



Arizona Department of Agriculture

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**Specialty Crop Block Grant Program
Agreement No. 12-25-B-1213**

**1st Annual Performance Report
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Introduction

On October 3, 2011, the Arizona Department of Agriculture (ADA) entered into a cooperative agreement with the United States Department of Agriculture (USDA), Agricultural Marketing Service (AMS) in the amount of \$1,172,102.32 in FY11 Specialty Crop Block Grant Program – Farm Bill funds to fund sixteen projects specifically designed to increase the consumption and enhance the competitiveness of Arizona Specialty Crops. Projects within the Arizona State Plan include two marketing projects, six education projects and ten research projects and are one to three years in duration. The expiration of the grant period is September 29, 2014.

2012 SWAS – An Interactive Educational Experience

This project was completed on September 30, 2012

Project Summary

Considerable information exists that would benefit specialty crop producers if that information was available and understandable. The 2012 Southwest Ag Summit was designed to provide an interactive forum in which educators, researchers, farmers, students and agriculture industry specialists come together to discuss and gain insights into new and emerging technologies in specialty crop production. The 2012 Southwest Ag Summit focused on the goals of increasing participation and expanding the Ag Summit's reach by promoting greater use of its website and urging participants to share materials with colleagues unable to attend the Ag Summit.

Project Approach

The Southwest Ag Summit has become an industry-specific leader in the desert southwest due to a close collaboration between the University of Arizona, the Yuma County Farm Bureau and the Yuma Fresh Vegetable Association. During this two-day event hundreds of members of the specialty crop industry participated in educational programs specially designed to provide timely and specific information. The forum and meeting materials enhanced opportunities for members of the specialty crop industry to better compete in an expanding global marketplace. In addition, all participants were encouraged to share the information they were provided with colleagues who did not attend the conference.

Held March 7th and 8th, 2012, the Southwest Ag Summit was planned and administered by a Steering Committee comprised of members of the specialty crop industry. The 2012 committee was led by Bruce Gwynn, a local chemical representative, Dr. Kurt Nolte, University of Arizona, Yuma County Cooperative Extension Service Director, and Steve Alameda, a local specialty crop grower. Details – from initial planning of the event through evaluation and final report – were overseen by the Ag Summit Coordinator.

Field Demonstrations

During the 2012 Southwest Ag Summit, the variety of field demonstrations was expanded. Dr. Kurt Nolte, Dr. John Palumbo and Dr. Mark Siemens of the University of Arizona Yuma Ag Center amassed a comprehensive program of innovative, state-of-the-art exhibits. Before developing the program, the planners used information collected by querying specialty crop growers.

The 2012 Southwest Ag Summit Field Demonstrations provided displays and presentations on various topics, including new technologies in site-specific management, crop protection, the latest in crop variety selection, novel irrigation and water delivery approaches as well as new land leveling and tillage equipment. Agricultural companies wishing to be involved in the Field Demonstrations registered as early as a year in advance. It is estimated that two hundred members of the agriculture industry were in attendance.

Academic General Sessions and Workshops

A keynote address was delivered on the second morning of the Southwest Ag Summit. Mr. Mike McCarty, CEO of Helena Chemical Company, delivered an address entitled “Pest Management Technologies Have a Bright Agricultural Future” to an audience of approximately six hundred members.

Eleven educational workshops about specialty crop topics were included in this year’s program during morning and afternoon sessions. The speakers, who came from all across the country, presented information and answered participants’ questions.

Specialty crop programs included:

- Integrated Pest Management Regulatory Update
- Fresh Produce Safety I and II
- Minimizing Pest Spray Drift and Advanced Nozzle Selection
- Alternative Crops and Technologies
- Fresh Approaches to Plant Nutrition and Fertilizers
- Integrated Pest management in Vegetables
- Agribusiness, Strategic Planning for the Future
- Crop and Irrigation Management
- Agricultural Labor and Immigration Reform

In 2012, the educational program expanded with an additional keynote speaker during lunch. In an interview-type setting, Max Armstrong, Programming Director for Farm Progress spoke informally with Howard G. Buffett, CEO of The Howard G. Buffett Foundation on many current topics, including agricultural labor, water resources and food production for the world’s population. Well over five hundred people were in attendance to hear the discussion of these critical topics.

A new workshop involved a panel discussion about agricultural labor and immigration reform entitled “Trends in the Agricultural Labor Market: Interactive Panel Discussion.” Because specialty crop production is labor intensive, specialty crop producers were very interested in the discussion. The panel included two distinguished experts from Washington, DC: Monte Lake, an immigration attorney, and Tamar Jacoby, President of Immigration Works USA.

A listing of all field demonstrations, speakers, and educational session topics is included in the schedule of events for the Southwest Ag Summit. A copy is attached and marked as **Appendix A**.

Southwest Ag Summit Logistics

Outreach and logistics were vital in ensuring a seamless program. New and different outreach approaches were tried along with proven methods. The Yuma Visitors' Bureau staff produced the popular and effective *Ag Summit Insider* as a part of their marketing campaign and distributed it to 5,000 agricultural leaders in Arizona, California, Nevada and New Mexico. This eight-page publication, entitled, "Faces of the Industry," showcased the Yuma specialty crop industry by providing insights from a variety of local agricultural leaders. Event schedules and speaker information were included as well.

Goals and Outcomes Achieved

The Steering Committee was pleased with the outcome of the 2012 Southwest Ag Summit and it believes four goals were successfully achieved.

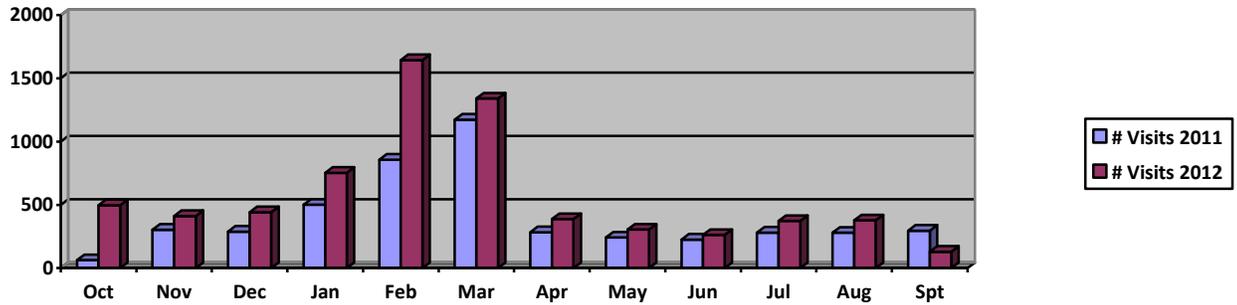
1. As a part of our aggressive outreach campaign, prospective participants were notified of the upcoming 2012 Southwest Ag Summit using a variety of media including email blasts. Attendees were then registered for the 2012 Southwest Ag Summit via telephone, mail and the internet. Approximately 670 people from the vegetable and melon industries registered and attended the 2012 Southwest Ag Summit educational programs. The actual participation in the Southwest Ag Summit was 35% over our original target of 495, and greatly surpassed our expectations.
2. 2012 Field Demonstrations attracted approximately 200 attendees from the specialty crops industry, only slightly higher than our target attendance of 192, but an increase of fifteen percent over our benchmark figure of 175.
3. The Southwest Ag Summit website had been upgraded the previous year so that the Steering Committee could track its use by potential Southwest Ag Summit participants and gauge how important it was in disseminating information to specialty crop industry personnel. The information derived from website statistics shows that our website, www.swagsummit.com, continues to be invaluable in expanding the reach of the Southwest Ag Summit to potential specialty crop industry participants.

By comparing data from the last two years, the value of the Southwest Ag Summit website, www.swagsummit.com, becomes more apparent.

The number of visits to the Southwest Ag Summit website:

- October 2010 – September 2011 (2011 Ag Summit) ranged from a monthly low of 64 to a high of 1,173 with an annual total of 5,450 visits.
- October 2011 – September 2012 (2012 Ag Summit) ranged from a monthly low of 130 to a high of 1,644 with an annual total of 6,925 visits.

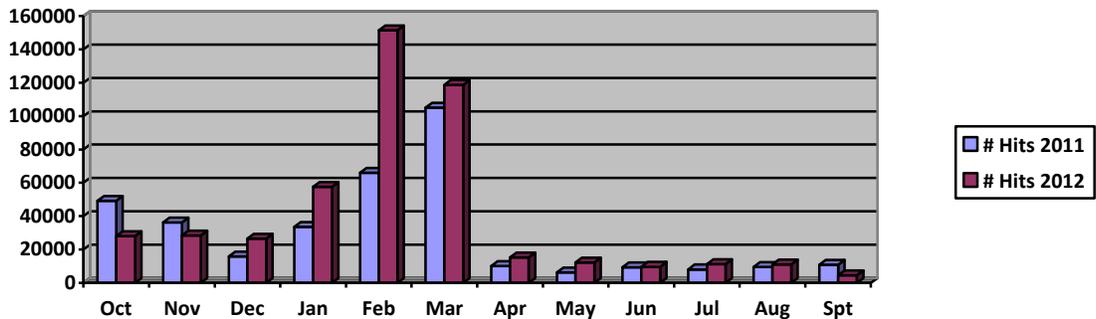
This is an increase of 27% from 2010-2011, the first year tracking visits.



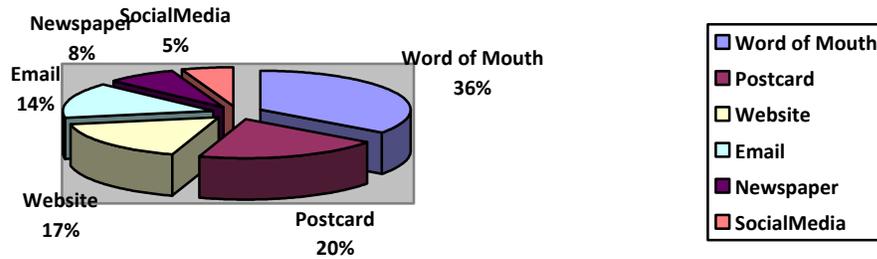
The number of hits on the Southwest Ag Summit website:

- October 2010 – September 2011 (2011 Ag Summit) ranged from a monthly low of 6,324 to a high of 105,092 with an annual total of 451,920 hits.
- October 2011 – September 2012 (2012 Ag Summit) ranged from a monthly low of 4,563 to a high of 151,390 with an annual total of 816,051 hits.

This is an impressive increase of 80% from 2010-2011, the first year of tracking hits.



4. As previously mentioned, prospective attendees were notified of the 2012 Southwest Ag Summit in various ways. Using the data from the survey it was determined that, while some methods were more effective than others, all methods used to publicize the upcoming event were useful.



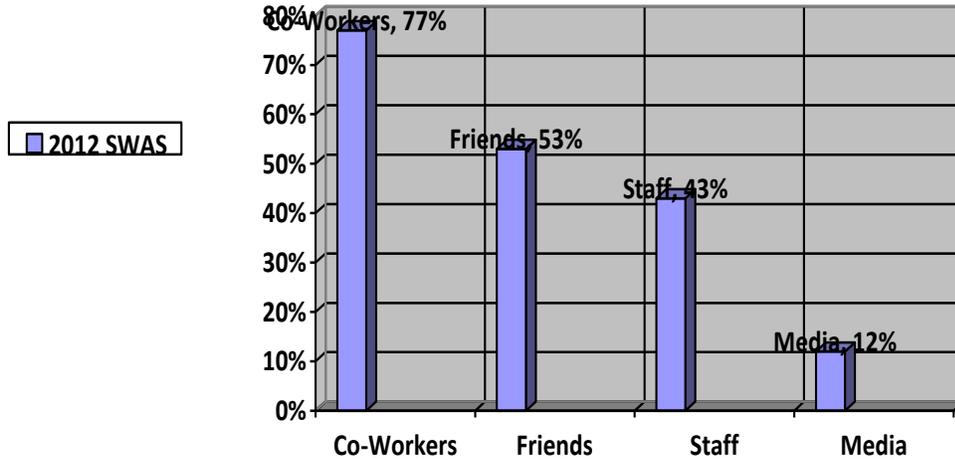
Beneficiaries

A survey was distributed to Southwest Ag Summit participants on the final day of the event to gauge how well the Southwest Ag Summit was meeting the needs of the specialty crop industry. These completed surveys provided feedback about the Ag Summit's direct and indirect impact. A copy of the exit survey is attached and marked as **Appendix B**. This survey demonstrated to the Steering Committee the diversity of participants as well as their varied interests at the Southwest Ag Summit.

Of those completing the 2012 Southwest Ag Summit survey, 45% indicated that they had attended the field demonstrations.

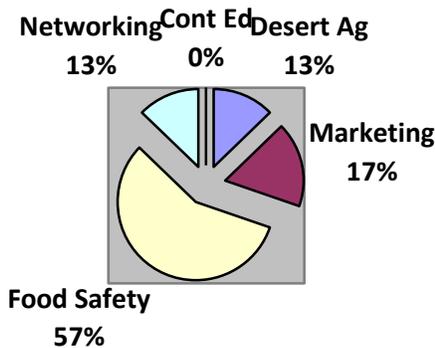
A specific goal this year was to increase the number of people who received information from the 2012 Southwest Ag Summit even though they did not attend the Ag Summit. Surveys completed by participants indicated they would share the information they obtained from the Southwest Ag Summit with many others, thus expanding the reach of our target audience of Arizona, New Mexico, Nevada, California and Northern Mexico. Information obtained at the Southwest Ag Summit will be shared with (includes multiple overlapping answers):

- Coworkers – 77%
- Friends and family – 53%
- Staff – 43%
- The media – 12%



The Southwest Ag Summit helped those who attended by:

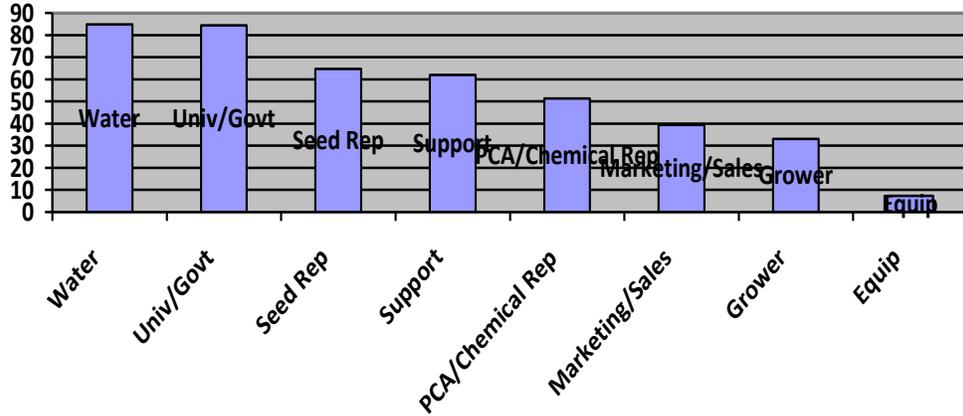
- Obtained Material About Food Safety – 57%
- Providing marketing opportunities – 17%
- Developing networking opportunities – 13%
- Obtaining material about desert agriculture – 13%
- Gaining Continuing Education Credits - < 1%



With attendance figures 35% higher than the previous year, those who completed the exit survey indicated our participants were:

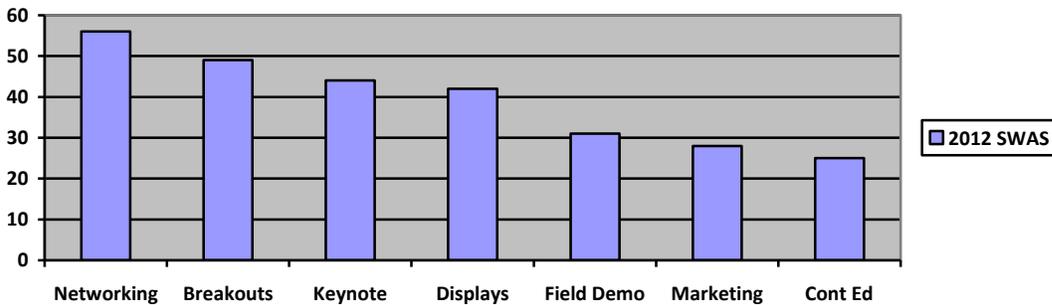
- University/government related personnel – 20%
- Water related personnel – 19%
- Professional/support personnel - 15%
- Seed related personnel – 15%
- PCAs and chemical related personnel – 12%
- Marketing/sales representatives – 9%

- Specialty crop producers – 8%
- Equipment dealers



Attendees from all occupations who responded also indicated the reasons for attending their Southwest Ag Summit (includes multiple overlapping answers):

- Networking opportunities – 56%
- Academic breakout sessions – 49%
- Keynote address – 44%
- Booth displays – 42%
- Field demonstration – 31%
- Marketing opportunities – 28%
- Continuing education credits – 25%



The economic impact of the 2012 Southwest Ag Summit on specialty crop producers and associated industry members of the desert southwest region of Arizona is extraordinary. The USDA 2007 Census of Agriculture, National Agricultural Statistics Service website lists Yuma County as having a market value of \$673,544,000 for the category of “vegetables, melons, potatoes and sweet potatoes.” For 2007, the market value of Yuma County vegetables and melons was higher than any other agricultural commodity produced throughout the State of Arizona. In addition, Yuma County ranked 3rd out of 3,079 counties in the United States for value of sales for vegetables and melons. Yuma County vegetable and melon production is not

only economically significant to Arizona, but it is virtually unparalleled throughout the United States.

Lessons Learned

Overall, the Steering Committee and the participants deemed the 2012 Southwest Ag Summit an outstanding success. New and pertinent information was disseminated to members of the specialty crop industry by experts in their fields and that information was shared with others who did not attend the Ag Summit. In its evaluation of the 2012 Southwest Ag Summit, Steering Committee members determined a number of “Lessons Learned.”

1. The 2012 Field Demonstrations attracted approximately 200 attendees from the specialty crop industry. This figure is slightly higher than our target attendance of 192 and an increase of 15% over our benchmark of 175. However, the Steering Committee decided that the Field Demonstration was not attracting the number of participants that it would like. In addition, unfavorable weather conditions on the day of the Field Demonstration are always a factor. This year if the event had been held one day later, it would not have occurred due to high wind and cooler than normal temperatures. In 2010, the Field Demonstration was cancelled due to rain. As a result, the Steering Committee has concluded that it will not hold the Field Demonstration in 2013, but instead it will focus on educational workshops for members of the specialty crop industry.
2. The venue for the 2012 Southwest Ag Summit was chosen because of its proximity to other agricultural events. However, participants complained about the lack of parking and available space in some of the venue rooms. Problems were also encountered with the venue’s sound system and other necessary equipment. The Steering Committee determined that a change of venue is appropriate for the 2013 Southwest Ag Summit.
3. As the Steering Committee looks to the future of the specialty crop industry, it attempts to find new ways to include more college students. For the 2013 Southwest Ag Summit, the Steering Committee has contracted with the local community college, Arizona Western College, to provide services that will involve more students enrolled in agricultural programs.
4. Consistent information about the event is essential. When information is listed in emails, postcards, forms and on the Southwest Ag Summit website, it must be reliable. To ensure consistent information for the 2013 Southwest Ag Summit, one person will be responsible for reviewing the information before it is disseminated.
5. The Steering Committee has concluded that early deadlines are essential to those responsible for providing marketing information and program materials in order to minimize last minute problems.
6. In order to reach as many potential participants as possible, the Steering Committee has obtained contact lists from various organizations. These various lists often contain names of the same people. Efforts to remove duplicate names from the contact lists will continue so that people will not receive multiple identical materials.
7. The 2012 Southwest Ag Summit marketing strategy encompassed a number of different approaches. One strategy relating to email blasts seemed to produce significant results and increase registration numbers. There will be a greater emphasis on email blasts for the next Ag Summit.

The value of the Southwest Ag Summit increases each year as the Steering Committee endeavors to ensure the next Southwest Ag Summit builds on strengths and reduces or eliminates problems. The Steering Committee and staff are currently preparing for the 2013 Ag Summit, scheduled for March 6-7, 2013.

Contact Persons

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Additional Information

The educational programs provided at the Southwest Ag Summit evolve each year. While some of the topics remain the same, the information provided is always fresh and relevant to current agricultural needs. In order to enhance the competitiveness of the Arizona specialty crop industry, new and different programs are added every year. Each program is specifically designed to enhance the knowledge imparted to the specialty crop participants with the end goal of strengthening their place in the global market and increasing consumption of the vegetables and melons grown in the desert southwest.

Arizona Gardens for Learning

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- Met with Arizona Department of Health, Hope Wilson, on October 28, 2011 to begin resource collection.
- Was notified in December 2011 that Hope Wilson was leaving ADHS.
- We are continuing to source partners and resources

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- Planting guide partner, Stacey Bealmear, was selected in February. Originally she thought she could complete by 3/31/12, but asked for a little more time. This did not affect the overall schedule, so we agreed to a May 15, 2012 due date
- Have compiled Yuma school list and sourced contacts in the Yuma area to potentially help with school profiles and photos
- Secured at least one contractor in Tucson

Third Quarter (Apr. 2012 – June 2012) Activities:

- Planting guide is complete and with the editor who is working on editing and updating the design of the book to be more Arizona specific
- Continuing to review database of school gardens and outreach to schools for potential profiles. This has been a little slow as school year was winding down. Will revisit when schools are back in session

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- Continued to source schools to highlight and sub contractors to cover Spotlights. Meet with schools in Yuma; lining up schools in Phoenix and Tucson.
- Book editing in progress

Problems and Delays

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- We are on schedule.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- Our planting guide was due March 31, 2012. Stacey Bealmear, of University of Arizona, asked for additional time and is finishing it up. It will be ready by May 15, 2012. This delay in the planting guide will not affect the overall project timeline.

Third Quarter (Apr. 2012 – June 2012) Activities:

- We are on schedule

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- We are on schedule

Future Project Plans

- Continue to source subcontractors and promo partners
- Continue school selection
- Continue to work with book editor/designer on updating book

Funding Expended To Date

A total of \$4,594.00 had been expended as of September 30, 2012.

Implementation of GHP/GAP On-Line Certification Training Program

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- An Instructional Specialist (Ms. Laura Nerad) was hired on 15 October
- The existing Arizona GAP training program, developed during execution of the SCBGP FB10-39 award, was adapted to create an online version that would meet commercial producers and direct marketers
- A GAP/GHP training website has been created

- The online GHP/GAP training modules are currently being developed
- The overall training program was evaluated by ADA personnel on December 21, 2011 and a progress report made.
 - Supplies purchased: None.
 - In-state travel: None.
- While the web-based training curriculum is being developed, in-class GHP/GAP workshops are being conducted:
 - Willcox (10/25 – 10/26), 19 attendees

Second Quarter (Jan. 2012 – Mar. 2012) Activities

- Work continues on writing and completing voiceovers, photos, and video for the online training modules.
- A Spanish translator was identified and has been working on translating the slide sets and voiceover dialog into Spanish.
- While the web-based training curriculum is being developed, concurrent in-class GHP/GAP workshops are being conducted:
 - Buckeye (1/12 – 1/13), 24 attendees
 - Casa Grande (3/27 – 3/28), 5 attendees

Third Quarter (Apr. 2012 – June 2012) Activities

- Completion is nearing on the on-line version of the GHP/GAP training program. Spanish translation is on-going.
- While the web-based training curriculum is being developed, concurrent in-class GHP/GAP workshops are being conducted:
 - Phoenix (4/24 – 4/26), 30 attendees
 - Tucson (5/29 – 5/30), 19 attendees

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- Essentially, the online GHP/GAP training program is complete. All scripts have been written, and voiceovers created. The online training program is available at <http://cals.arizona.edu/fps/GHP-Online>. Some additional fine tuning of the website will be done as it is found to be necessary.
- While the online training program was being completed, additional live GHP/GAP workshops were being conducted.
 - Bullhead City: (7/11/12 – 7/12/12), 14 attendees.
 - Flagstaff, (8/8 – 8/9/2012), cancelled
 - Nogales (9/5/2012), 22 attendees.

Problems and Delays

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- Everything appears to be on target.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- We are on target for an early summer completion date.

Third Quarter (Apr. 2012 – June 2012) Activities:

- A slight delay in Spanish translation has crept in unexpectedly. The original translator that was identified in the second quarter decided to leave the area. Another translator has been identified.

Fourth Quarter (July 2012 – September 2012) Activities:

- A Spanish translator was identified; the GHP/GAP program has been translated into Spanish.

Future Project Plans

Despite reaching the end of the project, the PI will continue to update the dedicated online training website, and provide additional information such as video content, quizzes, and other information when warranted.

Funding Expended To Date

A total of \$26,742.94 had been expended as of September 30, 2012.

Continuation of GHP/GAP Certification Cost-Share Program

Activities Performed

GHP/GAP Cost Share Reimbursements are currently being processed and paid under the SCBGP-FB2010 agreement. Reimbursements under this agreement will commence when the other funding has been expended.

SCBGP staff reviewed the USDA audit program website to find producers who had completed a GAP /GHP audit. Letters were then sent to those producers on this list that had not previously applied for cost share reimbursement. The letters informed these companies of their eligibility to receive 75% but to a maximum of \$750 of the total cost of their audit.

The GHP/GAP Coordinator and GHP/GAP Trainer continue to promote the program through their one-on-one assistance, online and workshop training programs.

Problems and Delays

GHP/GAP Cost Share Reimbursement Applications have been slower than anticipated. As stated in this annual report under the GHP/GAP Certification One-On-One Assistance Program there has been an increase in interest in the GHP/GAP programs. We foresee this interest as being beneficial to the increase in cost share applicants. SCBGP staff will continue to cross reference the USDA audit program website and send letters to potential cost-share applicants.

Future Project Plans

Applications will be processed when SCBGP-FB2010 funds have been expended.

Funding Expended To Date

There have been no funds expended to date.

GHP/GAP Certification One-on-One Assistance Program

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- The Food Safety Projects Coordinator (FSPC) attended 1GAP/GHP training program conducted by Dr. Kurt Nolte, University of Arizona Extension office, Yuma, AZ. This was held in Willcox, AZ, October 25-26, 2011 attended by 20 producers and processors.
- The FSPC attended several “Meet and Greets” to extend outreach to the farming and gardening communities. These included: The Arizona Farm Bureau Meeting on November 10, 2011, in Phoenix, AZ. This meeting was the Maricopa County Farm Bureau’s annual convention to discuss upcoming legislation, elect new leaders, and to discuss the year’s occurrences. On December 1, 2011 the FSPC attended the Yuma Fresh Produce annual meeting in Yuma, AZ to again extend outreach to the farming community. Approximately 60 local producers attended.
- On November 21, 2011 the FSPC made a presentation to the Arizona Department of Health Services introducing the GHP/GAP program and the ADA/U of A roles and responsibilities of this program. The approximately 60 attendees of this presentation were inspectors of each of Arizona’s county environmental services/health departments.
- The FSPC had a conference with one producer on November 16, 2011 to assist in developing a food safety plan and food safety program.
- The FSPC has made phone contacts at least one time to all the participants of all the GHP/GAP training sessions to offer assistance in the development of a food safety plan or program for each participant.
- There have been approximately 50 face to face and phone contacts with prospective producers that were not attendees of the GHP/GAP training sessions.
- The significant contributions of this program are from The University of Arizona’s Extension Service’ Dr. Kurt Nolte, Yuma, AZ and ADA’s ACT. While ACT has hired the FSPC and funded the program, made available the cost share program, the contributions Dr. Nolte and staff have made to this program include the development of training materials and the distribution of these training materials to attendees. U of A has also developed an on-line training in order for a wider audience to participate where producers and processors cannot attend a two-day training. ACT and the U of A have collaborated on the materials presented at the training sessions.
- This being a new program with no baseline data will have to be re-evaluated at a later date.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- The Food Safety Projects Coordinator (FSPC) attended and assisted with 3 GAP/GHP training programs conducted by Dr. Kurt Nolte, University of Arizona Extension Office, Yuma, AZ. These were held in: Phoenix, January 12-13, 2012, 25 attending; March 15, Yuma, AZ, 6 attending; Casa Grande, AZ, March 27, 7 attending.
- The FSPC had a follow up conference with two producers to assist in developing a food safety plan and food safety program hopefully leading to the successful passing of the GHP/GAP audit.

- The FSPC has made phone contacts at least one time to all the participants of all the GHP/GAP training sessions to offer assistance in the development of a food safety plan or program for each participant.
- There have been approximately 50 face to face and phone contacts with prospective producers that were not attendees of the GHP/GAP training sessions.
- The FSPC attended two Farm to School meetings, attended by representatives from AZ Department of Education, AZ Department of Health Services, University of Arizona, Extension Service, and local school districts. The objectives are to include locally grown produce into the schools. An additional topic arising is the school garden. The AZ Department of Education and AZ Department of Health Services developed guidelines for the schools desiring to have a garden located on the school campus, attended by the students, and the produce destined for the cafeteria or for the students' meals.
- The FSPC attended a Legislative Ag Fest in January, at the AZ Department of Agriculture building, Phoenix, attended by the AZ legislature and Arizona agriculture industry. The purpose of this is to re-introduce the AZ legislatures to the agriculture community.
- The FSPC attended Energy Audit Training hosted by Ensava, an Energy auditing processing business in Vermont. The AZ Governor's Office, the United Dairyman's Association, and the AZ Department of Agriculture ACT team were represented. Along with several members from the ACT team the FSPC became a certified energy information collector, capable of verifying the information on selected dairy farms' energy use. The information collected would be returned to Ensava for verification purposes and analysis.
- The FSPC attended a meeting of the Directors of County Health Departments to discuss the GHP/GAP program.
- The FSPC attended the AG SUMMIT in Yuma, AZ, along with several of the ACT team. This exposition is for the agricultural community to interact with others, to listen to presentations from groups, including the AZ Farm Bureau, legislators, and other interested parties, and to discuss products from vendors. The ACT team attended to discuss each individual's program.

Third Quarter (Apr. 2012 – June 2012) Activities:

- The Food Safety Projects Coordinator (FSPC) attended and assisted with 2 GAP/GHP training programs conducted by Dr. Kurt Nolte, University of Arizona Cooperative Extension Service, Yuma, AZ.
- These were held in:
 - Phoenix, April 25-26, 2012, 25 attending;
 - Tucson, May 29-30, 2012, 22 attending;
- The FSPC attended the Beginning Farmers annual conference hosted by the Maricopa County Extension office of the U of A Cooperative Extension Service and made a presentation on the GHP/GAP program. The Beginning Farmers Program is designed to instruct new growers, or advanced growers into marketing their products. It was reported that 50 people attended, including many producers, farmer's markets managers, industry representatives and the AZ Farm Bureau.

- The FSPC accompanied ADA Director Donald Butler and attended the Agribusiness Council of Arizona at the Phoenix Zoo on May 18, 2012. The topic discussed was water, critical to the west.
- The FSPC attended 2 Farm City Partnership breakfasts with other members of the ACT Team. One on April 3, 2012 was held in Gilbert and the second was held April 24 in Mesa.
- The FSPC assisted in two one to one meetings with producers to develop a food safety program leading to a GHP/GAP audit. One was in Phoenix on April 10 with a hydroponic grower of micro-greens. Unfortunately, micro-greens are not applicable into the GHP/GAP program. The second was a potato grower in Litchfield, AZ on April 12 and a return on April 24. This grower has successfully passed the audits for several components of the GHP/GAP program.
- The FSPC has made phone contacts at least one time to all the participants of all the GHP/GAP training sessions to offer assistance in the development of a food safety plan or program for each participant. Messages were left to those unanswered calls.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- The Food Safety Projects Coordinator (FSPC) attended and assisted with 2 GAP/GHP training programs conducted by Dr. Kurt Nolte, University of Arizona Cooperative Extension Service, Yuma, AZ.
- These were held in:
 - Kingman, July 11-12, 2012, 25 attending;
 - Flagstaff August 8-9 training was cancelled due to lack of industry support
 - Nogales, September 5, 2012, 24 attending;
- The FSPC assisted in three one-to-one meetings with producers to assist in developing a food safety program leading to a GHP/GAP audit.
 - Flagstaff, July 6, assisted two partners with a food safety program who are developing a greenhouse and growing greens.
 - Tucson, August 16, assisted one grower in greenhouse growing lettuce
 - Phoenix, September 12 met with one farmer to discuss the GHP/GAP program and to initiate a training class in Phoenix for him and his growers.
- The FSPC attended a meeting of the Farm to School committee on August 20.
- The FSPC attended the Maricopa County Farm Bureau annual meeting with other members of the ACT Team on August 30.
- Dr. Nolte, Karen Edwards, and the FSPC toured a produce distributing warehouse in Rio Rico, AZ on September 6, 2012. Although the visit was mid-season and the warehouse was empty of produce, we were able to walk through the warehouse and received an explanation of their activities.
- The FSPC attended a meeting on School Gardens with Monica Pastor and Dr. Kurt Nolte on September 25 in Maricopa, AZ.
- The FSPC has made phone contacts at least one time to all the participants of all the GHP/GAP training sessions to offer assistance in the development of a food safety plan or program for each participant. Messages were left to those unanswered calls
-

Problems and Delays

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- The goals of face to face development of food safety plans and programs for each individual producer, as established, fell short of the actual accomplishments due to the uncertainty and newness of the GHP/GAP program, and as discussed below. With all good intentions, these are still achievable. These goals will not be re-evaluated until a later date. But the goals of hiring a FSPC; partnering with the U of A and development of training materials and the presentation of these training materials to the producing and processing industry have not failed, rather have exceeded expectations.
- We anticipated more producers, processors and packers to take advantage of this program after attending the free training by Dr. Nolte, especially a one on one session with an employee trained in food safety programs and HACCP (Hazard Analysis Critical Control Point). After staff discussions, it is a possibility that producers, processors, and packers have distrust for the Department of Agriculture. This may stem from an aversion to state government or prior enforcement from the department. The Agricultural Consultation and Training (ACT) Division of ADA is the sole division in the department not immersed in enforcement. But the producing public may be unaware of ACT's intentions. Several ACT programs have been readily accepted by other agricultural businesses, e.g. pesticide instructional seminars, dust control and waste water control meetings. In our opinion: this will take time and consistent effort to convince the producers of ACT's agenda.
- Another incentive to producers to begin this program, which has gone largely unrealized, is the cost share program. Upon successful completion of an audit, by USDA, ADA or a third party auditor, the producer is able to apply for and receive up to seventy-five (75) % of the cost of the audit. No one has taken advantage of this plan this quarter.
- During each training session presented by Dr. Nolte, ACT's FSPC is involved with the instruction with examples of enforcement and auditing. He clearly and several times during these sessions indicates that there is no enforcement involved with GHP/GAP training or having the FSPC for an onsite visit. This is a voluntary program at this time. These ideas are repeated several times during the two day sessions
- The target of this project has not been reached. These targets, as defined, are realistic. Once the producing public realizes the ACT agenda of consultation and training are not about enforcement there will be an increase in the program. Being a voluntary program it is easier to work and achieve success. If and when a certification is required to sell produce, the producing and processing public will quickly accept ACT's offer for consultations.
- ACT would like to see 100% participation by producers and processors in this program, to insure safe food is produced and processed in our state.
- The current performance goals will remain unchanged for the next quarter. No changes are planned for the next quarter.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- No changes from first quarter.

Third Quarter (Apr. 2012 – June 2012) Activities:

- No changes from first quarter.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- There has been an increase in interest in the GHP/GAP program as evidenced by the increased number of calls and emailed questions. The attendance of the training classes is also increasing as are the one on one consultations.

Future Project Plans

- The FSPC is working with the University of Arizona's College of Agriculture and Life Science's Cooperative Extension Service to assist in the training and developing of the School Gardens Project.
- Currently four one on one consultations are scheduled. There are two GHP/GAP training classes scheduled for October 2012 and the FSPC anticipates several consultations to develop from these classes.
- To increase awareness and interest of the GHP/GAP program:
 - The FSPC and the Manager of the Agricultural Consultation and Training Program (ACT) have discussed issuing a public announcement or press release via the Department's Public Information Officer regarding the existence of this program and how it relates to the public.
 - The FSPC has also enrolled in the University of Arizona's CES Beginning Farmers Program to bring the message to the grassroots level and has made presentations and has attended meetings to answer questions or to present ideas regarding the GHP/GAP program and food safety.
 - The Coconino County (AZ) Health Department (Flagstaff) has been in contact with the FSPC to present the GHP/GAP program to their local growers in a one hour or one half hour presentations either in person or by conference call.
 - The FSPC is scheduled to address the Arizona Department of Health Services (ADHS) to present the GHP/GAP program to registered sanitarians. By informing the RS's they may be able to spread the word of the GHP/GAP program.
 - The FSPC is scheduled to attend the Association of County Directors of Environmental and Health Services of Arizona (ACDEHSA) to provide information regarding the GHP/GAP program and how it will relate to school gardens.

Funding Expended To Date

A total of \$13,082.11 had been expended as of September 30, 2012.

Fruit and Vegetable Learning Garden

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- Met at the Zoo with stakeholders including Zoo personnel, EPS (landscape architect), Western Growers Foundation and Rousseau Family Farms. We determined that we could accomplish the project in one phase rather than three and EPS was instructed to create construction documents accordingly.
- EPS began construction documents.
- Western Growers continued updating the producepedia site for the launch/promotion.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- Began preparing construction documents
- Worked with zoo to determine signage and video displays
- Set meeting for 5/11/12 to plan groundbreaking in August

Third Quarter (Apr. 2012 – June 2012) Activities:

- Met with Zoo and stakeholders on 5/11/12.
- Landscape architect and Zoo staff are finalizing construction docs
- Began discussions of marketing/promotion with Zoo personnel and WGF
- Ground breaking moved to November 2012

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- Continued on construction documents, county permits, coordinating with Zoo on timing to for ground-breaking.

Problems and Delays

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- We do have a delay, but it will be an advantage for us. The Zoo recently received funding to renovate the school house. This renovation needs to be done prior to planting the fruit and vegetable garden because the renovation crew and equipment will need to cut across the garden area. Once the school house is done, we will begin construction of the garden. We anticipate this to be August 2012. This will delay our start, but will not delay the overall project because we have determined our project will be done in one Phase rather than three.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- No delays other than the change listed above.

Third Quarter (Apr. 2012 – June 2012) Activities:

- No delays – we're still ahead of grant schedule

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- The original grant had a schedule to do the garden in phases, concluding the construction in 9/2013. Our plan is to complete it in one phase that was supposed to start in 8/2012, then 11/2012. Because of the school house renovations, the garden has been postponed twice. We will find out more on 11/14/12, but anticipate that at that meeting, we will know exactly when we can begin landscaping and planting.

Future Project Plans

The renovation of the school house continues to take longer than the Zoo expected. Thus, the garden is delayed. In the meantime, EPS Group continues to create construction documents for landscape, electrical, mechanical, structural and irrigation and get any city/county permits. A meeting is scheduled for 11/14/12 to see where the school house is and when we can begin construction on the garden.

Project Activity	Who's Responsible	Timeline
<ul style="list-style-type: none"> • Planning, construction docs, collect bids • New zoo staff and EPS staff, bring up to speed • Wait for school house to be complete • Manage project, maintain reports budget 	EPS/Zoo All All WGF	Oct 2011 – Feb 2013
<ul style="list-style-type: none"> • Clearing, grading and site preparation. Construction of raise fruit and vegetables planters, installation of concrete pavers, preparation/work on counter, worm bin, composting bins and crop fields for additional fruit and vegetable planting and educational video display for learning activities. • Print promotional materials and lesson plans • Launch promotion • Manage project, maintain budgets and reports 	Zoo/ Rousseau/ contractors WGF Zoo/WGF WGF	Feb 2013 – Jun 2013
<ul style="list-style-type: none"> • Maintain garden • Conduct lessons in garden • Continue promotion • Measure visitors, web traffic • Manage project, maintain budgets and reports 	Zoo Zoo Zoo/WGF Zoo/WGF WGF	Jun 2013 – Sep 2014

Funding Expended To Date

A total of \$7,496.13 has been expended as of September 30, 2012.

Promoting Floriculture through Agricultural Education

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- Sent students to participate in the National FFA Convention for the Floriculture Career Development Event. Students were evaluated on skills obtained through performance events relating to the Floriculture industry and national academic standards for Agriscience/Floriculture
- Career Development Event competition was held in partnership with South Mountain Community College, ASU Polytechnic and several industry professionals for 20 schools (approx. 80 students).
- Initial plan/development of promotional video implemented. Key partners/experts contacted and content of the video is beginning development.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- No Activity

Third Quarter (Apr. 2012 – June 2012) Activities:

- Contracted with professionals in the Floriculture industry to prepare professional development for teachers
- Continued work on promotional video
- Developed curriculum to be used in site/classroom visits

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- Local programs/districts implement plans to promote Floriculture in local communities
- Arizona delegation prepares to attend the national FFA convention for Floriculture activities
- Curriculum implemented in classrooms to promote specialty crop projects. Eight interns were trained in the summer of 2012 with curriculum to take into Agricultural Education programs in Arizona. As a part of that curriculum, a special unit was developed to cover opportunities for students to obtain and maintain a work based learning project (referred to a Supervised Agricultural Experience or “SAE”) that fall within the area of specialty crop production. From August 2012 to September 2012, over 65 schools were visited and over 7,000 students were reached. Over 90% of them received the instruction on specialty crop production. Teachers were asked to follow up with students after the interns left to assess effectiveness of the lessons and likelihood that the students would pursue a project in the specialty crop area for that school year. Over 80% of the teachers reported that the lessons were well organized and well received. From the same surveys, over 75% of the students reported that they were very likely or likely to pursue a project in the specialty crop area.

Problems and Delays

No delays in implementing program.

Future Project Plans

In the final quarter, teachers will be surveyed to ascertain the improvement/growth of student projects in the area of specialty crops. Teachers will also be asked to report on the effectiveness of the professional development and promotional materials provided.

Funding Expended To Date

A total of \$29,856.00 has been expended as of September 30, 2012.

Arizona Grown – Eat Local, Plant Local, Buy Local

This project was completed on September 30, 2012

Project Summary

- The goal of this grant was to increase sales of Arizona specialty crop produce and plants and emphasize purchasing local produce and plants. Arizona Grown has always had a specialty crop focus but, now with this grant we are able to re-introduce consumers to “Arizona Grown” specialty crops
- Drive awareness through increased Web traffic to the Arizona Grown microsite.
- A tool for growers to connect with consumers.

- With the vastly changing growing seasons and crops, this project helped push the specialty crops in the peak production time frame.

Project Approach

- R & R Partners used a variety of social media channels as avenues to drive traffic to the main website, arizonagrown.org. Facebook continues to be the largest and most influential social network on the web. With the network's large reach and advertising capabilities, it becomes a great channel to promote specialty crops through Arizona Grown and have mutual conversations with the community and network.
- Developed a social feedback loop allowing the tracking of current successes and to mold future activities to increase engagement and grow the network.
- Determine the appropriate content in order to reach target audience.
- Partners keep social networks current

Goals and Outcomes Achieved

- Creation of Arizona Grown webpage www.arizonagrown.org and Face book page www.facebook.com/arizonagrown
- Content creation, ideation and calendar management
- Traditional media placement and printing
- The success of this grant is measured by the “likes” on the AZ Grown Facebook. The page has tripled simply by ensuring that there was fresh daily content to come back and connect to. Online advertising ran through September 2012 and through cooperating partners has continued to enhance the success of the daily content of the page.
- Goal of 250 “likes” has been met and surpassed to currently over 800 “likes”.
- A greater awareness of locally specialty crop grown produce and plants that results in an increase in purchases of both at the consumer level.
- Established key performance indicators for reporting.
- Articles in Arizona Nursery Association & Western Grower magazines. (**Appendix C**)

Beneficiaries

- Western Growers - A tool for growers to connect with consumers.
- Arizona Nursery Association — locally grown plants — better quality and shorter shipping processes are increasing the appeal to budget-conscious consumers who want healthy plants.
- Arizona Department of Agriculture — building a greater awareness surrounding the brand and logo as well as to educate consumers on the benefits of buying quality AZ grown as well as local produce and plants.
- Consumers — interacting with other consumers who are interested in locally grown produce and plants.
- All of the above listed beneficiaries benefited from this grant as AZ Grown plants and produce were promoted to the end consumer thus exposing them to the fact that AZ Grown options are available in their local supermarkets and nurseries. The two associations have a combined membership of approximately 500 members who in some

way market their products to the consumers. These specialty crop growers and retailers directly benefited from this promotion. Although an economic impact is not available at this time, awareness was raised as documented by phone calls and inquiries made to both associations as well as their members.

Lessons Learned

- The grantees learned and still need to develop a method to interact with retail nurseries, farms, restaurants, partners, etc to ensure that Arizona Grown relevant events/news that is taking place can be added to the website or advertised on the Facebook page. We would encourage other grantees interested a project such as this to find a vast contact list and a manageable method to obtain this information
- The grantees also learned that posting to a Facebook page is an ongoing task and not something you just develop and leave. A key to the success of our “likes” is that we actually paid the agency to write this copy and keep it going. Other grantees need to consider the time and resources it takes to fully manage a conversation on Facebook and keep it relevant and interesting.
- The grantees also learned that digital billboards are an extremely effective marketing tool in this area and would encourage others to explore that advertising method.

Contact Person

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datkinson@azda.gov

Additional Information

- www.azda.gov
- www.plant-something.org/home
- www.wga.com

Plant Something Campaign – Public Outreach

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- No activity.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- Held two conference calls with Plant Something partners to discuss details and acquisition of new states as well as rules of promotion.
- Added two new state partners, Colorado and Idaho.
- Promoted the National aspect of the Plant Something campaign at the ANLA 4 day Management Clinic in Louisville, KY. Generated lots of interest and inquiries by running a tabletop display.
- Presented at the ANLA Management Clinic – 2 presentations, one to growers and one to retailers.
- Presented about the Plant Something grant at Big Mac to the review committee.

- Promoted the Plant Something grant at 4 local lunch connections for ANA in Jan, Feb and March.
- Sent several inquiry packets to states who are interested in the Plant Something campaign.
- Installed a Dropbox on the Plant Something website for states to share artwork.
- Promoted the campaign during Prescott member visits.
- Developed a monthly email plan to keep Partners up-to-date on activities.
- Attended Las Vegas meeting to develop plans for new state partners on Plant Something initiative.
- Reported at ANA board meeting about Plant Something campaign.
- Worked with AZ Community Tree Council to further promote the Plant Something campaign.

Third Quarter (Apr. 2012 – June 2012) Activities:

- Held conference calls with Plant Something partners to keep them involved in the promotion and to exchange ideas
- Began process of producing :30 second video PSA with Park & Co. Reviewed initial draft.
- Staffed an Earth Day event at the City of Phoenix promoting the Plant Something campaign.
- Developed a promotional sheet for the campaign so the AZ Dept of Agriculture could use it and sent it to other state departments of agriculture.
- Gave ANA Board update and presentation on Plant Something current and future plans.
- Reorganized and designed Plant Something Dropbox for access by ANA and State Partners.
- Sent information to various states about joining the promotion.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- Designed, approved and received final copies of the Plant Something :30 PSA.
- Distributed the PSA to media outlets and city water conservation offices.
- Held a Plant Something Partner conference to be updated on what is going on with the promotion from our other state partners.
- Signed British Columbia and Ohio to the Plant Something promotion.
- Presented about Plant Something and debuted the video at ANA's SHADE conference as well as at a member LLC.
- Received our first report of PSA airings. Two stations, KAZT-13 in Phoenix and KOLD in Tucson have aired the spots. Since they are PSAs, they do not track airtime however an estimate of over 40 spots was reported. Most stations are keeping the PSA in their line-up on an as needed basis to fill airtime.
- Fall 2011 (Sept - Nov) paid radio advertisements aired were: 2476 total :30 spots. For 2012 (Feb-May & Oct-Nov) paid radio advertisements aired were: 893 total :30 spots and :60 spots (not possible to distinguish how many of which length). The spots are the same commercial we have previously aired.

Problems and Delays

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- None yet as we have not had any activity.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- Things seem to be moving along as projected. State partners seem to be joining and more awareness of the campaign is happening. The PSA project might be more detailed and take longer than originally expected however it is too soon to tell at this point.

Third Quarter (Apr. 2012 – June 2012) Activities:

- Goals are beginning to be accomplished and project the PSA will be finished in the next quarter ready for promotion. We also expect to sign additional partners after a July show and as a result of all the Department of Agriculture promotion.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- None at this time.

Future Project Plans

Advertising will be placed in appropriate media for fall promotion of Plant Soemthing. We will continue to engage in any public events which would be good promotion for the campaign as well as work with other states to enlarge the participant base.

Funding Expended To Date

A total of \$55,806.51 has been expended as of September 30, 2012.

Advancing Mechanization and Automation in Lettuce

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- During this quarter, we completed the design plans to modify the automated thinning machine so that it can be used as an automated weeder as per the project work plan. The plan includes modifying the machine was that it will be able to spray an herbicidal solution in 1) the plant row between crop plants and in 2) between the seed lines (“middles”). Design plans were also completed so that herbicide storage tanks and spray system assemblies can be mounted on the machine. These components are needed to complete the field trials planned for next quarter.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- During this quarter, the automated thinning machine was modified so that it can be used as an automated weeder. The machine was modified so that it is able to spray an herbicidal solution in 1) the plant row between crop plants and in 2) between the seed lines (“middles”). Herbicide storage tanks and spray system assemblies were mounted on the machine. The planned field trial to evaluate the machine’s performance as compared to hand weeding was initiated and pre-weeding weed counts were made. We were unable to complete the trial due to the failure of an electronic component on the

machine that we were unable to replace before the crop became too large for weeding. We have identified a consulting firm to upgrade the software components so that the machine can operate as an automated weeder and spot sprayer. We expect to begin working with them in the middle of next quarter.

Third Quarter (Apr. 2012 – June 2012) Activities:

- During this quarter, hardware modifications were made to the machine so that it can be used as a spot sprayer. The paperwork required for hiring a consulting firm to upgrade system software so that the machine can operate as an automated weeder and spot sprayer was generated and submitted to the University of Arizona for processing.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- Control Systems Innovations (CSI) was hired as the consulting firm to upgrade the software and electronic control systems for the second generation machine. They commenced work in August, 2012. Although this start date is later than desired, the company is on target to have initial programming completed by next quarter.

Problems and Delays

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- During this quarter, disagreements about intellectual property rights to the automated thinner technology emerged between the outside contractor who programmed the device's machine vision system and the University of Arizona's Office of Technology Transfer. Until this issue is resolved, the contractor has refused to initiate making the planned changes to the software. Although we are working to resolve the dispute, it is unlikely that an agreement will be reached soon. As a consequence, it will probably be necessary to hire a new contractor to move the project forward. If it is done, the original budget may need to be revised. In the meantime, we have made modifications to the existing prototype thinning machine so that the project milestone of evaluating its performance as a weeding machine can be accomplished as planned.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- Identifying a new contractor to upgrade the software components so that machine can operate as an automated weeder and spot sprayer took longer than expected. Although this will delay the project, we fully expect to have the machine completed by September, 30 2012 as per the project plan. Another delay was not being able to conduct the weeding trial planned for the spring of 2012 due to an unexpected equipment failure. This problem can be overcome by conducting the trial in the fall of 2012 without compromising the research objectives or measureable outcomes of the project.

Third Quarter (Apr. 2012 – June 2012) Activities:

- Processing the paperwork to get a contract agreement in place so that the outside consulting firm can commence work and begin upgrading system software has taken much longer than expected. We expect to have the agreement in place early next quarter so that work can commence. If this happens, we expect to have the machine upgrades completed by fall of 2012 so that planned research trials can be conducted as per the project work plan.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- Due to continued delays in paperwork processing, we were unable to get a contract agreement in place with the outside consulting firm until August, 2012. As a consequence, work commenced much later than expected and we do not expect to have an operational machine until the spring of 2013. This will prevent us from conducting research trials that were planned for the fall of 2012 and probably the ones planned for spring of 2013. As a consequence, the project work plan/timeline will need to be modified and/or extended in order to complete the project.

Future Project Plans

Because of the unexpected dispute with the original contractor and delays in hiring a new contractor to make necessary programming and electronic changes, we do not expect to have an operational automated weeding and spot spraying machine until the spring of 2013. This is one year later than expected. Due to these unforeseen delays, the project is about one year behind schedule. In order to complete the project as planned, it will be necessary to ask for a one year extension. If this were permitted, we have every expectation that the project goals and outcomes will be achieved.

Project Activity	Who*	Timeline
Fabricate and program automated weeder	Technician, CSI, PI	Jan-Mar, 2013
Test and debug automated weeder prototype	Technician, CSI, PI	Apr-Sep, 2013
Conduct 1 st year weeding trial	Technician, PI	Oct-Dec, 2013
Fabricate and program automated spot sprayer	Technician, CSI, PI	
Conduct 1 st year spot sprayer trial	Technician, PI	
Conduct 2 nd year weeding trial	Technician, PI	Jan-Mar, 2014
Conduct 2 nd year spot sprayer trial	Technician, PI	
Present at Southwest Ag Summit	PI	
Present at Desert Ag Conference	PI	Apr-Jun, 2014
Summarize data, write manuscript(s)	PI	
Present paper at ASABE AIM professional conference	PI	

* Technician is Mr. Ron Gayler, CSI is Control Systems Innovations, PI is Dr. Mark C. Siemens

Funding Expended To Date

A total of \$1,752.54 has been expended as of September 30, 2012.

Bagrada Bug IPM in Arizona Vegetables

Activities Performed

First Quarter (Oct 1, 2011– Dec 31, 2011) Activities:

- The objectives of this project are to develop a solid understanding of the Bagrada bugs seasonal migration among weeds and crops, it's damage potential on developing crops, and the most effective ways to use insecticide alternatives to control the pest. During this first quarter, we were too late to initiate any field trials to quantify feeding impacts of Bagrada adults on the damage / yield to cole crops in the field. We have initiated however, several studies in the greenhouse and laboratory to begin documenting the feeding impacts of Bagrada adults on cotyledon stage plants. In addition, we have

constructed several small and large rearing cages for the maintenance of a *Bagrada* colony that will be used in our greenhouse and lab trials, and have begun to start a *Bagrada* bug colony. We have initiated our seasonal migration studies by identifying potential suites to survey for the presence of the adults this spring and summer. Finally, one field study and two laboratory studies measuring insecticide efficacy against *Bagrada* adults have been conducted to date.

Second Quarter (Jan 1, 2012– Mar 31, 2012) Activities:

- During this first quarter, we completed several studies in the greenhouse and laboratory to begin documenting the feeding impacts of *Bagrada* adults on cotyledon stage plants. We continue to utilize our large rearing cages for the maintenance of a *Bagrada* colony. Our colony is now very robust and will be used to support a number of greenhouse and field studies this summer. We have continued our seasonal migration studies by identifying potential suites to survey for the presence of the during this quarter. This entailed visiting 6 field sites and sampling all available crop and weed hosts for *Bagrada*.

Third Quarter (April 1, 2012– Jun 30, 2012) Activities:

- We continue studies in the greenhouse and laboratory to begin documenting the feeding impacts of *Bagrada* adults on cotyledon stage plants. We continue to utilize our large rearing cages for the maintenance of a *Bagrada* colony. Our colony is now very robust and will be used to support a number of greenhouse and field studies this summer. We have continued our seasonal migration studies by identifying potential suites to survey for the presence of the during this quarter. This entailed visiting 6 field sites bi-monthly and sampling all available crop and weed hosts for *Bagrada*. We also conducted some bioassays to investigate the efficacy of biological insecticides against *Bagrada* adults.

Fourth Quarter (Jul 1, 2012– Sep 30, 2012) Activities:

- We completed several studies in the greenhouse and laboratory that examined the feeding impacts of *Bagrada* adults on cotyledon stage plants. We also conducted a no-choice preference trial in the greenhouse and identified several crop hosts that *Bagrada* adults appear to prefer. We continue to utilize our large rearing cages for the maintenance of a *Bagrada* colony. We have continued our seasonal migration studies during this quarter by visiting 6 field sites bi-monthly and sampling all available crop and weed hosts for *Bagrada*. We also conducted some bioassays to investigate the efficacy of biological insecticides against *Bagrada* adults. Beginning in August, we initiated several trials to investigate chemical control, diel activity and sampling, and the impact of *Bagrada* feeding on plant growth and yields in small plot field trials.
- During this quarter information generated from this project was delivered to stakeholders (>150 stakeholders) via educational extension meetings held in Yuma, AZ, Imperial Valley, CA, and San Diego, CA. During the past year, over 500 stakeholders have been exposed to this information via meetings held in Phoenix, AZ, Casa Grande, AZ, Yuma, AZ, Maricopa, AZ, Brawley, CA, and San Diego, CA. A number of extension publications and guidelines on the results to date have been generated and can be found at <http://ag.arizona.edu/crops/vegetables/advisories/archive.html> . These are available to

stakeholders via our VegIPM Updates email system that has a mailing list serve over 400 individuals.

Problems and Delays

None

Future Project Plans

No changes for our proposed plan of action are expected.

Funding Expended To Date

A total of \$50,406.78 has been expended as of September 30, 2012.

Evaluating Septic Influence on Irrigation Canals

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- Outcome 1:** *Quantitative data on the spatial and temporal variations of E. coli contamination and other microbial pathogen indicators in canal systems.*
- The project team is currently working with local stakeholders and Dr. Kurt Nolte to identify specific locations, or “hot spots” for water quality sampling to take place throughout the Yuma Valley where canals are suspected to be impacted by failing septic systems. Sample collection and analysis is scheduled to begin during the next quarter of the project funding.
 - Maps have been collected by project partners from local irrigation districts, Yuma Water Users Association, as well as members from the County Health Department.
 - Ground water level maps are current being sought by the project team from the US Bureau of Reclamation also in Yuma.
 - Kelley Riley, the lab manager on this project, has been working to identify anticipated sampling locations as well as training students on appropriate sample collection, transport, and processing techniques in preparation for sample collection that will begin during the next quarter.
- Outcome 2:** *Measurement of microbial fate and transport in irrigation systems and provision of recommendations to further identify biological and geographical sources through microbial source tracking and to reduce the risk of microbial contamination on fresh produce.*
- Initiation of sample collection for Outcome 2 will begin during the next reporting period.
- Outcome 3:** *A detailed results document that will facilitate on-the-ground mitigation efforts to produce measurable reductions in E. coli and other pathogens in irrigation water.*
- This outcome is in progress and has not been completed.

Outcome 4: *Increased understanding of irrigation water quality problems by growers to support additional water quality improvement on the behalf of stakeholders and educators in Yuma County.*

- In anticipation for sample collection and information dissemination, the project team held a stakeholder meeting consisting of representatives from the local grower community, members of the Leafy Green Marketing Agreement, as well as food safety experts, University Specialists and Faculty. This meeting was held in Yuma at the Yuma Agricultural Center on December 16, 2011.
- During this meeting, our research team presented the project overview to the stakeholders as well as fielded questions related to the water quality problems that growers are currently facing in Yuma County. The number of stakeholders that attended this meeting was approximately 21. This does not include personnel from the University of Arizona and represents an increase in meeting attendance from previous stakeholder meetings (n=6) held in 2010.

Second Quarter (Jan 1, 2012 – Mar 31, 2012) Activities:

Outcome 1: *Quantitative data on the spatial and temporal variations of E. coli contamination and other microbial pathogen indicators in canal systems.*

- Since the initial project quarter the project team finalized “hot spot” locations throughout the Yuma Valley with the help of Dr. Kurt Nolte, where canals are suspected to be impacted by failing septic systems. Sample collection and analysis has begun during this quarter of the project.
- Ground water level maps are currently being sought by the project team from the US Bureau of Reclamation also in Yuma.
- Kelley Riley, the lab manager on this project, has finalized sampling locations and students have been trained on appropriate sample collection, transport, and processing techniques. Currently, she is working with project partners to collect and analyze water samples.
- Extensive effort was taken during this reporting period to evaluate best methods for microbial water quality analysis specifically for the bacteria *Salmonella*. After this extensive evaluation we are confident in the method selected and the subsequent water quality data generated using this method.

Outcome 2: *Measurement of microbial fate and transport in irrigation systems and provision of recommendations to further identify biological and geographical sources through microbial source tracking and to reduce the risk of microbial contamination on fresh produce.*

- Sample collection for Outcome 2 has been initiated during this project period. To date we have collected 15 water samples over the course of three sampling trips in the specified “hot spot” location(s) in Yuma canal systems.

- The following tests were used to evaluate water quality; *Salmonella*, *E.coli*, Bacteroides sp., HPCs, conductivity, turbidity, TDS, pH, and temperature.
 - Samples have also been filtered and archived for the microbial source tracking analysis. This analysis will be completed during the next reporting period.
- Outcome 3:** *A detailed results document that will facilitate on-the-ground mitigation efforts to produce measurable reductions in E. coli and other pathogens in irrigation water.*
- This outcome is in progress and has not been completed.
 - The project team is working to develop a data reporting format (Excel) that is user friendly in anticipation of project information dissemination at the culmination of the project.
- Outcome 4:** *Increased understanding of irrigation water quality problems by growers to support additional water quality improvement on the behalf of stakeholders and educators in Yuma County.*
- Since the beginning of sample collection, the project team held a stakeholder meeting consisting of representatives from the local grower community, members of the Leafy Green Marketing Agreement, as well as food safety experts, University Specialists and Faculty. This meeting was held in Yuma at the Yuma Agricultural Center on March 7th -8th, 2012 during the Southwest Ag Summit.
 - During this meeting, our research team presented initial project data to the stakeholders as well as fielded questions related to the water quality problems that growers are currently facing in Yuma County. The number of stakeholders that attended this meeting was approximately 9. This does not include personnel from the University of Arizona and represents an increase in meeting attendance from previous stakeholder meetings (n=6) held in 2010.
 - Additionally, project PIs regularly attend University of Arizona Food Safety Consortium meetings to describe project outcomes to others in the University food safety community. During this reporting period project PIs attended a meeting held on March 1st in Tucson, AZ.

Third Quarter (April 1, 2012 – Jun 30, 2012) Activities:

- Outcome 1:** *Quantitative data on the spatial and temporal variations of E. coli contamination and other microbial pathogen indicators in canal systems.*
- Since the initial project quarter the project team finalized “hot spot” locations throughout the Yuma Valley with the help of Dr. Kurt Nolte, where canals are suspected to be impacted by failing septic systems. Sample collection and analysis has continued during this quarter of the project.
 - Kelley Riley, the lab manager on this project, has finalized sampling locations and students have been trained on appropriate sample collection,

transport, and processing techniques. Currently, she is working with project partners to collect and analyze water samples.

- The best methods for microbial water quality analysis specifically for the bacteria *Salmonella* has been finalized and is currently being used for water quality evaluation.

Outcome 2: *Measurement of microbial fate and transport in irrigation systems and provision of recommendations to further identify biological and geographical sources through microbial source tracking and to reduce the risk of microbial contamination on fresh produce.*

- Sample collection for Outcome 2 has continued during this project period. To date we have collected 30 water samples over the course of six sampling trips in the specified “hot spot” location(s) in Yuma canal systems.
- The following tests were used to evaluate water quality; *Salmonella*, *E.coli*, Bacteroides sp., HPCs, conductivity, turbidity, TDS, pH, and temperature.
- Samples have also been filtered and archived for the microbial source tracking (MST) analysis. MST has been initiated during this reporting period and approximately 30 samples have been analyzed to date.

Outcome 3: *A detailed results document that will facilitate on-the-ground mitigation efforts to produce measurable reductions in E. coli and other pathogens in irrigation water.*

- This outcome is in progress and has not been completed.
- The project team is continuing to work to develop a data reporting format (Excel) that is user friendly in anticipation of project information dissemination at the culmination of the project.

Outcome 4: *Increased understanding of irrigation water quality problems by growers to support additional water quality improvement on the behalf of stakeholders and educators in Yuma County.*

- No stakeholder meetings have been held during this quarter, however, the project team is in the process of planning our next outreach event to be held on October 12th in Tucson, Arizona. Representatives from the local grower community, members of the Leafy Green Marketing Agreement, as well as food safety experts, University Specialists and Faculty will be target participants for this meeting.
- Additionally, project PIs regularly attend University of Arizona Food Safety Consortium meetings to describe project outcomes to others in the University food safety community. During this reporting period project PIs attended meetings held on April 5th, May 3rd, and June 14th in Tucson, AZ.

Fourth Quarter (Jul 1, 2012 – Sep 30, 2012) Activities:

Outcome 1: *Quantitative data on the spatial and temporal variations of E. coli contamination and other microbial pathogen indicators in canal systems.*

- Canals suspected to be impacted by failing septic systems have been targeted for sample collection and analysis has continued during this quarter of the project.
- The best methods for microbial water quality analysis specifically for the bacteria *Salmonella* has continued to be successful and is currently being used for water quality evaluation.

Outcome 2: *Measurement of microbial fate and transport in irrigation systems and provision of recommendations to further identify biological and geographical sources through microbial source tracking and to reduce the risk of microbial contamination on fresh produce.*

- Sample collection for Outcome 2 has continued during this project period. To date we have collected 40 water samples over the course of eight sampling trips in the specified “hot spot” location(s) in Yuma canal systems.
- The following tests were used to evaluate water quality; *Salmonella*, *E.coli*, *Bacteroides* sp., HPCs, conductivity, turbidity, TDS, pH, and temperature.
- Samples have also been filtered and archived for the microbial source tracking (MST) analysis. MST has been continued during this reporting period and approximately 40 samples have been analyzed to date.
- Initial results show that *E.coli* and *Salmonella* were detected in all sample locations (5 locations total) and that approximately 20% of all samples collected contained detectable levels of *Salmonella*.
- Additionally, microbial source tracking results show a strong indication of human fecal matter across all sample locations tested.

Outcome 3: *A detailed results document that will facilitate on-the-ground mitigation efforts to produce measurable reductions in E. coli and other pathogens in irrigation water.*

- The project team is currently working to develop a data reporting format (Excel) that is user friendly in anticipation of project information dissemination at the culmination of the project.
- The data results document currently has water quality information related to microbial and chemical parameters that are important to stakeholders. Additional information about each of these parameters will be incorporated into the final document and be used as an educational tool for our stakeholder partners.

Outcome 4: *Increased understanding of irrigation water quality problems by growers to support additional water quality improvement on the behalf of stakeholders and educators in Yuma County.*

- One stakeholder meeting was held during this quarter in Yuma, AZ. Representatives from the local grower community, members of the Leafy

Green Marketing Agreement, as well as food safety experts, University Specialists and Faculty were in attendance at this meeting on August 7th.

- Additionally, project PIs recently attended the University of Arizona Food Safety Conference. During this meeting project PIs described project outcomes to others in the University food safety community. This meeting was held on October 12, 2012 in Tucson, AZ.

Problems and Delays

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- There have been no problems or delays within the first quarter of the project period. A master's level student, Natalie Brassill, has been hired to work towards the completion of the project and her contract was finalized on January 8th, 2012.
- Since the onset of the project, Dr. Jean McLain has transferred from her position at the USDA-ARS to the University of Arizona, Water Resources Research Center. She has remained involved with the project and will continue to serve as a member of the research team. During the next quarter, the project PI will work with the appropriate contact at the Arizona Department of Agriculture to modify the contract as needed.
- Since the onset of the project, Dr. Jorge Fonseca has taken a leave from the University of Arizona and is currently on sabbatical. While he is on leave for the duration of the project his portion of the project will be taken over by the project PI, Dr. Channah Rock. During the next quarter, the project PI will work with the appropriate contact at the Arizona Department of Agriculture to modify the contract as needed.

Second Quarter (Jan 1, 2012 – Mar 31, 2012) Activities:

- There have been no problems or delays within the second quarter of the project period.

Third Quarter (April 1, 2012 – Jun 30, 2012) Activities:

- There have been no problems or delays within the third quarter of the project period.

Fourth Quarter (Jul 1, 2012 – Sep 30, 2012) Activities:

- There have been no problems or delays within the third quarter of the project period.

Future Project Plans

- In the final reporting period for this project, we anticipate the completion of sample collected by project participants and complete data analysis.
- Additionally, during this final reporting period stakeholder workshops will be held to disseminate research findings. These workshops will be held in Yuma, AZ early next year.

Funding Expended To Date

A total of \$18,453.36 has been expended as of September 30, 2012.

Evaluation of Pomegranate Varieties for Arizona

In order to advance the timeline of this project, and in anticipation of a successful proposal we ordered 27 varieties of pomegranates from the USDA Pomegranate Germplasm Repository at Davis, CA in December, 2010.

In Feb. 2011, we acquired the following 27 varieties from the USDA:

1. 'Sin Pepe': yellow/pink rind, light pink to light red aril, very soft seed, sweet flavor
2. 'Fleischman's': light yellow/ pink rind, light pink to light red aril, soft seed, sweet flavor
3. 'Azadi': mostly white rind, pink aril, soft seed, sweet flavor
4. 'Medovyi Vahsha': red rind, red aril, soft seed, sweet flavor, very productive trees
5. 'Sogdiana': red rind, red aril, soft seed, sweet flavor
6. 'Sirenevyy': tan to red rind, red aril, soft seed, complex, sweet flavor
7. 'Gissarkii Rozovyi': yellowish to red rind, light red aril, soft seed, good balanced flavor
8. 'Myagkosemyannyi Rosovyi': yellow/pink rind, pink aril, soft seed, good flavor
9. 'Pamyati Rozanov': red rind, red aril, soft seed, good balanced flavor
10. 'Parfianka': red rind, red aril, soft seed, good flavor balance
11. 'Desertnyi': tan to red rind, red aril, soft seed, good flavor balance (strong citrus notes)
12. 'Vkusnyi': red rind, red aril, soft seed, good flavor balance
13. 'Ariana': red rind, red aril, soft seed, good flavor balance. Reportedly good in the heat.
14. 'Molla Nepes': red rind, reds aril, soft seed, good flavor but tends to be a bit tart
15. 'Wonderful': red rind, red aril, med. seed, good flavor (standard variety)
16. 'Palermo': red rind, red aril, med. seed (similar to 'Wonderful'), good balanced flavor
17. 'Cranberry': red rind, red aril, crunchy seed, good balanced flavor
18. 'Purple Heart': red rind, red aril, med. crunchy seed, good flavor, good production
19. 'Kara Bala Miursal': red rind, red aril, med-hard crunchy seed, very productive
20. 'Nikitski Ranni': red rind, hard seed, good balanced flavor, very productive tree
21. 'Haku-botan': greenish white rind, white double flowers. Fruit and juice are tart.
22. 'Haku-taka': Ornamental variety from Japan
23. 'Ki-Zakuro': Japanese variety with pink and white double flowers
24. 'Nochi-shibori' : Japanese variety with red double flowers
25. 'Toryu-shibori' : Japanese variety with salmon-colored double flowers and yellow fruit
26. 'Syunt' : Excellent, large, sweet, fruit has soft seeds, with white juice and arils
27. 'Sverkhraaniy': The name translates as "super early". Fruit can ripen in early August

In Mar. 2011, we acquired 'Angel Red', early with soft seeds and good color, from Willis Nursery (GA) as our 28th variety.

All plants were propagated at the University of Arizona Greenhouse complex, under the supervision of Dr. Schuch. Growing media (perlite and peatmoss) was mixed at 1:1 ratio by volume. HIKO planting trays (Stuwe and Sons, Inc., Tangent, OR) measuring 35.2 cm long and 21.6 cm wide were filled with the prepared media. There were 24 cells per tray and each cell measured 5.1 cm wide and 10 cm deep. All twenty-eight (28) cultivars of pomegranates were propagated for this study. Hardwood cuttings about 50-60 cm long and pencil size thick branches were received from USDA-ARS –National Clonal Germplasm Repository, University of California, Davis, CA. On February 18, 2011 hardwood cuttings were cut into 20 cm long pieces

which resulted in 2 or 3 cuttings from each branch. Immediately after cutting, the basal ends were dipped in 10% Dip N Grow (Dip'N Grow, Clackamas, OR) solution for 5 seconds, and then were planted into the trays. The bench heating system was set to 26.67° C and cuttings were misted frequently during daylight hours. Hardwood cuttings of 'Angel Red' were propagated in the same manner in March, 2011. On May 5, 2011 all rooted cuttings were potted into tree pots (Stuwe and Sons, Inc., Tangent, OR) (12.7 cm wide, 24.1 cm long and 2.54 L volume) with potting substrate containing compost (50 %) and cinder + peatmoss (50%).

An additional order of softwood cuttings of cultivars that did not yield 12 or more viable plants arrived from the USDA on July 1, 2011 and was placed on a misting bench using the procedures described above.

Activities Performed

First Quarter (Oct 1, 2011 – Dec 31, 2011) Activities:

- In November 2011 the plants derived from hardwood cuttings were re-potted into 18.9 L containers. Plants were watered and fertilized as necessary. The total number of propagated plants was 153.
- In late fall plants derived from softwood cuttings were transplanted into 5.6 L containers with the substrate described above. In total 381 softwood cuttings were propagated and 223 rooted successfully. Rooting percentage varied widely for the different cultivars and for the hardwood and softwood cuttings.
- Dr. Wright has travelled to Tucson to inspect the plants and to consult with Dr. Schuch as needed.
- Meanwhile, we became aware of The Kino Heritage Fruit Trees Project in Tucson. The Project researches, locates, propagates and re-establishes historically appropriate fruit tree cultivars to the original orchards and gardens at Tumacácori National Historical Park and Tucson Origins Heritage Park. The Kino Project has donated 12 plants each of the following cultivars for our work:
 - 'Ruby' (this is not 'Ruby Red') a red pomegranate found near spring near the ghost town of Ruby.
 - 'Josefina' a white pomegranate from Tucson extremely sweet with white fruit.
 - 'Sosa Carillo' a delicious soft-seed pink pomegranate that appears to have been originally grafted onto a white pomegranate, planted in 1880's in Tucson.

These cultivars are currently at Civano Nursery in Tucson, and will be the 29th, 30th and 31st for the experiment.

Finally, Drs. Schuch and Wright located a cooperator in Southeastern Arizona. Mr. Larry Romney will allow us to plant our trial in a portion of his 46 acres of commercially grown pomegranates that are 5 miles north of the town of Bowie, AZ. All the fruit from this location will be harvested and Mr. Romney will not profit from this project. This location will be the third trial site, along with the Yuma Mesa Agriculture Center in Somerton, AZ and the Campus Agriculture Center in Tucson, AZ.

- In the original project proposal, we had no goals set for October through December, 2011. However, our goals for January to March 2012 were the identification and preparation of field sites and preparation of plant material. As of the end of 2011, we had identified all three fields.

Second Quarter (Jan 1, 2012– Mar 31, 2012)Activities:

- 2/16/12: Bare root plants of two cultivars (Granada and Wonderful) were potted into #5 containers.
- 2/22/12: Small liners and potted pomegranates (Josefina, Sosa Carrillo and Ruby) in 4” pots were picked up from Civano nursery and potted.
- 3/1/12: Glenn picked up first batch of 50 pomegranates for planting in Yuma. They were first placed in a lathhouse for 4 weeks prior to planting.
- 3/9/12: New hardwood cuttings of 19 cultivars were received from the USDA on 3/8/12 and were planted one day later. Procedures for making cuttings and planting were same as previously described.
- In the last week of March pomegranates in #5 containers that were to be planted in the field were moved from the greenhouse outdoors. They stayed for 10 days under 30% shadecloth and then were placed in full sun to harden off in preparation for field planting.



March 2012, new hardwood cuttings in greenhouse for rooting



New cuttings from USDA to propagate missing plants.

- 3/31/12. Field plot was established in Yuma, at the Yuma Mesa Agriculture Center, Block 15 (photo at right). Fifty of a total of 128 plants were planted in a randomized complete block design with four replications. Irrigation is by border flood.



Third Quarter (April 1, 2012– Jun 30, 2012) Activities:

Hardwood cuttings of 19 cultivars were received at the beginning of March and were rooted in the greenhouse under mist. They were transplanted into tree pots by mid-May and kept for a short time in the greenhouse. Once they were successfully established they were moved under shade outdoors in Tucson. After about three weeks under shade they were moved into full sun. About 60 pomegranate plants were transplanted into the field in the Bowie location on April 17, 2012. On June 6 about 30 more plants were transplanted into the field. Currently only 6 plants need to be planted to complete planting at this location. To date all transplants have survived in Bowie. Plants are irrigated with subirrigation on both sides of the root ball.



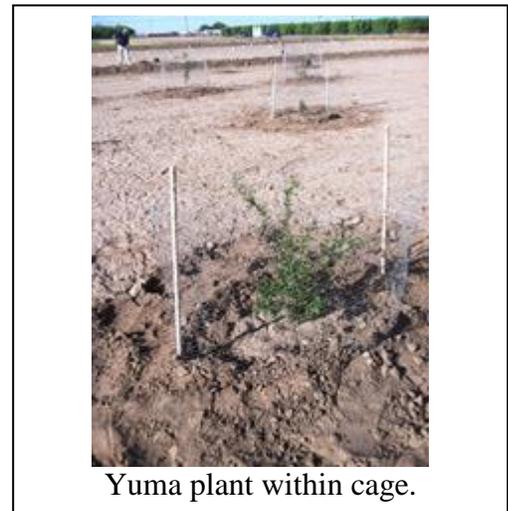
Bowie planting 4-17-12.

On May 7, 2012 about two thirds of the Tucson plants were transplanted to a field at the West Campus Agricultural Center of the University of Arizona. Follow-up planting was done on June 12. All except one plant that has been replaced survived transplanting and are growing well. Irrigation of the field has been done by flood irrigation and is now converted to subirrigation with buried drip lines. In Tucson a 3 foot tall fence was built around the field to prevent damage from rabbits or other rodents especially to the young plants. Weed control has been intense during the late spring and summer and after removing most of the spring weeds a pre-emergent herbicide has been applied with a rotary spreader.



Tucson field with fence

Meanwhile, in Yuma, we constructed individual “cages” made of chicken wire with wooden or PVC posts to protect the young plants from the rabbits. We also erected a chicken wire fence around the entire field to further discourage the rabbits. Workers tilled the alleys around the plants using a tractor drawn cultivator to control weeds outside the cages, and used hoes to control weeds within the cages. We transported 25 additional plants from the shade house in Tucson to Yuma on 4/21/12. We transplanted them to the Yuma site on 5/11/12, to join the 50 already established there. Another 41 plants were moved from Tucson to Yuma on 6/11/12, and we transplanted them into the field on 6/15/12. All 116 plants in the Yuma field are irrigated weekly via flood irrigation, and are growing well. The field will be complete with 12 more plants.



Yuma plant within cage.

Currently plants of Sin Pepe cultivar are being rooted under mist using the field plants in Tucson as stock. We are still short a few of those plants in some locations (I don't remember where). Pomegranate plants in containers are still kept outdoors to complete planting in all sites and to keep some plants for possible replacements in case not all plants survive the last transplanting.

Fourth Quarter (Jul 1, 2012-Sep 30, 2012) Activities:

July

- Made cuttings of Sin Pepe variety from the trees growing at Tucson site and were planted and rooted in greenhouse.
- Applied pre-emergent herbicide (50 lbs.), Snap-shot, to the entire field of Tucson test site. Then the field was flooded as per recommendation.
- Hand weeding in Tucson and around cages Yuma
- Farm crew in Yuma and Bowie removed weeds in the middles

August

- Round-up (2% solution) spraying – 8/1
- Planted (13) more trees at West Campus field – 8/16
- Collect vigor and flowering/fruited data at the West Campus field.
- Sorting, tagging and transporting (Campus Ag. Ctr. to West campus Ag. Ctr.) trees for Yuma - 8/18
- Planted final trees in Yuma, including construction of rabbit cages – 8/22
- Collected vigor and flowering/fruited data in Yuma – 8/22

September

- Round up (2% solution) spraying -9/12
- Hand weeding at Yuma site – 9/14
- Tree replacement at Bowie test site – 9/26
- Hand weeding at Tucson site – 9/29

Note: Regular check of remaining saplings at RRGH for fall over, irrigation, weeding, and fertilization.

Regular checks at Tucson, Bowie and Yuma field for irrigation, weeding and other needs.

This 3-year project will evaluate 28 varieties of pomegranate (*Punica granatum* L.) for their suitability at three different sites: Southwest Arizona, near Yuma, Southern Arizona near Tucson, and Southeast Arizona in Cochise County. At each site, plants will be evaluated for plant growth, precocity, yield and fruit quality.

Problems and Delays

First Quarter (Oct 1, 2011 – Dec 31, 2011) Activities:

- In the original proposal, we proposed to establish between 3 and 6 plants of each cultivar in each location. Because of our variable success in propagating the hardwood and softwood cuttings, it became apparent that we will be able to establish 4 plants of each cultivar per site, for most of the 31 selections. However, for those that have not been as successfully propagated, we will need to purchase additional plants or propagate more

cuttings in spring 2012. A complete inventory of the numbers of successfully propagated plants will be included in the report for the second quarter.

Second Quarter (Jan 1, 2012– Mar 31, 2012)Activities:

- We experienced no notable problems or delays during the quarter.

Third Quarter (April 1, 2012– Jun 30, 2012) Activities:

- We experienced no notable problems or delays during the quarter.

Fourth Quarter (Jul 1, 2012-Sep 30, 2012) Activities

- We experienced no notable problems or delays during the quarter.

Future Project Plans

For the first quarter, we will analyze the vigor and flowering/fruitleting data collected at the West Campus and the Yuma sites. We will also determine how to collect data for the next growing season.

Funding Expended to Date

A total of \$17,147.43 has been expended as of September 30, 2012.

Hedging Pecans: Yield, Quality, Economic Implications

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- Leaf samples were collected on July 29, 2011. These leaf samples will be used to evaluate the nutrient status of trees harvested in January, 2012. Collection of these was funded by a separate USDA grant, and not charged to SCBGP-FB11-06.
- The only task scheduled for the reporting period was pecan harvest. Harvest, which is usually completed in November and December, was delayed because of unusually wet weather, and was not done until January, 2012.
- The commercial partner in this project is Green Valley Pecan Company. They have given us complete access to the two orchards we are studying. In January 2011, they hedged the orchards, providing the array of hedged trees needed for our study (see Figure 1). They were responsible for all cultural management of the trees: pest control, irrigation, fertilization, etc.
- We have collected baseline data for the past two years, but harvest for the 2011 growing season was not completed until late January, 2012, so no new data were collected in the first quarter.

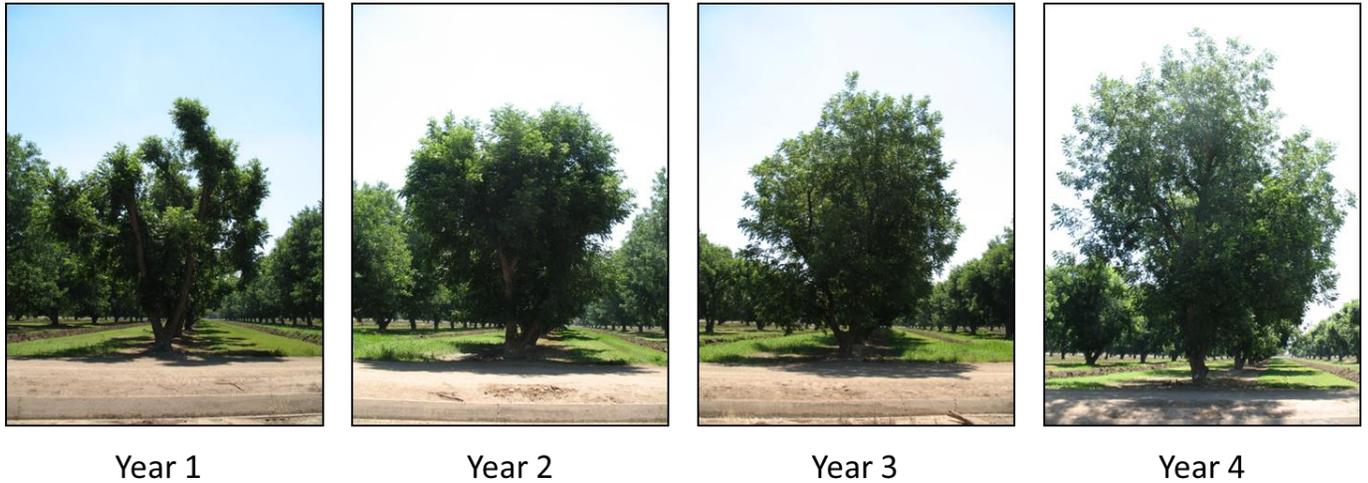


Figure 1. From left to right: trees hedged in January 2011, 2010, 2009, and 2008.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- Individual rows of pecans were harvested on January 12 (Wichita variety) and January 20 (Western Schley variety). Subsamples of nuts were collected, weighed, cleaned to remove soil, rocks, sticks, shucks, etc. 100 nuts were taken from each harvest row sample, and separated to determine percentages of stick-tights (nuts with shucks that do not separate from the nut shell) and pre-germinated nuts (nuts that have started to germinate prior to harvest), and percentages of marketable nuts. 50 nuts were taken from each harvest row and shelled to determine kernel percentage.
- Harvest data are presented below. As we have seen in the previous two years, nut yield generally increased with years following hedging. In Wichita, however the trees hedged three years ago yielded less than those hedged two years ago. The reason for this is unknown. The kernel percentage and the average nut weight usually reflected nut yield – as nut yield increases, kernel percentage and average nut weight decrease. This pattern was seen in Western Schley, but not in Wichita, where both kernel percentage and average nut weight were greatest in the third year following hedging.
- Percentages of sticktights and pre-germinated nuts were not clearly related to years following hedging in either variety.

years since hedging	Wichita				Western Schley			
	1	2	3	4	1	2	3	4
lbs of nuts/a	1616	2508	2297	3732	849	1474	2482	4191
% sticktights	0.4	1.1	0.7	1.1	1.8	1.4	2.7	1.6
% pre-germinated nuts	1.5	1.2	1.3	5.4	4.3	2.3	2.9	5.3
% kernel	62.0	62.7	66.5	60.5	57.8	57.2	53.3	46.8
average nut weight	7.15	6.90	7.25	6.50	6.1	5.6	5.3	4.9

Following harvest, one quarter of the trees were mechanically hedged and topped. The trees that had been hedged four years ago (January, 2008) were hedged in February, 1012, following the established hedging pattern. Trees have been fertilized and irrigated according to standard production practices.

Third Quarter (Apr. 2012 – June 2012) Activities:

- 2011 harvest data analysis were completed.
- An additional orchard block has been added to this project. A block adjacent to the block of Wichita pecans that we have been monitoring for four years has had a new hedging pattern applied. The orchard owner is switching this block to a three-year hedging pattern (as opposed to the four-year pattern in our blocks). Ultimately, we will study the three-year hedging pattern in addition to the four-year pattern we are now evaluating, although it will take three years for this pattern to be fully established. In the meantime, this block includes trees that were hedged five years ago, and we are including these rows in our study. We developed a plot plan for this new block, established tree counts, and developed a hedging pattern that will allow us to look at trees hedged six years ago in 2013.
- New plot plans were developed for the Wichita and Western Schley pecans in four-year hedging pattern. A new plot plan is needed each year because the trees that had gone one year since pruning in 2011 have now gone two years since pruning in 2012, etc.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- Leaf samples were collected from 5th year trees.
- All leaf samples were ground, prepared for analysis, and submitted to a commercial testing laboratory.
- Cumulative data from 2009 to date were standardized and assembled into a database for use in economic analyses.
- Bruce Caris, Director Sales and Marketing and Brenda Lara, Plant Manager of Green Valley Pecan were interviewed to evaluate the relationship between pecan nut quality, marketability, and price to build into an economic model to evaluate economic impacts of hedging pecans.
- Plots were visually inspected and crop development noted.
- On September 24 crop canopy measurements were taken with automated mobile sensors with Dr. Pedro Andrade Sanchez, Dept. of Ag. And Biosystems Engineering, UA. Information was collected on canopy architecture and light interception using Photosynthetically Active Radiation (PAR) sensors, plant-soil water status using a sensor suite consisting of a thermal IR gun, ambient temperature, humidity and wind speed sensors.

Problems and Delays

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- Nut harvest has been delayed by unusually high precipitation in December, and is a month later than expected. This delay required no action and the project targets are still realistic and attainable.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- Nut harvest was late, as noted in the previous quarterly report, but no additional delays or problems are reported.

Third Quarter (Apr. 2012 – June 2012) Activities:

- No delays or problems are reported.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- No delays or problems are reported.

Future Project Plans

- Plots will be marked for harvesting and harvest preparations will be made.
- Weather permitting, plots will be harvested in this quarter, samples collected and analysis started.
- No changes anticipated.

Funding Expended To Date

A total of \$9,910.41 has been expended as of September 30, 2012.

Maximizing Powdery Mildew Control on Melons

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- No activities on this project during this quarter.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- A cantaloupe planting containing two melon varieties of differing susceptibility to powdery mildew was seeded in mid-March. This planting will be used to conduct a fungicide trial beginning in May to evaluate fungicide efficacy in conjunction with genetic resistance to determine the most favorable treatment programs for powdery mildew.

Third Quarter (Apr. 2012 – June 2012) Activities:

- A cantaloupe planting was established containing a variety (PSS-2083) known to be susceptible to powdery mildew and another (Olympic Gold) thought to have some resistance to the disease. Treatments with various fungicides commenced May 15 and ended June 11. The appearance of powdery mildew in plots was first noted on May 31. Disease severity was assessed about one week after the last application of fungicides.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- Data from this trial were subjected to statistical analysis to determine significant differences in disease control among fungicides tested. When applied every 7-10 days during the time that powdery mildew was a threat, the fungicides Fontelis, Microthiol Disperss, Quintec, and Torino totally prevented development of disease on both the upper and lower leaf surfaces of treated plants genetically susceptible to powdery mildew. Other treatments that reduced disease on both leaf surfaces by at least 80% compared to nontreated plants included IKF-309, Luna Sensation alternated with Regalia, Merivon, Procure, Rally, and Topguard.

Problems and Delays

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- No activities on this project during this quarter.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- No unexpected delays, impediments or challenges were encountered.

Third Quarter (Apr. 2012 – June 2012) Activities:

- No unexpected delays, impediments or challenges were encountered.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- The original plan was to compare fungicide efficacy on a susceptible cantaloupe variety to one that possessed some genetic resistance to the disease. Unfortunately, the so-called resistant cantaloupe variety was as prone to powdery mildew as was the susceptible type. We plan to conduct another trial next spring, with another resistant cantaloupe selection.
- This project needs to be extended for an additional year to Sept, 2013. The reason for the extension is that a major goal of this research was to compare control of powdery mildew on melons using different fungicides on melons either genetically susceptible or genetically resistant to the disease. In the field trial concluded in 2012, the so-called resistant cultivar turned out to have disease severity similar to that of the susceptible cultivar. Therefore, I need to repeat the field trial using yet another resistant cultivar to achieve the original goal of this research. The timeline and future project plans are to be the same as that outlined in the original grant.

Future Project Plans

No activities on this project during the following quarter.

Funding Expended To Date

A total of \$3,063.84 has been expended as of September 30, 2012.

Risk Management for Farmers and Advisors

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- All first quarter activities were related to Objective 1.
- Dixon and Fournier continued work from previous SCBG related to identifying and correcting errors in the Arizona pesticide use data, and integrating information resources that we anticipate will be useful in the PRiME analysis.
- Nov 17. Conference call with UA and Oregon State University (OSU) project partners. We outlined the project steps and action items in more detail, based on grant objectives. We discussed plans and developed a schedule for a face to face meeting in Arizona in December to develop the methodological approach to analyzing Arizona pesticide use data using the PRiME (Pesticide Risk Mitigation Engine) system.

- Dixon & Fournier developed a dataset of all products / active ingredients (AIs) used on all types of AZ lettuce from January 1991 – October 2011 and forwarded to OSU partners for review.
- OSU partners reviewed data to verify that active ingredients used on AZ lettuce have toxicological profiles available and integrated into the PRiME database. These profiles are needed to develop the risk analyses. It was determined that nearly all products in our dataset already have toxicological profiles in PRiME. There was one key AI, mevinphos, for which these profiles were missing (6 products in the AZ pesticide use data with over 5,000 applications on hundreds of thousands of acres). We discussed the importance of adding these profiles to PRiME prior to risk analysis.
- Dec 13-14. UA and OSU project partners met in AZ for a series of productive technical discussions and identified the analytical approach we will take. We discussed a section-level analysis approach as well as a more refined approach that could serve as a proxy for field-level information, which are lacking in pesticide use reports. We identified the data fields from the AZ pesticide use database needed to support the PRiME analysis. The approach agreed upon is feasible yet novel for the PRiME tool. We consulted with a Canadian eco-toxicologist regarding the feasibility of the analysis, and he agreed that the approach we were pursuing was the most reasonable. He also provided related literature that used a similar analytic approach with a different kind of dataset (Mineau & Whiteshade 2006).
- Dixon generated the subset of data required for the section level analysis.
- Dixon & Fournier began review the dataset to identify and correct errors related to the product rate field.
- We are on track with the project goals as outlined on the timeline for the first quarter of this grant.
- Performance measures related to outcome 1 can be provided only after PRiME analyses are completed.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- Following the December meeting with our project partners from OSU, we compiled and began to refine the complete data set of lettuce records from 1991 – 2011 and all fields that will be required for analysis with the PRiME pesticide risk mitigation engine. This is comprised of over 500,000 individual application records.
- Dixon and Fournier invested a large portion of time on review and correction of data errors associated with lettuce records, but in some cases dealing with more systemic issues. For example, we did a detailed review of rate information for product applications on lettuce versus max label rate information obtained from Agrian and via look-up of labels for older products. Also, we uncovered problems with township range and section information associated with a small proportion of records and have made significant progress correcting some of these issues.
- We completed integration of new data fields needed to calculate pounds of active ingredient applied, which will be needed for the PRiME analysis.
- We provided a one-year subset of the data (complete and in final format, but with a small proportion of records that are still being examined for possible errors) to our OSU

partners to use as a test case to ensure our format and information provided are compatible for PRiME analysis.

- We maintained contact with our OSU project partners, including frequent phone calls and emails and also a face-to-face meeting with Paul Jepson in Memphis at the 7th International IPM Symposium where we discuss project details.
- We are on generally track with the project goals as outlined on the timeline for the first quarter of this grant.
- Performance measures related to outcome 1 can be provided only after PRiME analyses are completed.

Third Quarter (Apr. 2012 – June 2012) Activities:

- Continued evaluating and correcting township range and section (TRS) information on a portion of the lettuce records. This involved correcting county information, checking of TRS data against known agricultural areas, interactions with members of the APMC Pesticide Use Database advisory committee, growers and PCAs at the Desert Agriculture Conference. In addition, we placed many calls and emails to companies and PCAs to clarify and correct invalid TRS data.
- Worked in dialog with John Palumbo, PCAs and members of the advisory committee to get an improved estimate of Arizona lettuce acres needed for analysis.
- Held conference calls with all project partners on April 4 and June 26. Discussed data issues as well as billing issues for transfer of funds to OSU.
- Arizona lettuce data were finalized and forwarded to OSU partners for analysis using the PRiME Pesticide Risk Mitigation Engine in late May.
- Lettuce data set is by far the largest ever to be analyzed by the PRiME system, and includes over 470,000 applications. Programmer Michael Guzy at OSU reviewed the data and prepped for the analysis. This included updating the risk indices for some of the compounds included in the data.
- Al Fournier presented at Desert Agriculture Conference on May 3. Although analysis with the PRiME system had not yet occurred, time invested in rate corrections for all lettuce data and the updating of the database to enable calculation of pounds active ingredient (a.i.) applied and provided some interesting results to present. We developed charts and graphics based on the improved lettuce data set. Charts presented showed long-term insecticide trends (20+ years) that indicate dramatic reductions in broad-spectrum insecticide use. For example, comparing 1991-1995 v. 2009-2011, we noted the following reductions in pounds a.i. applied:
 - 55% reduction in pyrethroids, 90% reduction in carbamates, 93% reduction in organophosphates, 96% reduction in endosulfan
 - 88% reduction overall in broad spectrums
 - 82% reduction in all insecticide active ingredients
- In addition to presenting these data, we engaged growers and PCAs at our breakout session on some of the challenges we were facing with township, range and section data, and got some valuable input, prior to our Yuma advisory meeting.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- July & August: conferred with OSU partners on analysis plan and test analysis of AZ lettuce data using the PRiME system. Initially, batch analysis of data for individual years was conducted to work out potential problems with the full-scale analysis. This included iterative dialog and clarification of AZ data, as well as updating the PRiME database to include toxicology information for active ingredients included in AZ lettuce dataset that were previously unavailable in PRiME.
- Held conference call with OSU project partners on August 27 to discuss progress of analysis and plans for PRiME presentation at Yuma Preseason Vegetable meeting.
- Al Fournier presented at Yuma Preseason Vegetable meeting on August 30. The presentation included an explanation of PRiME as a decision-making tool for growers, and a summary of lettuce insecticide use patterns from 1991 – 2011. (The PRiME analysis was not complete at this time and so was not included.)
- Conducted an audience response survey at Yuma Preseason Vegetable meeting to determine changes in participant knowledge and interest in risk mitigation and PRiME. 38 people responded. 61% of participants indicated moderate increases and 8% indicated large increases in their knowledge of risk mitigation as a result of the presentation. 33% of participants indicated a moderate increase and 19% indicated a large increase in their interest in risk mitigation as a result of the presentation. 66% said they would consider using the PRiME system to evaluate and mitigate their agricultural pesticide risk and 18% said they would definitely use it.
- OSU partners analyzed AZ lettuce data using PRiME Pesticide Risk Mitigation Engine and delivered charts and summary analyses. These were reviewed and discussed over the phone and at a face-to-face meeting with Paul Jepson, Peter Ellsworth and Al Fournier on September 19.
- The preliminary analysis produced useful data on overall pesticide risk patterns from 1991 to 2011 and risk by active ingredient for each risk index (avian, inhalation, etc.). A general trend of significant risk reduction is evident. Further refinement of the analysis, additional analyses and interpretation of the data are ongoing.
- September 18 phone conference between Al Fournier, Wayne Dixon and Michael Guzy (OSU) to discuss initial results of PRiME analysis and to clarify questions about data variance. Discrepancies were found between the AZ data and the PRiME database for percent active ingredient for some products, which affected calculation of pounds active ingredient applied. A review of pesticide labels was conducted and corrections were made to both the AZ lettuce dataset and the PRiME database. Active ingredient codes were also check and cross-verified between our two databases, improving both. As a result of this call, a revised lettuce dataset was prepared by Wayne Dixon and submitted to OSU partners for further PRiME analysis.
- Interacted with Bruce Gwynn and the planning committee for the 2013 Southwest Ag Summit to schedule two presentations at the March 2012 conference, where Dr. Paul Jepson (OSU) will present results from the PRiME analysis of historical lettuce data.

Problems and Delays

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- No delays, impediments or modifications to workplan to note at this time.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- We fell short of our goal of delivering a complete, clean and verified lettuce data set to our OSU partners for PRiME analysis by the end of March. Correction of problematic Township, Range and Section data is continuing with completion scheduled for end of May.
- There has been some delay in transfer of funds to OSU for PRiME data analysis. It was determined that it will best to do this on an invoice basis.

Third Quarter (Apr. 2012 – June 2012) Activities:

- We invested significantly more time in data correction than anticipated, specifically, rate and location data for lettuce applications. This delayed delivery of the lettuce data set to OSU for analysis.
- We met our revised goal of delivering data to OSU partners for PRiME analysis before the end of May.
- We finalized the plan for billing UA for PRiME analysis services. Expect to invoice for these activities in the fourth quarter.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- We requested and received a no-cost extension for 3 months in late August. This was because of delays in finalizing AZ lettuce data for analysis as mentioned for last quarter, and to ensure adequate time for OSU data processing, interpretation and invoicing. The grant will now end 12/31/12.

Future Project Plans

- The stage is now set for subsequent analyses and interpretations of the data. The risk reduction trends shown in the preliminary analysis for each risk index by itself is insufficient for more complete understanding of the underlying trends. It would be helpful to start building up narratives for the history of IPM in lettuce over this period, the history of insect, disease, and weed pressures and the regulatory and new product introduction histories.
- We will continue to work on further refinement and interpretation of the data, including maps showing risk data trends and more detailed analysis by compound.

Funding Expended To Date

A total of \$35,050.42 has been expended as of September 30, 2012.

Literature Cited

Mineau, P. & M. Whiteshade. 2006. Lethal Risk to Birds from Insecticide Use in The United States, a Spatial and Temporal Analysis. *Environ. Toxicol. Chem.* 26, 2006.

RNA Vaccines against a Tomato Viroid

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

Planned activities for this period have been completely satisfactorily as detailed below:

- Designing primer for TCDVd detection and cloning: Two pairs of primers have been designed for detection and cloning. Both primer pairs amplified DNA products of the expected sizes. These primers were then used successfully in the detection of the TCDVd from greenhouse tomato samples.
- Biological characterization of Tomato chlorotic dwarf viroid (TCDVd): To determine the dynamic of TCDVd infection and if resistant tomato can be identified, we mechanically inoculated nine greenhouse tomato varieties with TCDVd and observed the detectable levels of TCDVd and symptoms over a period of 6 weeks. None of the test varieties displayed resistance to TCDVd, however, a couple of varieties showed a one-week delay in the detection of the viroid. Overall, TCDVd behaved as a slow virus, with viroid and symptoms being detectable at four to five weeks after inoculation.
- Cloning and sequencing of TCDVd: Full-length cDNA of TCDVd was amplified using the primers described above. The DNA fragment was subsequently cloned into a TA cloning vector. Six independent clones were sequenced subsequently. There is little sequence variation among the 361 nucleotides of the TCDVd genomes. Only one to two nucleotides varies among the six sequences obtained. Overall the sequence displayed over 99% sequence identity to the published TCDVd sequence. Partial DNA fragments from these clones will be used to design dsRNA for insertion into PepMV expression vector.

Second Quarter Jan. 2012 – March 2012) Activities:

- Construction of infectious cDNA for TCDVd: To verify if the cloned full-length cDNA is indeed the viroid that causes the tomato chlorotic dwarf disease, the dimer form of the viroid cDNA amplified by RT-PCR was inserted into a plasmid pBL-XcmTT by TA ligation. Six independent clones were obtained that had the expected dimeric TCDVd cDNA under the control of either T7 RNA polymerase promoter or T3 RNA polymerase promoter. These clones were digested with either restriction enzyme XhoI or XbaI, depending on the orientation of the cDNA insert. In vitro transcripts were made using the T7 or T3 RNA polymerase and have been inoculated on plants. Symptoms are being observed
- Design TCDVd dsRNA constructs: PCR primers were designed to amplify TCDVd in two short fragments that can be ligated into pBL-XcmTT vector to form an inverted repeat that consists of one half of the viroid sequence. Enzymatic digestion and gel electrophoresis of the resulting clones confirmed the inverted repeat of TCDVd cDNA and its ability to form dsRNA when transcripts are made from these clones. These cDNA inserts are to be cloned into an attenuated, Pepino mosaic virus (PepMV) expression vector.

Third Quarter (April 2012 – June 2012) Activities:

- Construct TCDVd inverted repeats: In order to produce dsRNA, inverted repeats of TCDVd genomic fragments have been constructed by digesting a dimer of TCDVd

cDNA with the restriction enzyme BamHI, ligation of the resulting three small fragments to produce various manifestations of TCDVd inverted repeats. None of the repeats produced this way contains the complete TCDVd genome. When transcribed into RNA or expressed from a viral vector, these inverted repeats produce dsRNA, a form of RNA molecule that trigger RNAi to destroy an infecting viroid RNA. A further PCR step with specifically designed primer was used to add a NcoI restriction site to the end of the repeats to facilitate the cloning of these repeats into a PepMV expression vector.

- Cloning of dsRNA constructs to a PepMV expression vector: A restriction NcoI restriction site was engineered in a PepMV expression vector, pPepMV-US1-1, immediately after the CP gene coding sequence. This was performed in a subclone pPepMV-US1-1-H3, which contains the 400 nucleotides from the 3' of PepMV genome. To clone the dsRNA inverted repeats to the expression vector, the subclone was first digested with NcoI restriction enzyme, and then ligated with NcoI-digested inverted repeats. To put the subclone back to the full-length infectious expression vector, pPepMV-US1-1, a PmlI-SmaI fragment from the subclone was used to replace the same fragment from the full-length clone. Since both the PmlI and the SmaI enzymes are blunt-end-producing enzymes, the ligation efficiency has caused a pause in the project.

Fourth Quarter (July 2012 – Sept 2012) Activities:

- As we encountered problems in cloning the dsRNA constructs into the infectious pPepMV-US1-1 expression vector, we continued to clone various DNA fragments into pPepMV-US1-1 expression vector. These fragments are simpler and smaller in size, and do not contain inverted repeats. They should be easier to clone into the expression vector. Also these fragments represent only a portion of the TCDVd genome, and their expression would not result in a viroid infection. Primers used to amplify these short fragments contain an NcoI sites. The amplified DNA fragments were first digested with NcoI restriction enzyme, and ligated into the subclone, pPepMV-US1-1-H3. Several attempts to bring the subclones back into the full-length expression vector, pPepMV-US1-1, have not been successful. Initial trouble shooting indicated the activity of the ligase used in these experiments may have been the cause. Additional ligation experiments are underway.
- The effect of the expression vector, pPepMV-US1-1, on tomato has also been evaluated. Plants carrying this viral vector exhibited identifiable symptoms on the inoculated leaves, but no apparent symptoms on other parts of the plants. Tomato plants inoculated with this vector has also been challenged with wild-type PepMV, most of the challenged plants did not display any symptoms and little or no viral RNA, indicating a level of protection conferred by pPepMV-US1-1. These experiments demonstrated that pPepMV-US1-1 is a suitable expression vector for the expression of RNA vaccine against TCDVd
- A poster describing our research on the characterization of TCDVd in Arizona and the construction of infectious cDNA clones for TCDVd was presented in the 2012 American Phytopathological Society annual meeting in Providence, RI in August 4-8, 2012. Over 1600 people attended the meeting.

Problems and Delays

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- No unexpected problem and delays have been encountered in this quarter.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- Most of the planned experiments were conducted in the quarter. However, due to the delay in the confirmation of the attenuated PepMV expression vector, the dsRNA constructs were not inserted into the vector yet, and expression levels of the dsRNA have not fully been assessed. The attenuated PepMV expression vector is now fully characterized. We expect dsRNA expression vectors will be constructed in the next quarter without any problems.

Third Quarter (April 2012 – June 2012) Activities:

- A problem in blunt-end ligation was encountered due to the complicated process of putting dsRNA-producing repeats into the PepMV expression vector, pPepMV-US1-1. Several repeated attempt to ligate the DNA fragments failed to produce sufficient number of colonies to screen for the correct clones. This has been determined to be a problem with both the ligation efficiency of blunt-end DNA fragments and a low transformation efficiency of the competent bacterial cells. A sufficient number of colonies can now be produced with commercially purchased competent cells. Colony-PCR is now being conducted to screen for the correct clones. However, this and the problem encountered last quarter have delayed the project significantly. We will submit a formal request for no-cost extension till June 2013.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- Ligation continues to be a problem during the introduction of TCDVd fragments into the viral expression vector in this quarter. However the problem appeared solved and should not impact the progress of the scheduled experiments.

Future Project Plans

To accommodate the problems encountered in the project, future activity plans have been modified. Depending on the progresses in future quarters, extension of the project may be requested in the third quarter.

Due to a problem encountered in the third quarter, we are now requesting an extension of project to May, 2013. Revised project plans are as follows:

- *Clone TCDVd dsRNA into PepMV vaccine vectors*
- *Result presentation at APS in Providence, RI*

Funding Expended To Date

A total of \$44,053.12 has been expended as of September 30, 2012.

Transgenic Vegetables for Fertilizer Use Efficiency

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- During the first quarter we completed two greenhouse studies with conventional romaine lettuce and two selections of romaine genetically modified using AVP1 35S. One study was an N experiment and one was a P experiment. We are currently analyzing these data.
- During this first quarter we initiated field studies with conventional romaine lettuce and two selections genetically modified romaine using AVP1 35S. We initiated one P experiment in October and one in November at the Maricopa Agricultural Center. We initiated one N experiment in November. We have harvested all these experiments and are analyzing the data.
- During the first quarter we have transformed two cultivars of iceberg lettuce using our AVP1 35S cassette. We have about 5 transgenic events for each cultivar. We are currently growing these T0 lines to seed in the greenhouse.

Second Quarter (Jan. 2012 – March 2012) Activities:

- We completed analytical and statistical analysis of greenhouse experiments with conventional and AVP1 modified romaine lettuce. We harvested all four field experiments with conventional and AVP1 modified romaine lettuce. We are analyzing the results from the field studies at present. We also collected plants in the field to produce seed for experiments next fall.
- We have grown out all our transgenic events of the T0 iceberg lines and collected T1 seed. We are screening this seed for phenotypic expression. After we make selections we will grow out T1 selections to produce T2 seed.
- We planted our selections of potato in the field for seed production. These will be harvested before June.
- We presented preliminary data collected in the project at the SW Ag. Summit on March 8. There were approximately 30 producers and crop advisors present. Because this project is in early stages we did not solicit feedback at this venue.

Third Quarter (April 2012 – June 2012) Activities:

- We harvested all seed from our romaine lettuce lines in the greenhouse and we harvested our potato seed increase in the field. We are cleaning and organizing our T1 iceberg lines for phenotypic screening.
- We showed these plots in a field day at the Maricopa Agricultural Center April 2, 2012. There were approximately 30 producers and crop advisors present. Because this project is in early stages we did not solicit feedback at this venue.

Fourth Quarter (July 2012 to September 2012) Activities:

- These data were presented at a workshop in Yuma. There were approximately 50 producers and crop advisors present at this meeting. We are prepared to initiate greenhouse and field studies in next quarter. Because this project is in early stages we did not solicit feedback at this venue.

Problems and Delays

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- There have been no problems and delays. We have secured our APHIS approvals for field testing of both lettuce and potato and are on schedule on all fronts. The development of our new iceberg transgenic lines is on schedule.

Second Quarter (Jan. 2012 – March 2012) Activities:

- No problems or delays.

Third Quarter (April 2012 – June 2012) Activities:

- During the third quarter I had my authorization to work with genetically modified organisms temporarily suspended due to non-compliance of greenhouse facilities. However, these shortcomings were quickly corrected and we remain on schedule.

Fourth Quarter (July 2012 to September 2012)

- Not much activity during this period and no delays.

Future Project Plans

We will complete selections of T1 iceberg lines and grow these selections to seed (T2 lines). We will again make selections and produce T3 inbred lines. We do not anticipate having T3 inbred lines for field testing until the winter of 2012.

We will resume field testing of conventional and genetically modified romaine lettuce lines in the fall.

We will collect our potato at harvest (in June) for seed which will be planted again late winter 2013.

We are currently modifying cantaloupes for AVP1 expression.

We will begin to actively solicit feedback in our outreach venues in order to evaluate performance.

Funding Expended To Date

A total of \$13,972.39 has been expended as of September 30, 2012.

Zinc Fertigation for Arizona Pecans

Activities Performed

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- The fertilizer injection system setup and testing, scheduled for January and February 2012, was actually completed in 2011, before the current funding cycle began. Figure 1 shows the experimental setup.
- Zn-EDTA treatments were applied throughout the 2011 growing season, again a year ahead of schedule.
- Leaf samples were collected on September 24, 2011 and analyzed for Zn content.

- Initial tree diameters were measured on May 11, 2011. Subsequent trunk diameter measurements were taken on September 26, 2011.
- The irrigation system was winterized to prevent freeze damage.

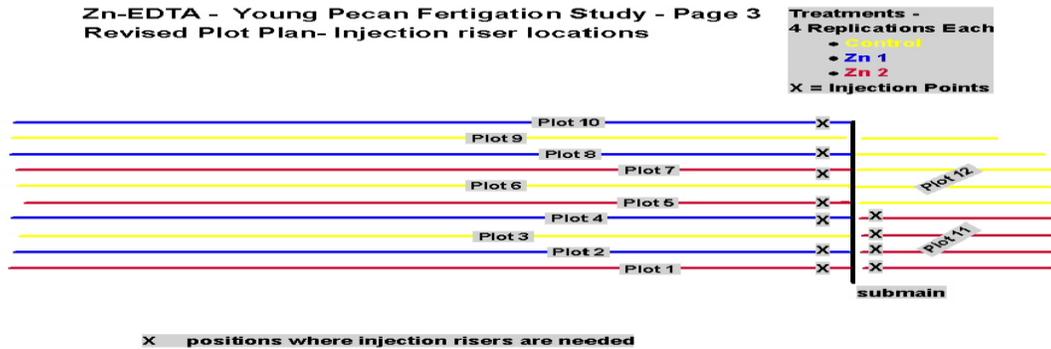


Figure 2. Plotplan for Zn fertigation study.

- All accomplishments scheduled for 2012 were completed in 2011 with funds separate from those provided by SCBGP. The entire project schedule will be moved forward one year, and we will collect three years of data rather than two. This is very advantageous because first year pecan tree response is extremely variable; subsequent growth and response are usually much more uniform (see Figure 2).



Figure 3. Two first year trees, the one on the left exhibiting very good growth, the one on the right healthy but growing slowly. This variability is typical of first year trees.

- Farmers Investment Corporation (FICO) provided trees and land for this project. They installed irrigation and provided irrigation injection equipment. FICO planted and maintained the trees, and scheduled and applied irrigation water. During January 2012 they replaced trees that died in 2011. Fertizona provided zinc fertilizer.
- Pecan tree growth in the first year after planting in the orchard is extremely variable, with some trees putting on considerable size, and other growing very little. Therefore, first year data must be interpreted with caution.
- Leaves from trees receiving no Zn (the control treatment) contained 16.4 ppm of Zn.
- Trees receiving 1 lb Zn/a contained 19.5 ppm Zn.
- Trees receiving 2 lb Zn/a contained 23.5 ppm Zn.
- The 2 lb Zn/a treatment was significantly different from the control, but not from the 1 lb Zn/a treatment.
- Our previous studies have indicated that approximately 30 ppm of foliar Zn are required to avoid Zn deficiency. It is hoped that in 2012 the leaf concentrations of the Zn-EDTA treated trees will increase to this level. If not, the application rates may be increased in 2013.
- No differences in growth in trunk diameter were noted in 2011.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- There was no activity in the second quarter, as trees were in winter dormancy.

Third Quarter (Apr. 2012 – June 2012) Activities:

- Injector pump and manifold were placed back in the field after winter storage.
- Injector manifold was repaired. Much of the plastic tubing in the manifold had to be replaced due to sun damage.
- Broken irrigation emitters were replaced or repaired.
- The injector system was calibrated twice.
- Zinc EDTA was injected on April 25, May 7 and 21, June 5, 13, 21, and 26.
- Additional field inspection trips were made on April 9 and May 22.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- Zinc EDTA was injected on July 8, August 3, August 23, and September 18.
- Leaf samples were collected on August 14, and analyzed for zinc content (Table 1).
- Trees were individually rated for severity of visible zinc deficiency symptoms on August 21 (Table 2), and data were statistically analyzed.
- Leaf chlorophyll content, stomatal conductance, photosynthesis rate, and intercellular CO₂ concentrations were measured on Wichita trees on August 21, and data were statistically analyzed with Dr. Richard Heerema, New Mexico State University (Table 3).
- Made a presentation on progress to date at the Arizona Pecan Growers annual meeting 21 (approximately 75 in attendance).

Table 1. Foliar zinc concentrations (ppm) on August 14, 2012. Numbers in each row followed by different letters are statistically different at the 95% confidence level.

Variety	No zinc	Low rate ZnEDTA	High rate ZnEDTA
Western Schley	12.7 b	21.6 ab	28.0 a
Wichita	9.6 c	18.6 b	25.3 a

Table 2. Visual zinc deficiency symptoms on August 14, 2012 (5 = no symptoms; 1 = severe symptoms). Numbers in each row followed by different letters are statistically different at the 95% confidence level.

Variety	No zinc	Low rate ZnEDTA	High rate ZnEDTA
Western Schley	4.1 b	4.4 a	4.3 b
Wichita	3.7 b	4.4 a	4.4 a

Table 3. Chlorophyll concentrations (SPAD units), photosynthesis ($\mu\text{mol CO}_2 \text{ m}^{-2} \text{ leaf area sec}^{-1}$), stomatal conductance ($\text{mol H}_2\text{O m}^{-2} \text{ leaf area sec}^{-1}$), and intercellular CO_2 concentrations ($\mu\text{mol CO}_2 \text{ mol}^{-1} \text{ air}$) in Wichita trees, August 14, 2012. Numbers in each row followed by different letters are statistically different at the 95% confidence level.

	No zinc	Low rate ZnEDTA	High rate ZnEDTA
Chlorophyll	34.6 b	37.6 a	38.1 a
Photosynthesis	12.8 b	15.0 a	16.3 a
Stomatal conductance	0.21 b	0.25 a	0.27 a
Intercellular CO_2 conc.	256 a	252 a	253 a

Data to date indicate that Zinc EDTA treatments are effectively supplying plant available zinc to the young pecan trees. Leaf zinc concentrations show that the higher rate of Zinc EDTA application is elevating foliar zinc levels more than the lower rate, although none of the foliar concentrations are yet at our target level (at least 30 ppm), and visual deficiency symptoms confirm that some zinc deficiency is still occurring in treated trees. Leaf chlorophyll concentrations, photosynthesis, and stomatal conductance all indicate that the untreated trees are adversely affected by zinc deficiency and that the treated trees are responding to applications of Zinc EDTA.

Problems and Delays

First Quarter (Oct. 2011 – Dec. 2011) Activities:

- There were no problems or delays.
- We are ahead of schedule and expect to exceed our targets.

Second Quarter (Jan. 2012 – Mar. 2012) Activities:

- No problems or delays are reported.

Third Quarter (Apr. 2012 – June 2012) Activities:

- Fertilizer injection system required some repairs and had to be re-calibrated to ensure accurate injection rates.

Fourth Quarter (July 2012 – Sept. 2012) Activities:

- No problems or delays were encountered in the fourth quarter.

Future Project Plans

- Complete 2012 Zinc EDTA applications.
- Measure tree diameters to monitor rate of growth
- Winterize fertilizer injection system.
- One presentation to pecan growers was delivered in September, 2012. Another will be made at the Western Nutrient Management Conference, March 7-8 in Reno, NV. A popular press article including results to date from this study has been submitted to Crops & Soils Magazine, and should be published in spring, 2013.
- The following timeline projects future activities.

Project activity	Who	Timeline
Fertilizer injection system renovation, repair, and testing	PI & Research specialist	February – March 2013
Zn-EDTA application made with each irrigation event	Research specialist & student	April – October 2013
Monthly plot observations, visual ratings	PI & Research specialist	April – October 2013
Foliar leaf sampling and analysis	Research specialist	August 2013
Photosynthesis measurements	Dr. Richard Heerema, NMSU	August 2013
Plant growth measurements	Research specialist	October 2013
Data analysis	PI & Research specialist	October – November 2013
Presentations at grower meetings	PI	March 2013
Preparation of manuscripts for a peer reviewed journal and a UA Cooperative Extension Bulletin	PI	November – December 2013

Funding Expended To Date

A total of \$3,905.44 has been expended as of September 30, 2012.

**2012 Southwest Ag Summit
Field Day & Breakout Session Speakers
March 7th and 8th, 2012**

1st DAY OF EVENT (March 7, 2012)

2012 Field Day for March 7th/Wednesday

7:00 AM Registration/Yuma Ag Center

8:00 AM to Noon **Field Demonstration Day**
Mark Siemens, Ph.D., Yuma Agricultural Center, University of Arizona and
Kurt Nolte, Ph.D., Yuma County Cooperative Extension, University of Arizona

Field Demonstrations

- Delta Plastics – Lay Flat Poly tubing for Furrow/Flood Irrigation
- Keithly-Williams Seeds – Cotton/Corn Planter
- Keithly-Williams Seeds – The RoboCrop Automated in-Row Weeder/Thinner
- Keithly-Williams Seeds – Williams Automated Transplanter
- Keithly-Williams Seeds – Kennco Mulch Retriever
- Empire Southwest LLC/Wilcox Ag Products – Solar Energy Demonstration
- Kurt Nolte, Yuma County Cooperative Extension – Spike Wheel Fertilizer Applicator
- Booth Machinery Inc. – Effects of Tillage on Soil Properties - Case IH Ecolo Tiger, 870 Disk Ripper, V-Ripper, 790 Disk, 165 Rollover Plow
- Dr. Mark Siemens, University of Arizona – Lettuce Thinner
- RDO Equipment Co. – John Deere 8360R Tier 4 Tractor with iGrade Leveling System
- SITECH Southwest – Trimble Autopilot with SVRS RTC Connection
- Bingham Equipment Co. – New Holland Ground Prep Tools
- Foothill Packing – Lettuce Thinner
- Green Leaf Technologies – Turbodrop Spray Nozzle Technology/Empire Spray Coupe
- Helena Chemical Company – Clyphosate herbicide Test
- KIFCO – Water Reel
- Gearmore – High Density Planter
- Northwest Tillers – 84” Mulcher/Bed Shaper

2nd DAY OF EVENT (March 8, 2012)

2012 Academic Speakers & Workshops for March 8th/Thursday (22 CCA Units, 11 CA/AZ PCA Units)

7:00 AM Late Registration and Refreshments/Pivot Point, Old Town Yuma

7:45 AM Opening Remarks – Steve Alameda YFVA, CAPCA Award
Dr. Shane Burgess, College of Agriculture, University of Arizona

8:15 AM **Morning Keynote** – Mike McCarty, President and CEO, Helena Chemical Company

“Pest Management Technologies Have a Bright Agricultural Future”
(0.5 CCA Units, 0.5 CA/AZ PCA Units)

9:15 AM Networking Break

Morning Breakout Sessions / 9:30 AM – 12:00 PM

PIVOT POINT – REDONDO ROOM

Morning Session: Breakout #1, Integrated Pest Management Regulatory Update (2 CCA Units, 2 CA/AZ PCA Units)

Moderator: John Palumbo, Entomology Department, University of Arizona

9:30 – 10:30 AM *California Legislative and Regulatory Update*
Renee Pinel, Western Plant Health Association

10:30 – 11:30 AM *Arizona Pesticide Regulatory Update*
Jack Peterson, AZ Dept of Agriculture

PIVOT POINT – SOUTHERN PACIFIC ROOM

Morning Session: Breakout #2, Fresh Produce Safety I (1.5 CCA Units)

Moderator: **Fatima Corona**, JV Farms

9:30 – 11:00 AM *Quality Standards and Sampling of Irrigation Water for Food Safety*

PIVOT POINT – ANZA ROOM

Morning Session: Breakout #3, Minimizing Pesticide Spray Drift with Advanced Nozzle Selection (1.5 CCA Units, 1.5 CA/AZ PCA Units)

9:30 – 11:00 AM *Advanced Nozzle Selection for Minimizing Pesticide Spray Drift in Desert Grown Crops*
Dr. Bill McCloskey, University of Arizona, **Dr. Pedro Andrade**, University of Arizona

HILTON GARDEN INN – YUMA ROOM (2 CCA Units)

Morning Session: Breakout #6, Alternative Crops and Technologies

Moderator: **Dr. Mark Siemens**, University of Arizona

9:30 – 10:00 AM *Wheeled Point Injection System for Improved Chemical Application*
Dr. Mark Siemens, University of Arizona

10:00 – 10:30 AM *Sunflower: An Alternative Crop in the Desert Southwest*
Ron Meyer, Colorado State University

10:30 – 11:00 AM *The Lettuce Ice and Freeze Forecasting Program*
Dr. Paul Brown, University of Arizona

10:00 – 10:30 AM *Irrigation and Nitrogen Management Web-Based Software for Lettuce Production*

Dr. Michael Cahn, University of California

HILTON GARDEN INN – CALIFORNIA ROOM (2 CCA Units)

Morning Session: Breakout #7, Fresh Approaches to Plant Nutrition and Fertilizers

Moderator: **Ayman Mostafa**, University of Arizona

- 9:30 – 10:00 AM *Understanding and Improving Phosphorus Fertilizer in SW Agriculture*
Dr. Terry Tindall, J.R. Simplot
- 10:00 – 10:30 AM *Fundamentals of Using Controlled Release Fertilizers*
Dr. Eric Ellison, Agrium Advanced Technologies, Inc.
- 10:30 – 11:00 AM *Seeking a Genetic Path for Improved Nutrient Use Efficiency*
Dr. Charles Sanchez, University of Arizona, **Dr. Roberto Gaxiola**, Arizona State University
- 10:00 – 10:30 AM *Algae: Fuel, Feed and Fertilizer*
Dr. Milton Sommerfield, Arizona State University

Noon to 1:30pm **LUNCH**

Afternoon Keynote – Howard Buffett, CEO, Howard G. Buffett Foundation

Afternoon Breakout Sessions / 1:30 PM – 3:30 PM

PIVOT POINT – REDONDO ROOM

Afternoon Session: Breakout #8, Integrated Pest Management in Vegetables (2 CCA Units, 2 CA/AZ PCA Units)

Moderator: John Palumbo, University of Arizona, Martin Reid, DuPont Crop Protection

- 1:30 – 2:00 PM *Sclerotinia Drop of Lettuce: Management Considerations for Next Season*
Dr. Mike Matheron, University of Arizona
- 2:00 – 2:30 PM *Update on Vegetable Disease Concerns for California and Arizona*
Dr. Steven Koike, University of California
- 2:30 – 3:00 PM *Demonstration of Herbicide Mode of Action with Time Lapse Photography*
Barry Tickes and Marco Pena, University of Arizona
- 3:00 – 3:30 PM *Effective Management of Powdery Mildew on Melons: Achievement and Sustainability*
Dr. Mike Matheron, University of Arizona

PIVOT POINT – SOUTHERN PACIFIC ROOM

Afternoon Workshop: Breakout #9, The Agronomic Professional Development Refresher (2 CCA Units)

- 1:30 – 1:50 PM *Basic Nutrient Management*

Dr. Sam Wang, University of Arizona

1:50 – 2:10 PM *Physical and Chemical Properties of Soil*
Shawna Loper, University of Arizona

2:10 – 2:30 PM *Introductory Plant Physiology*
Dr. Kurt Nolte, University of Arizona

2:30 – 3:00 PM *Tillage and Ground Preparation*

3:00 – 3:30 PM *Irrigation and Water Management*
Dr. Ed Martin, University of Arizona

PIVOT POINT – ANZA ROOM

Afternoon Session: Breakout #10, Agribusiness, Strategic Planning for the Future: An Interactive Panel Discussion

Moderator: Dr. George Seperich, Food Science and Agribusiness, Arizona State University

1:30 – 3:30 PM Gary Dyer, President and CEO, Farm Credit Southwest
Tim McCabe, President, Arizona Food Marketing Alliance

HILTON GARDEN INN – ARIZONA ROOM

Afternoon Session: Breakout #11, Fresh Produce Safety II (1 CCA Unit)

Moderator: Vicki Scott, Amigo Farms

1:30 – 2:00 PM *How to Effectively Communicate Food Safety Practices to Field Crews*
Dr. Bobby Torres, University of Arizona

2:00 – 2:30 PM *United Fresh Produce Association: Industry Update*
Mr. Barry Eisenberg, United Fresh Produce Association

2:30 – 3:00 PM *Agroterrorism: Potential Threats to the Agriculture Industry*
Melissa Kreitner, FBI Intelligence Analyst, WMD Operations Investigative Unit

3:00 – 3:30 PM *The Scat/Track Guidebook for Desert Animal Identification*
Kaylee Renick, University of Arizona

HILTON GARDEN INN – CALIFORNIA ROOM

Afternoon Session: Breakout #13, Crop and Irrigation Management (2 CCA Units)

Moderator: Dr. Mike Ottman, University of Arizona

1:30 – 2:00 PM *A Model for Efficient Season Long Sprinkler Irrigation in Vegetables*
Dr. Dawit Zerihun, Dr. Charles Sanchez, Dr. Kurt Nolte, University of Arizona

2:00 – 2:30 PM *Lettuce Breeding for Low Desert Environments*
Dr. Ryan Hayes, USDA Ag Research Service

2:30 – 3:00 PM *Soil Compaction in ‘Medjool’ Dates and its Effect on Root Growth and Fruit Yield*
Dr. Pedro Andrade, University of Arizona

3:00 – 3:30 PM *Growth Stages of Wheat: What They Mean to You*
Dr. Mike Ottman, University of Arizona

PIVOT POINT – COLORADO RIVER ROOM

Afternoon Session: Breakout #14, Agricultural Labor and Immigration Reform (1 CCA Units)

Moderator: Shelly A. Tunis, Attorney, Representing Yuma Fresh Vegetable Association

1:30 – 3:30 PM *Trends in the Agricultural Labor Market: Interactive Panel Discussion*

Immigration reform and stricter enforcement of current immigration laws could significantly boost labor costs for agricultural producers. Although the implications of future immigration reforms are highly uncertain, the most current information about the status of farmworkers is presented here.

H2-A Issues and US Department of Labor and US Immigration and Customs Enforcement Investigations of Agricultural Operations.

Monte B. Lake, Attorney, CJ Lake, LLC, Washington DC

Immigration Reform Efforts in Washington, DC and the States, and the Economics of Immigrant Agricultural Workers

Tamar Jacoby, President, ImmigrationWorks, Washington DC

2012 Southwest Ag Summit Survey

1. How would you describe your occupation? [Circle 1]
 - a. Equipment Dealer
 - b. Grower/Farm Company
 - c. Marketing/Sales
 - d. PCA/Chemical Rep.
 - e. Professional/Support Personnel
 - f. Seed Representative
 - g. University/Government Personnel
 - h. Water-related Personnel
 - i. Other _____
2. Does your occupation involve the melon or vegetable industry?
 - a. Yes
 - b. No
3. Did you attend the Field Demonstration at the Yuma Ag Center?
 - a. Yes
 - b. No
4. How has the SW Ag Summit affected your occupation? [Circle all that apply]
 - a. Obtained material about desert ag
 - b. Provided marketing opportunities
 - c. Obtained material about food safety
 - d. Developed networking opportunities
 - e. Gained continuing education credits
 - f. Other _____
5. How did you learn about the SW Ag Summit? [Circle all that apply]
 - a. Postcard/Flyer in mail
 - b. SW Ag Summit website
 - c. Email
 - d. Social Media
 - e. Newspaper article
 - f. Word of mouth
 - g. Other _____
6. How likely are you to share information you obtained from the SW Ag Summit with others? [Circle a number]

Less Likely					Very Likely
1	2	3	4	5	
7. If you share the information, with whom will you share it? [Circle all that apply]
 - a. Staff
 - b. Coworkers
 - c. Media
 - d. Friends/Family
8. Why did you attend the SW Ag Summit? [Circle all that apply]
 - a. Academic breakout sessions
 - b. Booth displays
 - c. Continuing Education Credits
 - d. Field Demonstration
 - e. Keynote addresses
 - f. Marketing opportunities
 - g. Networking opportunities
 - h. Other _____
9. What was the best part of the SW Ag Summit?
10. What part of the SW Ag Summit needs improvement?
11. What topics would you like to see at a future SW Ag Summit?



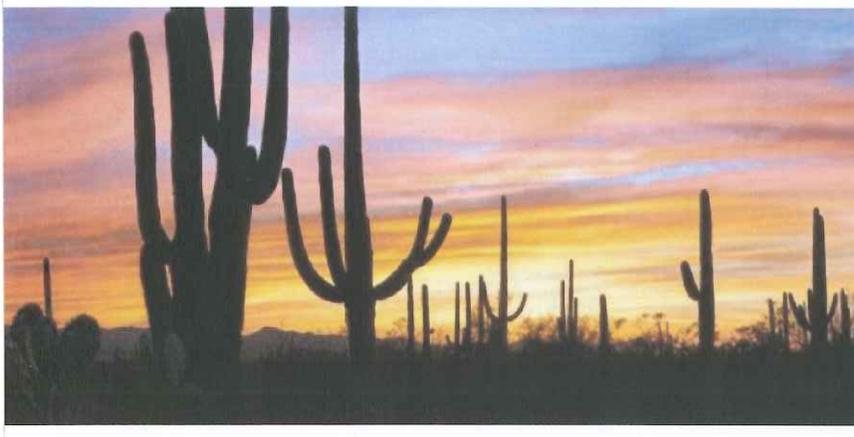
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ARIZONA GROWN Program Sprouts Roots Online

By | [Features](#)

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2012 September 1. Arizona Grown is growing thanks to the Arizona Department of Agriculture. Through a grant spearheaded by the Arizona Nursery Association and Western Growers and funded by the USDA Farm Bill to promote specialty crops, the 20-year-old Arizona Grown brand is making a comeback in the Arizona marketplace.

"Consumers are becoming obsessed with where their food comes from, which is why this is an ideal time to revitalize the Arizona Grown brand," said AnnaMarie Knorr, the Arizona government affairs manager for Western Growers. "Ultimately, this should be a tool for growers to connect with the consumers."

The same goes for locally grown plants, as the better quality and shorter shipping process only increase the appeal to budget-conscious consumers who want healthy plants.

The starting point of the Arizona Grown campaign was simple – to build a greater awareness surrounding the brand and logo, as well as to educate consumers on the benefits of buying local produce and plants.

Working with R&R Partners, the team determined that it would be most effective to focus the first phase online. Therefore, a new website was created to give consumers more educational information on why to buy local and how buying local helps the community, environment and our local economy. To help supplement Arizona Grown's online presence, the existing Facebook page was given a face-lift and now features daily content.

"Social media is social, which means the conversation needs to be constant, current and fun," said Linda Vojnoska, a senior account executive at R&R Partners. "We've incorporated engaging questions and are highlighting local restaurants, retail nurseries and farms and, ultimately, those who support local business and community."



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"All nurseries and vegetable farms that sell to the public should make sure they're taking advantage of this new marketing tool by engaging on Facebook, as well as Plant Something," said Cheryl Goar, executive director of the Arizona Nursery Association.

Knorr added, "Social media is quickly becoming one of the primary providers of information to the public. Through participation with Arizona produce growers, we can connect the farmers with buyers in the community and capitalize on the locally grown movement."

At the heart of the effort is interacting with local consumers who are interested in locally grown produce and plants.

"Consumers who are engaged go out of their way to buy a product they trust," said Brian Kunnari, a senior account executive with R&R Partners. "This is where Facebook goes from fun to a powerful business tool that works perfectly to enhance the Arizona Grown effort."

The success of this grant is measured by the amount of "likes" on the Arizona Grown Facebook page (an action that denotes someone is following the page). Before planned online advertising was underway in August, the fans of Arizona Grown's Facebook page had tripled simply by ensuring that there was fresh, daily content to come back and connect to. Online advertising across local websites and Facebook is scheduled to run from August through September and will highlight the daily content.

Plans for a phase two will come later this fall.

"We are excited to be able to enhance the Arizona Grown website and advertise it with the grant funds received in the second grant cycle," said Goar. "This will allow our members a greater opportunity to help consumers become familiar with the Arizona Grown brand and the information available on what is grown here and what to plant, as well as where to purchase Arizona Grown produce and plants."

All of these combined marketing efforts are great, but it ultimately comes down to one thing — ensuring that the Arizona logo can be found across the state.

"I encourage WG and ANA members to use the Arizona Grown logos on their plants and produce," said Goar. "If you are not currently doing so, instructions to obtain the artwork are also on the new Arizona Grown website at azgrown.com. I hope to see the logo blanketing all of our local retailers in the coming months!"

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