

COLLEGE OF AGRICULTURE AND LIFE SCIENCES

# Yuma Center of Excellence for Desert Agriculture

Annual Report | December 2016



Together We Are  
**MAKING A  
DIFFERENCE**

YCEDA is dedicated to bringing scientific research and industry together to find solutions that bring value to stakeholders by addressing “on-the-ground” needs of Desert Ag production.

*DesertAgSolutions.org*  
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Paul Brierley

## Executive Director's Report

I'm happy to report that the Yuma Center of Excellence for Desert Agriculture (YCEDA) is now two years old and going strong!

Our first year was spent defining the priority issues that our industry stakeholders want addressed and beating the bushes for potential projects to address them. These issues include production efficiencies through disease and water management, yield maximization and technology utilization. We are leveraging donor funds to forge alliances, initiate projects and bring in grant funding to have a much greater impact.

In 2016, we have partnered with UA, UC-Davis and international researchers; USDA laboratories and research centers; and many facets of industry - technology companies, UAV companies, data analytics companies, and more. We have solid projects with research underway on Fusarium wilt of lettuce, Irrigation and Salinity Management, Data Analytics for Disease Mitigation, Heavy Metals, Bird Deterrents and more. It is amazing how many of these projects are feeding off of each other in areas like soil health to produce even better results.

Our website, DesertAgSolutions.org, is being modernized and is becoming the go-to place for pertinent information, such as project results and research presentations. We get information out via conferences, presentations, social media, the press, radio and even television.

I sincerely thank our stakeholders for their continued support, trust and guidance. It has truly been a pleasure working with and for you. 2017 looks to be a banner year. We foresee usable results that will make a difference to your bottom line, and we will continue to engage with all aspects of industry and academia to bring resources to bear on the pressing issues facing Desert Agriculture.

YCEDA is truly a public-private partnership. Come join us. Together, we are making a difference!



## Precision Ag

### Applying Advanced Technology

YCEDA has undertaken a Technology Roadmapping Project with nMode Solutions, a wireless nano-sensor company. We are using a data-driven process to find user expectation gaps requiring technological solutions. Areas include: Real-time pathogen detection, Ag mechanization, Underground imaging/phenotyping, Wireless sensors, and Cloud communications/processing.

### Drones

YCEDA works to promote the development of unmanned aerial systems (UAS) solutions for the Desert Ag industry. These applications could be licensed for a private company to provide to industry, and UAV operators could be trained and certified. The Yuma Ag Center can be a perfect testbed for ground-truthing new UAS applications such as early detection of plant stressors.



## Food Safety

### Bird Deterrent Design Challenge

YCEDA teamed up with UA's Dr. Paula Rivadeneira's Food Safety Program to attack the problem of bird incursion leading to crop damage and food safety issues. YCEDA funded a Bird Deterrent Discussion and Design Challenge, to define the problem and incentivize creative solutions. Two Design Challenge winners were selected: a high tech drone-based system that detects and deters problem birds; and an engineering student with ideas for in-field deterrents.

### Heavy Metals Research

YCEDA and the Center for Produce Safety jointly funded a rapid response research project by UA's Dr. Charles Sanchez, "Expanded Sampling and Mitigation Strategy Evaluation for Cadmium in Desert Spinach." This project included high resolution soil sampling to assess in-field variability and development of sampling protocols that growers can use to predict the potential levels of cadmium in harvested spinach. Studies for evaluation of zinc fertilization as a potential strategy to reduce cadmium accumulations in leafy vegetable crops were also performed.





## ENHANCING PRODUCTIVITY BY FIGHTING PLANT DISEASE

### When It Comes to Productivity, Stakeholders Spoke Loud and Clear

They need help mitigating plant diseases that increase expenses and reduce yield. In 2015, YCEDA hosted the first-ever International Symposium on Fusarium Wilt of Lettuce and organized the first commercial field trials since 2002 to find solutions. Trial results, research presentations and more can be found at [DesertAgSolutions.org](http://DesertAgSolutions.org). As a result, industry and academia are working together in a unified effort to find solutions to this pressing problem. In 2016, we hosted a follow-up Fusarium conference in Monterey, conducted a second year of varietal and product field trials, obtained funding for additional Fusarium research, and partnered with a USDA national laboratory to better understand how to avoid the triggers that cause disease outbreaks in the first place.

### Advancing Management of Fusarium Wilt

A 2016 Fusarium conference for researchers and industry was held in the Salinas area to advance the priority suggestions from the 2015 symposium. Breakout sessions focused on future research projects and field evaluation of resistant varieties and crop protection products. Attendees were able to tour the area's lettuce industry and research institutions.

Meeting outcomes included a focus on short and long term research goals such as: annual field trials for germplasm and product evaluation; development of rapid soil, seed and tissue diagnostic tests; understanding the impact of cultural management practices and soil health; and working toward genetic resistance to the disease. These are to be accomplished by teams put together to apply for targeted grant funding.

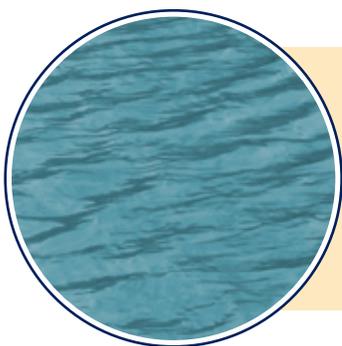
### New Fusarium Research and Trials

Nearly \$70,000 in funding was received from the Specialty Crop Block Grant Program. UA researchers Dr. Barry Pryor and Dr. Mike Matheron established trials within commercial fields to evaluate current lettuce varieties, experimental lines, fungicides and biofungicides for potential efficacy in managing Fusarium wilt of lettuce. Research is underway on early and remote detection to enable producers to better manage this devastating disease.

A 3-year multi-state research application to explore rapid soil diagnostics and year-round AZ/CA trials was not funded but will be resubmitted in 2017 with an expanded team to include soil health and other impactful areas.

### “CSI: Agriculture” – Identifying and Avoiding Disease Triggers

YCEDA underwrote a Roadmapping project with the USDA National Laboratory on Agriculture and the Environment and Earth Knowledge, an accomplished data analytics company. This roadmap has focused existing research, data, technology and predictive tools on the specialty crop industry. It has evolved to a collaboration with YCEDA growers providing historical and real-time data so that disease triggers can be analyzed and predicted. Cutting-edge sensors and other technology will be deployed to collect in-field data. Ultimately this research should provide a decision tool to help growers make agronomic decisions such as planting decisions, soil preparation, irrigation management, pesticide treatments, yield estimation, harvest timing and other production decisions that will maximize productivity and profits.



### Irrigation and Salinity Management

YCEDA is spearheading a multi-year project with UA's Dr. Charles Sanchez and Dr. Paul Brown and the USDA Arid Lands Agricultural Research Center's Dr. Andrew French to quantify irrigation, evaporation, water use and soil salinity during an annual cropping pattern. We will quantify the necessary leaching coefficient of irrigation along with updated evapotranspiration data, from which irrigation management applications will be developed.

# 2016 OUTREACH EFFORTS

## Collaboration on Issues, Technology, Economic Development and Entrepreneurship:

- Worked with Greater Yuma Economic Development Corporation, AZ Regional Economic Development Foundation, Arizona Commerce Authority and Tech Launch Arizona to promote Ag entrepreneurship and complementary industries such as food processing and Unmanned Aerial Systems
- Member of Western Growers Food Safety, Science & Technology Committee
- Participated in Forbes Ag Tech Summit
- Helped organized First Startup Weekend Yuma
- Promoted trade via Arizona District Export Council

## Presentations at:

- ACE Tour of foreign dignitaries
- Arizona Ag 100 Yuma Meeting
- Legislative Ag Tour
- AZ Rural Policy Forum
- AZ UAS Summit and Expo
- AZCPA Desert Ag Conference
- UA Yuma Pre-season Vegetable Workshop
- Western Growers Careers in Ag Program
- UA Yuma Citrus and Date Seminar
- AZ Crop Improvement Association



## Social and traditional media

## Center of Excellence Seminar Series



## “WHO BENEFITS”

The global desert agriculture industry benefits from University efforts that are more focused on solving their pressing issues. The University benefits from new resources made available by private funding and guidance of their efforts. The environment and world populations benefit from more efficient, sustainable and productive agricultural production in the 40% of the world where food is produced in arid lands.

## Yuma Center of Excellence Supporting Partners

- |  |                                   |                                 |
|--|-----------------------------------|---------------------------------|
| Amigo Farms                                  | <b>*Gowan Company</b>             | Pasquinelli Produce Co.         |
| <b>*Barkley Ag Enterprises, LLP</b>          | The Growers Company               | Patricia Ware Farms             |
| C&E Cattle Co.                               | Helena Chemical                   | Select Seed of Arizona          |
| Church Brothers Farms                        | <b>*JV Smith Companies</b>        | <b>*Smith Farms Co. of Yuma</b> |
| <b>*D'Arrigo Brothers Co., of California</b> | <b>*Keithly-Williams Seeds</b>    | SMT Farms & TFT Farms           |
| Duda Farm Fresh Foods                        | <b>*Martori Farms</b>             | Sunterra Farms                  |
| Farm Credit Services Southwest               | Mellon Farms                      | T & P Farms                     |
| Four Little Devils Farms                     | The Nunes Company/Foxy Vegetables | <b>*Tanimura &amp; Antle</b>    |
| Gila Valley Farms                            | Ocean Mist Farms                  | Taylor Farms                    |

(\*Advisory Council Member)



**DesertAgSolutions.org will have a new look and content in 2017!**