

# **The Agricultural Extension Team: Enhancing Stakeholder Input and Coordinated Program Planning and Delivery to Agricultural Clientele Statewide (an SPT project)**

## **2013 Grant Report**

### **Goals/Objectives**

(1) Through a variety of **stakeholder engagement** mechanisms, we will continue to identify research and information needs of agriculture clientele statewide.

(2) We will further **improve communication** between specialists and agents within Cooperative Extension to enhance program planning and delivery to meet clientele needs.

(3) We will provide quality up-to-date research-based **education and outreach** to stakeholders via Extension meetings and workshops, e-mail communications and publications.

### **Outputs, Outcomes and Impacts**

#### **1. Stakeholder Engagement**

##### **1a. Needs Assessment**

Identification of agricultural stakeholder research and education needs is a critical and ongoing part of extension program planning. A 2009-2010 Agronomic Crops IPM Needs Assessment determined priority research and education needs for field crops. Shawna Loper and Ayman Mostafa have conducted additional clientele needs assessments to help direct their future efforts and program planning. Working off of the 09-10 needs assessment, Shawna and Ayman continued to conduct survey using automated response system at meetings to update the results and assess current issues.

##### **1b. Crop Pest Losses Workshops**

Another form of stakeholder engagement occurs via the Crop Pest Losses and Impact Assessment Working Group. Through this activity, funded by the Western IPM Center, we annually engage pest control advisors working in cotton, lettuce and melons through a series of face to face workshops designed to develop data on crop yield losses due to pests and other factors and the economic impact of pests and pest management practices. In 2012 – 2013, we held 6 workshops (4 for cotton, one for melons and one for lettuce). Survey data are used to identify pest management research and education needs for our cotton and vegetable IPM programs. (See <http://cals.arizona.edu/apmc/croplosswg.html> for more information on this project and links to related ACIS pages, including survey data). These workshops also serve as a venue for two-way dialog with PCAs on important pest management issues.

##### **1c. Advisory Committees**

Another important source for stakeholder input for program planning is advisory committees. These exist at the state and county level, and some are project-specific. In addition to county advisory groups, we convene the IPM Coordinating Committee, a 22-member multidisciplinary stakeholder committee

that guides our IPM programs statewide. In addition to the IPM Coordinating Committee, an Agronomy Team was established to help address issues outside of IPM issues. These issues included, precision agriculture, nutrient management, water conservation, and the viability of new crops in Arizona. This team consists of members from Cooperative Extension, Natural Resources Conservation Service, USDA ARS, and other interested parties.

The 1080 database advisory group is made up of PCAs, growers, commercial applicators and ag---chemical industry representatives who provide input into the development of the Arizona Pest Management Center Pesticide Database, which includes 22 years of Arizona agricultural pesticide use data. These data have been useful for identification of pest management research and education needs and extension program planning, and also for generation of data for extension education outputs (presentations, reports and publications). The data have been used to provide input on federal pesticide information requests that have informed registration issues (see [http://ag.arizona.edu/apmc/Arid\\_SWPMC\\_Info\\_Requests.html](http://ag.arizona.edu/apmc/Arid_SWPMC_Info_Requests.html)).

## **2. Improve Communication within Cooperative Extension**

### **2a. Team Meetings**

The Extension Ag Team met twice this past year, once in Aug 2012 to plan late season Extension meetings and in again in Dec 2012 to plan Extension meetings. In addition, IPM Leadership Teams and other “Spin---Off” Groups have held their own meetings related to generating Extension outputs. Meeting notes are available on the APMC Integrated Crop Management Team webpage at [http://cals.arizona.edu/apmc/cotton\\_team/index.html#notes](http://cals.arizona.edu/apmc/cotton_team/index.html#notes) and on the Agronomic IPM Team webpage at [http://cals.arizona.edu/apmc/agronomic\\_ipm.html](http://cals.arizona.edu/apmc/agronomic_ipm.html).

## **2b. Team Email List**

Between meetings, the Ag Team maintains an email list to ensure ongoing communication and planning among team members.

## **2c. Team Websites**

The Arizona Pest Management Center websites hosts working group web pages (cited above) for the Integrated Crop Management Team, the Agronomic IPM Team and the Crop Pest Losses working group, all subsets of our Agricultural Extension Team. These web pages provide a point of contact for team members to post meeting notes and share current information and resources.

## **2d. Mentoring**

The existence and regular meetings of this group have facilitated mentoring of new and junior faculty members by tenured and senior faculty. This mentoring aspect has increased with the hiring of new county agents and assistants in extension.

## **3. Education and Outreach: Outputs, Outcomes and Impacts**

The Ag Team has sustained the momentum developed last year with the input and contributions of new faculty and has continued to leverage resources to maximize Extension outputs.

### **3a. Extension Meetings, Workshops and Field Days**

The Ag Team organized and delivered 33 extension meetings between 7/4/12 and 6/26/13, including Crop Pest Losses workshops, indoor meetings, "tent talks" and field-based meetings and demonstrations. In addition, several faculty (including Ellsworth, Fournier, Loper, Mostafa, Palumbo, Tickes, Nolte, Norton, Olsen and McCloskey) delivered presentations at state and regional conferences including the Desert Agriculture Conference and the Southwest Agriculture Summit.

The Southwest Ag Summit held in Yuma in March attracted 817 participants and delivered 13.5 AZ and 6.5 CA CEUs. Presenters for the Ag Team included Kurt Nolte, John Palumbo, Mary Olsen, Paul Brown, Peter Ellsworth, Mike Matheron, Barry Tickes, and Sam Wang.

### **3c. Advisories**

**Agent Advisories.** Agents in Pinal, Maricopa, Graham, Mojave, Cochise, LaPaz and Yuma Counties delivered of timely weekly crop and pest management advisories to over 800 email subscribers. Advisories are reaching all agricultural areas of the state once again. Advisories are reaching all agricultural areas of the state once again. All of these advisories draw upon the important work of specialists, including Paul Brown's weather advisory data and specific outputs of specialists described in the following section. Advisories have become increasingly diverse, and include meeting announcements, new publications, other sources of crop reports, relevant ag news, cotton weather advisories, links to videos and more.

**Vegetable IPM Updates.** In January 2010, with the coordination of Marco Peña, the Vegetable Crops IPM Leadership Team (Palumbo, Tickes, Matheron and Nolte) began putting out the Veg IPM Updates on a biweekly basis. These updates deliver timely information to end-users via web, email and smart phone. The team delivered 26 biweekly updates this funding period, each one with information on insect, disease and weed management topics. These reached over 450 Arizona and California

stakeholders by email list, and at least 300 stakeholders via the Arizona Crop Information Site (<http://ag.arizona.edu/crops/vegetables/advisories/advisories.html>). In addition, the same team has produced and posted dozens of vegetable IPM videos to date and created a video archive webpage at <http://ag.arizona.edu/crops/vegetables/videos.html>. Stakeholders have responded with enthusiasm about the quality and timeliness of these updates. We have seen a steady increase in attendance at educational meetings and a 2--fold increase in listserve membership for Veg IPM updates. Two regional agricultural publications, Western Farm Press and Western Agri--Radio Network further distribute these "updates" to much larger audiences throughout the West.

**Field Crops IPM Shorts.** The Field Crops IPM Leadership Team (Ellsworth, Ottman, Norton, McCloskey, Mostafa and Fournier), working with Assistant in Extension Lydia Brown, have followed the tradition of the Vegetable IPM Leadership Team in producing short, timely advisory pieces on field crops pest management and getting these out to the broadest audience possible. Starting in June 2011, they began producing "Field Crops IPM Shorts" on a weekly basis. Each "short" is a one---page article on a timely topic of interest that includes photos, data and/or graphics. Topics have included natural enemies of cotton pests, selective insecticides, cotton pest thresholds and sampling techniques, and a guide to glyphosate products for weed control. Some pieces have a broader crop management focus. The pieces go out to at least 360 stakeholders via agent email lists, and have also been picked up and redistributed by Western Farm Press while some pieces have been distributed by the National Cotton Council and Southwestern Farm Press, reaching many tens of thousands of readers. The pieces are archived on the ACIS site at [http://ag.arizona.edu/crops/cotton/agronomic\\_ipm.html](http://ag.arizona.edu/crops/cotton/agronomic_ipm.html). Since June 2011, we have produced 30 Field Crops IPM Shorts, plus an additional 11 translated into Spanish.

### **3d. Websites**

**Arizona Crop Information Website.** The ACIS website (<http://ag.arizona.edu/crops/>) hosts current information and publications for clientele on crop production and pest management and is a primary outlet for Extension outputs. The site also provides clientele with information about upcoming meetings and pesticide regulatory updates. Our ACIS email list includes about 300 participants, and is used to send updates to clientele on new extension publications, emerging pest or pesticide issues and upcoming events.

**Arizona Pest Management Center Website.** The APMC website hosts Team and Working Group pages that facilitate communication among Ag Team Members.

The Ag Team site: [http://cals.arizona.edu/apmc/cotton\\_team/index.html](http://cals.arizona.edu/apmc/cotton_team/index.html)

Agronomic IPM Leadership Team: [http://cals.arizona.edu/apmc/agronomic\\_ipm.html](http://cals.arizona.edu/apmc/agronomic_ipm.html)

Soil Fumigant Education Team: [http://cals.arizona.edu/apmc/soil\\_fumigant\\_education\\_team.html](http://cals.arizona.edu/apmc/soil_fumigant_education_team.html)

Crop Pest Losses Working Group: <http://cals.arizona.edu/apmc/croplosswg.html>

Cross---Commodity Research and Outreach Program (CROP): <http://cals.arizona.edu/apmc/cross---commodity.html>

### 3e. Publications

Below is a summary of new or revised articles and publications that represent outputs of this group. 26 Extension publications, 4 presentations, 5 abstracts, 10 media, and report. While the group has had more publications and outputs these are the ones that are easily accessible.

### Extension Publications

Ellsworth, P.C., L. Brown, Castro, G., S. Naranjo. 2012. In 7 Minutes or Less!. University of Arizona Cooperative Extension., 1p..

<http://cals.arizona.edu/apmc/docs/WhiteflySamplingShort.pdf>Spanish translation:

<http://cals.arizona.edu/apmc/docs/WhiteflySamplingSpanishvF.pdf>

Brown, L. & P.C. Ellsworth. 2012. *Drapetis*: Un Enemigo Natural. University of Arizona Cooperative Extension. 1p.. <http://ag.arizona.edu/crops/cotton/files/DrapetisvFspanishvF.pdf>

Mostafa, A., L. Brown, P.C. Ellsworth, V. Barlow & S. Naranjo. 2012. Desenredando la Telaraña... ¡Arañas en los Campos de Arizona!. University of Arizona Cooperative Extension., 1p..

<http://ag.arizona.edu/crops/cotton/files/SpidersWebsvFcSpanishvF.pdf>

Ellsworth, P.C., L. Brown, A. Fournier, X. Li, J. Palumbo & S. Naranjo. 2012. ¡Manteniendo Verde al Algodón!. University of Arizona Cooperative Extension. 1p..

<http://ag.arizona.edu/crops/cotton/files/SelectiveChemicalControlsvFSpanish.pdf>

Ellsworth, P.C., A. Mostafa, L. Brown & S. Naranjo. 2012. Collops de Cuerpo Blando . University of Arizona Cooperative Extension, 1p..

<http://ag.arizona.edu/crops/cotton/files/CollopsVFSpanish.pdf>

Ellsworth, P.C., L. Brown & S. Naranjo. 2012. To Stop or Not to Stop, That is the Question A Guide to Terminating Lygus Controls. University of Arizona Cooperative Extension., 1p..\_ <http://ag.arizona.edu/crops/cotton/files/LygusTerminationShortvF.pdf>Spanish translation: <http://ag.arizona.edu/crops/cotton/files/LygusTerminationShortvFSpanish.pdf>

Ellsworth, P.C., L. Brown & S. Naranjo. 2012. Being Selective!. University of Arizona Cooperative Extension., 1p..\_ <http://ag.arizona.edu/crops/cotton/files/KeyChemistryShortvF.pdf>Spanish translation: <http://ag.arizona.edu/crops/cotton/files/KeyChemistryShortvFSpanish.pdf>

Palumbo, J.C.. 2012. Insect Management on Desert Produce and Melons: Pests at Stand Establishment. University of Arizona Cooperative Extension.. Vol. 3 No. 15\_ [http://extension.arizona.edu/sites/extension.arizona.edu/files/resourcefile/resource/marcop/072512%20Pests%20at%20stand%20establishment\\_2012.pdf](http://extension.arizona.edu/sites/extension.arizona.edu/files/resourcefile/resource/marcop/072512%20Pests%20at%20stand%20establishment_2012.pdf)

McCloskey, W.B., A. Mostafa & P.C. Ellsworth. 2012. An Impending Disaster for Arizona Cotton? Glyphosate Resistant Palmer Amaranth. University of Arizona Cooperative Extension., 1p..\_ <http://ag.arizona.edu/crops/cotton/files/ResistantPalmerShort.pdf>

Ellsworth, P.C., L. Brown & S. Naranjo. 2012. ¡Seamos Selectivos!. University of Arizona Cooperative Extension. 1p..\_ <http://ag.arizona.edu/crops/cotton/files/KeyChemistryShortvFSpanish.pdf>

Ellsworth, P.C., L. Brown & S. Naranjo. 2012. ¿Aplicar o No Aplicar?, He Ahí el Dilema Guía para finalizar el control de Lygus.. University of Arizona Cooperative Extension. 1p..\_ <http://ag.arizona.edu/crops/cotton/files/LygusTerminationShortvFSpanish.pdf>

Ellsworth, P.C., L. Brown, Castro, G., S. Naranjo. 2012. ¡En 7 Minutos o Menos!. University of Arizona Cooperative Extension., 1p..\_ <http://cals.arizona.edu/apmc/docs/WhiteflySamplingSpanishvF.pdf>

C. Blake. 2012. Softer insecticides reduce pests in winter vegetables. Western Farm Press.\_ <http://westernfarmpress.com/vegetables/softer-insecticides-reduce-pests-winter-vegetables>

Stevens, B., D. Gouge, P. Baker, K. Umeda. 2012. Preventing and Treating Bed Bugs: What You Need to Know. University of Arizona Cooperative Extension.. Publication no. AZ1580, 2 pp..\_ <http://cals.arizona.edu/pubs/insects/az1580.pdf>

Gouge, D.H., U. Schuch, D. Kopec, P. Baker, K. Umeda & B. Stevens. 2012. Integrated PEST Management Works Inside and Outside School Buildings. University of Arizona Cooperative Extension. Publication no. AZ1579, 2 pp.. <http://cals.arizona.edu/pubs/insects/az1579.pdf>

Ellsworth, P.C., L. Brown & A. Mostafa. 2012. Under the Radar, Deep in the Canopy Brown Stink Bugs in Arizona Cotton. University of Arizona Cooperative Extension. 1 p..\_ <http://ag.arizona.edu/crops/cotton/files/BrownStinkBugShortvF.pdf>

McCloskey W. & L. Brown. 2013. Preplant and Preemergence Dinitroaniline Herbicides in Cotton. University of Arizona Cooperative Extension.

[http://cals.arizona.edu/crops/cotton/files/DNA\\_Herbicides.pdf](http://cals.arizona.edu/crops/cotton/files/DNA_Herbicides.pdf)

Brown, L., A. Mostafa, A. Fournier, & P. Ellsworth. 2013. Insect Pests of Desert-Grown Alfalfa: Alfalfa Aphid Complex. University of Arizona Cooperative Extension.

<http://cals.arizona.edu/crops/cotton/files/AlfalfaAphidDiagnostics.pdf>

J. Palumbo. 2013. Insecticide Modes of Action on Desert Produce and Melon Crops. University of Arizona Cooperative Extension. Vol. 4 No. 7, 1-3.

[https://extension.arizona.edu/sites/extension.arizona.edu/files/resourcefile/resource/marcop/040313%20IRAC%20MOA%20groups%20and%20Desert%20Crops\\_Apr%202013.pdf](https://extension.arizona.edu/sites/extension.arizona.edu/files/resourcefile/resource/marcop/040313%20IRAC%20MOA%20groups%20and%20Desert%20Crops_Apr%202013.pdf)

Lucy Li. 2013. IPM Mosquito Management – Fight the Bite. University of Arizona Cooperative Extension. <http://cals.arizona.edu/apmc/docs/2013MaySchoolIPMNewsletter.pdf>

Palumbo, J.C.. 2013. Impact of the Bagrada Bug on Desert Cole Crops from 2010 - 2012: A Survey of PCA and Growers. University of Arizona Cooperative Extension.. Vol. 4 No. 10, 8.

[https://extension.arizona.edu/sites/extension.arizona.edu/files/resourcefile/resource/marcop/052913%20Bagrada%20Bug%20Survey\\_2013\\_Report.pdf](https://extension.arizona.edu/sites/extension.arizona.edu/files/resourcefile/resource/marcop/052913%20Bagrada%20Bug%20Survey_2013_Report.pdf)

J. Palumbo. 2013. Knockdown and Residual Control of Bagrada Bug with Foliar Insecticides on Broccoli. University of Arizona Cooperative Extension.

<https://extension.arizona.edu/sites/extension.arizona.edu/files/resourcefile/resource/marcop/061213%20Bagrada%20Treatment%20matrix%202013.pdf>

J. Palumbo. 2013. Evaluation Of Conventional Insecticides For Control Of Bagrada Hilaris On Broccoli, 2012. University of Arizona Cooperative Extension.

[https://extension.arizona.edu/sites/extension.arizona.edu/files/resourcefile/resource/marcop/061213%20E\\_Palumbo\\_Broccoli\\_Bagrada%20bug%20efficacy\\_2012.pdf](https://extension.arizona.edu/sites/extension.arizona.edu/files/resourcefile/resource/marcop/061213%20E_Palumbo_Broccoli_Bagrada%20bug%20efficacy_2012.pdf)

Andrade-Sanchez, P., & J. T. Heun. 2013. Operation of Yield Monitors in Central Arizona: Grains and Cotton (2013). University of Arizona Cooperative Extension.

<http://cals.arizona.edu/pubs/crops/az1598.pdf>

Olsen M., R. Norton, M. McClure & L. Brown. 2013. Sampling Soil for Root Knot Nematode. University of Arizona Cooperative Extension.

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[https://extension.arizona.edu/sites/extension.arizona.edu/files/resourcefile/resource/marcop/062613%20Insect%20Management%20Whiteflies\\_2013.pdf](https://extension.arizona.edu/sites/extension.arizona.edu/files/resourcefile/resource/marcop/062613%20Insect%20Management%20Whiteflies_2013.pdf)

## Presentations

08/30/2012. Fournier A., P.C. Ellsworth, W. Dixon, P. Jepson, M. Guzy. Historical Pesticide Use in AZ Lettuce: Analyzing Risk. Yuma Ag Center, Yuma, AZ. 51 participants. 2 AZ CEU's, 2 CA CEU's.

03/06/2013. Jepson, P., M. Guzy, W. Dixon, Fournier, A., P.C. Ellsworth, J. Palumbo. Pesticide Use in Arizona Lettuce: Understanding and Reducing Risk. Southwest Ag Summit, Yuma, AZ. 100 participants. 1 AZ CEU, 1 CA CEU, 1 CCA CEU.

03/07/2013. Jepson, P., M. Guzy, W. Dixon, Fournier, A., P.C. Ellsworth, J. Palumbo. Lettuce IPM Workshop: Better IPM, Better Pesticides, Better Environment for Lettuce Production. Southwest Ag Summit, Yuma, AZ. 50 participants. 2 AZ CEU's, 2 CA CEU's, 2 CCA CEU.

03/07/2013. Ellsworth, P.C., Xianchun Li, Yves Carrière, Lydia Brown, & R.L. Nichols. Cotton Pest Management Research Update: Resistance & Resistance Management. Southwest Ag Summit, Yuma, AZ. 30 participants. .5 AZ CEU, .5 CA CEU, .5 CCA CEU.

## Abstracts

Ellsworth P., L. Brown, A. Fournier, W. Dixon. 2008. Measuring Up! Involving Stakeholders in Assessment of an Industry's IPM Revolution.

Ellsworth P., S.E. Naranjo, A. Fournier, L. Brown, W. Dixon. Successful Lygus Management as a Stabilizing Element of Cotton IPM in Arizona.

Ellsworth P., L. Brown, A. Fournier, W. Dixon. Measuring up! Involving stakeholders in assessment of an industry's IPM revolution.

Ellsworth P., P. B. Goodell, A. Fournier, L. Brown, D.L. Kerns, M.N. Parajulee. The Lygus Simulation Training Environment, An interactive workshop & discussion.

Brown L., P. Ellsworth, A. Fournier, W. McCloskey, W. Dixon. Measuring up! Involving Stakeholders in Assessment of an Industry's IPM Revolution.

## Media

M. Olsen, R. Norton, M. McClure and L. Brown. 2013. 6 steps to sample soil for root-knot nematodes, Western Farm Press. [http://westernfarmpress.com/cotton/6-steps-sample-soil-root-knot-nematodes?NL=WFP-01&Issue=WFP-01\\_20130627\\_WFP-01\\_518&YM\\_RID=peterell@ag.arizona.edu&YM\\_MID=1405171&sfvc4enews=42](http://westernfarmpress.com/cotton/6-steps-sample-soil-root-knot-nematodes?NL=WFP-01&Issue=WFP-01_20130627_WFP-01_518&YM_RID=peterell@ag.arizona.edu&YM_MID=1405171&sfvc4enews=42)

Fournier, A. & S. Elliot. 2013. Arizona's Vegetable IPM Updates., Western IPM Center blog. <http://www.ipmwest.blogspot.com/>

C. Blake. 2013. Glyphosate resistance changes Arizona cotton industry., Western Farm Press Daily. <http://westernfarmpress.com/cotton/glyphosate-resistance-changes-arizona-cotton-industry?page=3>

C. Blake. 2012. Softer insecticides reduce pests in winter vegetables, Western Farm Press. <http://southwestfarmpress.com/vegetables/softer-insecticides-reduce-pests-winter-vegetables>

William McCloskey, Ayman Mostafa, and Peter Ellsworth. 2012. Glyphosate-resistant Palmer amaranth suspected in Arizona cotton, Western Farm Press Daily.

[http://westernfarmpress.com/cotton/glyphosate-resistant-palmer-amaranth-suspected-arizona-cotton?NL=WFP-01&Issue=WFP-01\\_20120731\\_WFP-01\\_788&YM\\_RID=`email`&YM\\_MID=`mmid`](http://westernfarmpress.com/cotton/glyphosate-resistant-palmer-amaranth-suspected-arizona-cotton?NL=WFP-01&Issue=WFP-01_20120731_WFP-01_788&YM_RID=`email`&YM_MID=`mmid`)

Mostafa, A., R. Norton. 2012. Basic Structure of a Cotton Plant, University of Arizona Cooperative Extension. [http://cals.arizona.edu/crops/cotton/agronomic\\_videos.html](http://cals.arizona.edu/crops/cotton/agronomic_videos.html) YouTube link:

<http://www.youtube.com/watch?v=-a97XF5sNos>

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[http://cals.arizona.edu/crops/cotton/agronomic\\_videos.html](http://cals.arizona.edu/crops/cotton/agronomic_videos.html) YouTube link:

<http://www.youtube.com/watch?v=8fEDTh4bErQ>

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[http://cals.arizona.edu/crops/cotton/agronomic\\_videos.html](http://cals.arizona.edu/crops/cotton/agronomic_videos.html) YouTube link:

<http://www.youtube.com/watch?v=1YPyl8rx6KM>

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<http://www.youtube.com/watch?v=o18BSSpl9KQ>

Fitzenberger, J.. 2012. Award to UA, Others Marks Morrill Act 150th Anniversary, University of Arizona, UA News. <http://uanews.org/node/47978>

## Reports

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