest Management

“Integrated Pest Management, or IPM, is a long-standing, science-based, decision-making process that identifies and reduces risks from pests and pest management related strategies.” This is the federal definition for IPM. The National Roadmap for IPM, a policy document developed by USDA and US-EPA with stakeholder input, goes on:

It coordinates the use of pest biology, environmental information, and available technology to prevent unacceptable levels of pest damage by the most economical means, while posing the least possible risk to people, property, resources, and the environment. IPM provides an effective strategy for managing pests in all arenas from developed agricultural, residential, and public areas to wild lands. IPM serves as an umbrella to provide an effective, all encompassing, low-risk approach to protect resources and people from pests.

IPM is a multi-disciplinary science that has its conceptual underpinnings and implementation roots in Arizona starting with the first federally supported commercial demonstration in cotton in 1971. That first very successful federal investment eventually developed into infrastructural support to each Land-Grant institution in the form of formula funding in support of IPM implementation and outreach. Recent changes in federal policy have resulted in the immediate conversion of these state formula funds into a competitive Extension IPM grant program—a change that could greatly benefit the state of Arizona because of our capacity for competitiveness in IPM through the Arizona Pest Management Center (APMC). This white paper describes the history, purpose and initial outcomes of the APMC and outlines the critical needs to position the University of Arizona to become a national premiere center of distinction for IPM.

The Arizona Pest Management Center: History, Purpose and Outcomes

The Arizona Pest Management Center (APMC) was formed and recognized within the College of Agriculture and Life Sciences starting in May of 2003. The concept was grounded in three principles: Opportunity, Focused Excellence, and Relevancy. Grant opportunities at the time were being decentralized to regions, and our re-organization allowed us to immediately capitalize and capture much-needed and consistent funding from the Western IPM Center (total: \$244,836 to date).

By focusing and re-organizing our limited resources on programs with achievable goals, our scientists could better allocate their time and resources to interdisciplinary teams charged with translational science, implementation, and outreach in specific contexts for IPM. As a result, our programs have received national and worldwide attention. Cotton IPM in Arizona has enabled biotechnological and ecological advances such that local growers have saved cumulatively over \$250 million since 1996 while reducing the usage of insecticides by over 1.7 million pounds (1995 v. 2006). Our programs implementing IPM to control pests in many Arizona K-12 schools have received national awards from EPA and other organizations and have helped reduce risks of pesticide poisonings in schools and the potential for asthma-related absences and illnesses in our school children. Our cross-commodity IPM programs that involve management of whiteflies in melons, vegetables and cotton are cited in textbooks today as models for the implementation of IPM and resistance management in complex agroecosystems. Our collective efforts have helped translate the science of resistance to transgenic technologies into national resistance management and mitigation policies by EPA and industry. These are looked upon worldwide as models for the establishment and transfer of biotechnological products in other countries.

With initially scant resources, the APMC has helped faculty to develop and deliver premiere IPM programs that are relevant to and used by Arizona's citizens, improving their lives and livelihoods while protecting the environment and informing the public and policy-makers on pests, pesticides and pest management technologies. The APMC was always envisioned to be a direct two-way link between the federal IPM program and the citizens of Arizona, channeling federal resources to our state while providing our citizens a voice in determining regional and national IPM priorities. The relevancy of our programs to our citizens and stakeholders is critical to our future success in garnering local support and in establishing the APMC as a competitive force in regional and federal granting programs.

The APMC commitments to our constituents included re-organization of fiscal and human resources, increased transparency and improved quality of federal reporting and communication (a requirement of our federal formula dollars), enhanced visibility within our college, the state and beyond, capacity building in the vital areas of stakeholder needs assessment and evaluation of program outcomes, and creation of important partnerships that provide leadership in IPM and agricultural, urban and natural pest management communities. In so doing, we have created a center of excellence where close partnerships have been formed with industry, state organizations (Arizona Department of Agriculture, Arizona Department of Environmental Quality, Office of Pest Management), trade organizations (Arizona Crop Protection Association, Western Growers Association), regional networks (Western IPM Center, Western Plant Diagnostics Network, Arid Southwest IPM Network), and federal partners (Centers for Disease Control & Prevention, USDA, EPA, US-Forest Service). These stakeholders help support and inform our programs and leverage our modest human and fiscal resources. As reported to the College of Agriculture and Life Sciences (CALs) Executive Committee in July 2007 (see Reference) these organizational changes have not only addressed our initial commitments, they have dramatically increased our effectiveness and helped grow our research and outreach programs, helping us to secure over \$4.8M in competitive grants for IPM.

Proposed Response to Changes in Federal Funding for IPM

In federal FY08-09, the national Extension IPM (EIPM) program announced the discontinuation of the federal 3(d) IPM program, which formerly allocated Extension IPM funds according to a fixed formula established in the 1970's. In its place, as mandated by the 2008 Farm Bill, EIPM will implement a nationally competitive program for this IPM resource estimated to be ca. \$9.5 million. The APMC has been preparing for this change in the federal climate for six years. Our proposed re-organization will put UA and the APMC in an ideal position to capture a larger share of these federal infrastructural dollars than most states or institutions. Furthermore, our federal partners are currently seeking comment and input on this new competitive program. The IPM Coordinating Committee (a 17-member multi-disciplinary advisory board that guides the function of the APMC) has already met and discussed the institutional action needed now to capitalize on this major change in federal policy.

Critical Needs

The APMC is a center of distinction and in need of institutional commitment (minimally) and additional investment (hopefully), particularly at this key time of federal fiscal transition for IPM. We have identified the following critical changes needed to broker and build upon our significant successes and establish the University of Arizona's APMC as one of the premiere centers for IPM in the country:

- 1) The Arizona Pest Management Center needs full UA institutional recognition as the interdisciplinary center for IPM, in addition to its current status within CALS;
- 2) The APMC needs to be our institutional designee and authority for formulating and addressing the federal EIPM call for proposals in Arizona. The APMC is a multidisciplinary, collaborative

organization recognized by our citizens and stakeholders, and organizationally provides the most efficient way to interface with the new competitive federal EIPM program;

- 3) Under the old system, each state had a designated state IPM coordinator responsible for interfacing with the federal IPM program. To sustain this critical link to federal IPM programs, we need support by UA for the assignment of the Director of the APMC as the point person and representative to the newly formed federal competitive EIPM program;
- 4) Success of the APMC in this new federal climate is virtually assured. However, the APMC needs commitment for institutional fiscal back-stopping should any exigency occur;
- 5) Funding is needed to provide ongoing support to the IPM Program Manager, a dedicated appointed faculty member who manages day-to-day operations of the APMC. This position was previously funded through 30% IPM formula funds, 50% competitive grants and 20% state funds;
- 6) The APMC currently serves as the developmental and outreach arm for IPM in Arizona. Large opportunities exist for growing this center so it creates an environment ripe for academic excellence. Several initiatives will be necessary:
 - a. *Student recruitment.* At present, among others, the APMC is made up of key members in Plant Sciences and Entomology, two departments with national standing and recognition (#1 & #2, respectively). However, no specific investment is made to create the next generation of interdisciplinary scientists in IPM who will usher in a new era of food productivity and safety, human and animal health safety from pest-vectored diseases and pest-associated illnesses, and environmental protection using cutting edge innovations of biotechnology, ecology and more. Graduate assistantships, internships, and studentships are urgently needed to help address this unmet need and capitalize on the burgeoning capacity of the APMC.
 - b. *Faculty recruitment.* IPM, as an interdisciplinary program, is largely made-up of faculty who represent minority interests in their respective home departments or units and who principally have Extension functions. As such, competition with the larger unit for scant recruitment priorities is exceptionally difficult. Institutionally, however, we could synergize an academic program of distinction if we could recruit as few as four key IPM faculty to support campus curricular needs, graduate student mentoring, technology development, translational research and outreach. The APMC should be given a recruitment voice in the University's new recruitment process, presumably one that flows from the system of transformation currently underway.

The proposed changes will provide great opportunities for graduate student training, curriculum development, and capacity building in IPM discovery, while bridging to an already successful effort in translational science and outreach. By coordinating IPM for the University and not just the CALS, we will be more efficient and can partner with others, e.g., the medical school in outreach or research on mosquito-borne diseases like West Nile Virus. IPM issues of growing concern in Arizona include increasing threats to our food supply, our natural lands, and to human health from invasive pests and a shift in agricultural crops that demands pest management research in new crops (e.g., for biofuels). Urban concerns about food safety and security, school concerns for vulnerable children and their exposure to pests and pesticides, Arizona's environmental concerns for public lands, parks and forests, and new agricultural concerns for profitability and sustainability will all serve to create huge demand for our programs. With the APMC, we have built the base of competitiveness that has prepared us to capitalize on the changes in federal IPM funding, making this a unique time of opportunity for the UA. We can capture significantly greater federal resources for IPM, which will greatly augment our ability to address the needs of our citizens through research and outreach, and will provide additional resources to recruit

and support outstanding graduate students. However, to fully take advantage of this opportunity, institutional recognition and support will be crucial.

This proposal addresses the UA's strategic plan in multiple dimensions: (1) Support academic excellence by leveraging intellectual capacity in translational research, technology transfer and outreach with key recruitments of IPM faculty and graduate students, (2) Augment quality of life and societal impact through programs of distinction in IPM, a part of our Land-Grant mission, (3) Provide world-class, interdisciplinary IPM research and outreach that touches upon at least four of the nine areas identified in the strategic plan (Climate, Environmental, Water, and Energy Sustainability; Biosciences and Biotechnology; Law, Public Policy and Entrepreneurship; and Youth Development Programs), (4) Steward valuable natural resources with development and deployment of environmentally sensitive IPM programs, (5) Build on our existing strength and capitalize on our unique environment through IPM programs that have and will continue to translate to people and places the world over, and (6) Provide major partnerships with state and federal agencies as well as stakeholder groups, all of which are concerned with pests, the damage they cause, and the practices used to control them.

Process for Consultation

The process for consultation on this proposal was accelerated because of two convergent needs: (1) the short UA transformation timeline, and (2) the recent announcement by USDA-CSREES on the conversion of the federal formula funding for IPM into a competitive grants program. The APMC is governed by a 17-member IPM Coordinating Committee (for more details, please visit: <http://cals.arizona.edu/apmc/>) that advises the state IPM Coordinator. This advisory board met on the transformation process on 2 Oct 2008. Minutes were published on the web and made available to the full APMC membership, including Extension administration and department heads. After initial drafting, the IPM Coordinating Committee was given a very short time to make final comment before submission on 13 Oct. All elements contained herein are consensus of the group, which represent Extension Administrators, Extension Specialists, Research Scientists, Professors, Appointed Personnel, Extension County Agents, Classified Staff, and most importantly external stakeholders (see proposal team list). As such, this proposal was broadly consultative and without dissent. However, with additional time, further consultation with department heads and college administration would be particularly valuable. Update: further input was sought and received from the Department of Entomology and incorporated into this revised version (XI/08). Errors of fact or interpretation are those of the principal author.

Budget

The APMC is largely a virtual center made up of faculty, staff, and stakeholders from multiple disciplines, schools, departments, and physical locations throughout the state. Only one faculty FTE and one classified staff FTE are dedicated to the operation and functions of the APMC. Dr. Al Fournier, IPM Program Manager and Adjunct Faculty in Entomology, oversees all the operations of the APMC including extensive communications, team organization, meeting logistics, program evaluation, and grant-writing (specific to APMC function). He also oversees the regional information network, the Arid Southwest IPM Network, that represents New Mexico, Nevada, Southern California and Arizona in all pest and pesticide information requests emanating from federal, regional, state, or stakeholder partners. Dr. Fournier's salary is based in state funds (20%), previously granted federal formula funds (30%), and competitive grants (50%). Dr. Fournier employs one Database Specialist, Senior, Mr. Richard Farmer, who is working with the state lead regulatory agency, the Arizona Department of Agriculture, in development of a pesticide use reporting database for research and outreach. Mr. Farmer is on a full-time, fixed term (1 yr), classified staff position through Maricopa Agricultural Center operating funds. Dr. Peter Ellsworth serves at the state IPM Coordinator and Director of the APMC. His state line is held by

entomology (51%) and the Maricopa Agricultural Center (49%). Thus, the total state investment consists of the 0.2 FTE (with ERE) invested in Dr. Fournier, estimated at \$18,000.

In the past, the APMC received and oversaw the federal allocation for IPM to Land-Grant institutions. The last three fiscal years this amount was: \$100,408/yr. The APMC invested a portion of this into Dr. Fournier's salary and the balance funded operational needs of the center and a mini-grant program. The latter awarded between \$40,000 and \$50,000 per year to UA faculty conducting IPM research and outreach.

These are all modest resources, but which have leveraged over \$4.8 million in extramural, competitive grants over the last 4 years! Budgetary requirements need to position the APMC for capturing a larger share of the infrastructural, competitive EIPM moneys that will come later this year. We expect to triple, at least, the amount of money from this program, i.e., to \$300,000 per year. This will require a show of significant and symbolic leverage of Dr. Fournier's salary. Thus, we will need to invest an additional 0.8 FTE in the Fournier line (with ERE) or: \$72,000.

Investment will also be necessary to develop academic excellence to accompany and synergize this APMC infrastructure, which is largely dedicated to translational research, implementation and outreach. These needs include recruitment of 4 IPM faculty FTEs: 2 academic (Research/Teaching) and 2 Extension positions (Research/Extension) in entomology and/or plant sciences. The estimated costs (with ERE) for these are: \$390,000 per year for faculty appointments plus classified staff (research specialists) support for 3 years at \$232,000 per year.

The other actions called for in this proposal are soft, in that they require no specific budgetary investment. Instead, institutional recognition and authority must be given to the APMC in order to steward the federal process of delivering IPM programs for the benefits of Arizona's citizens and importantly to successfully compete for these national Extension IPM funds, which will continue to be critical to our infrastructure. Having the APMC recognized at the institutional level will also facilitate development of trans-disciplinary research and outreach involving faculty across multiple colleges (e.g., Medical School).

Total Current State Investment: \$18,000 per year (0.2 FTE) exclusive of participating disciplinary faculty.

Requested Investment: \$694,000 per year for the first 3 years; \$462,000 per year thereafter (4 FTE).

Expected Federal Infrastructure Captured: > \$300,000 per year

Expected Increase in Competitiveness: > \$1 million per year in captured competitive grants.

Reference: APMC Brief to CALS Executive Council, http://cals.arizona.edu/apmc/docs/07EC_BriefUpdatevFlo.pdf

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