



THE UNIVERSITY OF ARIZONA

Yuma Center of Excellence for Desert Agriculture

DesertAgSolutions.org



2019 ANNUAL REPORT

FROM THE YCEDA EXECUTIVE DIRECTOR

Paul E. Brierley



I am excited to report that YCEDA has just completed five years of bringing solutions to the pressing problems faced by the Desert Ag production industry! This unique public-private partnership was a valiant experiment initiated by prominent members of the desert Ag industry and Dr. Shane Burgess, University of Arizona's Vice President for Agriculture, Life and Veterinary Sciences and Cooperative Extension, to allow the university to better serve this important industry. It's hard to believe that five years have passed already, and that so much has been accomplished in so little time. This was only possible through the active support and participation of our donors and other stakeholders, the University of Arizona, grower/cooperators, and researchers from multiple disciplines and institutions.

How have we managed to be so uniquely impactful?

1. We have grown from a single employee (me) to five professional staff focused on YCEDA and its projects.

Sonnet Nelson is our Program Coordinator, making everything run smoothly, keeping us on top of project requirements, and keeping our stakeholders looped in to our activities and results.

Rosa Bevington handles video production and social media, as well as piloting drones and processing remote sensing data.

Martin Porchas gives us on-the-ground capabilities such as field trials and sampling, as well as being our newest licensed drone pilot.

Dr. Stephanie Slinski is our Associate Director for Applied Research & Development. She works to engage and fund expert researchers on relevant topics, as well as developing projects to seek grant funding from more sources than ever.

2. We leverage donor funds by partnering with researchers to obtain external grant funding that puts them to work on the pressing problems our stakeholders face. To date we have brought in roughly \$2M above donor support, funding nearly \$4M of on-the-ground research efforts.

3. We have directly funded over \$100,000 of time-sensitive research projects with YCEDA funds. Our new seed funding program supports proof-of-concept research on new technologies, allowing us to partner with leading-edge researchers and help them obtain even larger grants to focus on our stakeholder issues.

4. We have built up a stable of drones and sensors to support research and applications that require these advanced capabilities.

5. We have put over 30 UArizona students to work on engineering design projects and internships such as



2013

- » YCEDA Public-Private Partnership established to provide a rapid response to the pressing problems of arid-land crop production

2014

- » Executive Director hired to launch YCEDA
- » YCEDA Advisory Council and donors identify initial priority issues:
 - Fusarium wilt of lettuce
 - Irrigation Management
 - Production Efficiencies & Yield Maximization
 - Ag Tech

2015

- » Convened International Symposium on Fusarium wilt of lettuce
- » Annual Fusarium wilt of lettuce field trials begin
- » Funded Center for Produce Safety rapid response project on heavy metals uptake

2016

- » Senior Program Coordinator hired
- » Irrigation & Soil Salinity Management project begins
- » Revamped YCEDA website provides a full-featured, go-to resource for the desert Ag industry

CELEBRATING 5 YEARS

OF INNOVATION, COLLABORATION & SOLUTIONS

ground-truthing of satellite thermal imaging and automated date pollination utilizing drone technology – leading to a high-tech startup company getting ready to provide services to the industry.

6. Private corporations have funded research efforts that allow us to engage researchers on topics like Nitrogen Management and Water Footprint of Durum wheat.

7. We have partnered with the Western Growers Association to evaluate new technologies and support AgTech startups applying Silicon Valley technology to agricultural needs.

What has this meant in terms of usable results?

8. Our biggest project has been to support UArizona, USDA and NASA researchers precisely quantifying crop water use and the effects on soil salinity of most major desert cropping systems – leading to some surprises that will impact crop rotation and irrigation decisions. Ultimately, irrigation

management apps will be able to use satellite data to provide crop-specific recommendations.

9. Another focus has been mitigation of Fusarium wilt of lettuce, and the associated need to enhance soil health to suppress soilborne disease. Four years of field trials, greenhouse trials, and molecular diagnostic tool development have given promising results as the industry tries to manage this debilitating disease.

10. Food Safety for fresh produce is another critical area we have worked to bring solutions to. We have funded the evaluation of a real-time pathogen detection biosensor which could have practical application monitoring water supplies in the field and in the processing plant; and we are funding a study of how soil microbial communities are impacted by new water treatment requirements. In addition, we continue to try to help the industry understand the impact of food safety threats beyond irrigation water.

Check out DesertAgSolutions.org and our social media pages to get more detailed information. We have archived not only research results, but also seminars and presentations, project updates, impact videos, and much more. It's a great resource for anyone working in the industry!

There will never be a shortage of production challenges that need addressing. At YCEDA, we believe there need not be a shortage of answers either. As our capabilities continue to expand and we innovatively engage more researchers on more challenges, we see a bright future for YCEDA and for the Desert Ag industry that we support.

I am honored and thrilled to be YCEDA's Executive Director. I look back fondly on our first five years and I look forward with great optimism to taking us even further in the next five years.



- » Media Specialist/Drone Pilot hired
- » YCEDA Drone Program established to provide remote sensing equipment, data processing, and support for research projects
- » Development of automated date pollination system begins
- » Pursued additional high-priority issues identified by YCEDA stakeholders:
 - Soil Health
 - Food Safety
- » Obtained grant funding to purchase three Eddy Covariance (ECV) systems and one Large Aperture Scintillometry (LAS) system to augment the scientific capacity of irrigation and salinity management research projects

- » Senior Farm Attendant hired to support local research
- » Collaborated with UArizona's College of Engineering, McGuire Center for Entrepreneurship, and Tech Launch Arizona leading to a start-up company providing automated drone pollination to the date industry
- » Joined with UArizona and Texas A&M researchers on a \$4.4M project to improve the safety and quality of melons
- » Associate Director of Applied Research and Development hired to develop new research partnerships and projects to advance knowledge on crop disease, soil health, & food safety

- » Launched YCEDA Seed Funding Program. To date, it has funded proof-of-concepts in real-time pathogen detection and digital agriculture innovations
- » Partnered with Western Growers Association on a field evaluation of soil moisture sensor technologies
- » Initiated two UArizona research projects sponsored by Barilla Pasta to support Durum wheat sustainability
- » Enhanced Fusarium wilt of lettuce research efforts now include greenhouse work and expanded field trials with pre-commercial varieties, experimental crop protection products, head-to-head commercial variety comparisons, and cultural practices such as biosolarization and biofumigation

Continue providing new tools and solutions to the Desert Ag industry!

RESEARCH AND DEVELOPMENT INSIGHTS

Dr. Stephanie Slinski



Over the past year at YCEDA I have been learning about desert agriculture and developing a strategy for how to best address the pressing challenges of the industry. Since industry needs will change over time, it was important for me to develop a program that can quickly adapt to these changes and address both near-term and future needs. My goal is to develop a system to support research, develop a network of collaborators both within the University of Arizona and among other research institutions and regions, and to secure funding for new and important research projects.

We are able to support research by having staff that is available to help implement field trials, conduct field evaluations, collect and ship samples, and collect data using YCEDA's drones and sensors. This reduces the travel required for researchers from outside of the desert agricultural region to conduct research.

YCEDA is also able to support funding directly through our new seed funding program. This program has helped support several projects integrating the use of technology to aid production management and projects in the area of food safety. These projects may not otherwise have found funding and we are excited to be able to provide an opening for researchers to start gathering data towards larger projects that may provide important knowledge or tools for the desert agriculture industry.

I am working to build new collaborations in Arizona and in other regions towards the development of new research or the expansion of current research. To advance these new collaborations, YCEDA has hosted three field tours introducing researchers to desert agriculture. These tours foster enthusiasm for agricultural research, help develop new relationships with potential industry cooperators, and

enable researchers to better understand agricultural operations. We also have been funded to host a project development workshop for which we will bring together researchers from many regions to develop projects addressing the needs of the desert leafy greens industry.

In 2019, YCEDA has had some projects funded addressing current research needs including the continuation of Fusarium wilt of lettuce field trials. The goals of these trials are to support the development of resistant lettuce varieties, evaluate crop protection products, and compare the performance of commercial varieties in a high disease pressure field. We are also evaluating methods to quantify pathogen inoculum in soil and methods to reduce soil inoculum levels. We have submitted a grant application for additional Fusarium wilt studies for 2020 with new collaborative partners from California, Arizona, and Florida.

Other projects are being developed to address near-term research needs for different commodities including date palms and citrus. YCEDA's citrus and date work also involves the use of UAS technology. New citrus work, for example, will evaluate the use of UAS-collected data to help monitor and manage an important disease.

We must also have long-term research objectives. Advancing projects to develop new decision-making tools using sensor technology and "big-data" is one of our goals. Soil health is another critical issue, and we are working to form collaborations with researchers who can establish management recommendations to improve desert soil health to maintain productivity into the future.

We will continue to refine project goals and research priorities throughout the next year based on stakeholder needs. Our network of collaborators is expanding, and we will have some exciting new projects starting in 2020.

AMIGO FARMS

**BARKLEY AG ENTERPRISES, LLC*

CHURCH BROTHERS FARMS

**D'ARRIGO BROTHERS CO., of CALIFORNIA*

DUDA FARM FRESH FOODS

FARM CREDIT WEST

FOUR LITTLE DEVILS FARMS

GILA VALLEY FARMS

**GOWAN COMPANY*

THE GROWERS COMPANY

**JV SMITH COMPANIES*

**KEITHLY-WILLIAMS SEEDS*

**MARTORI FARMS*

MELLON FARMS

THE NUNES COMPANY/FOXY VEGETABLES

NUTRIEN AG SOLUTIONS, INC.

OCEAN MIST FARMS

PASQUINELLI PRODUCE CO.

**SMITH FARMS COMPANY OF YUMA*

SMT FARMS & TFT FARMS

T&P FARMS

**TANIMURA & ANTLE*



TAYLOR FARMS

**Advisory Council Member*

YCEDA PARTNERS

 @YCEDA  @YCEDA_DesertAg  YCEDA

CONNECT WITH US

 928.782.5873  6425 W. 8th St. Yuma, AZ 85364  DesertAgSolutions.org