2020 ANNUAL REPORT

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

THE UNIVERSITY OF ARIZONA
Yuma Center of Excellence for Desert Agriculture
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I want to start with a great big thank you to our donors and stakeholders. While 2020 was not a year that anyone would have wished for, it was also a year that everyone involved with growing and putting food on the table should be very, very proud of. Unlike a lot of industries, you didn’t retreat to a home office or find yourselves with extra time to pursue at a hobby. You put your heads down against all the new challenges on top of the ones you have always faced and did what you always do: provide the world’s most plentiful, safest and nutritious food.

Against all the new challenges on top of your own, you didn’t retreat to a home office or find yourselves with extra time to pursue a hobby. You put your heads down against all the new challenges on top of the ones you have always faced and did what you always do: provide the world’s most plentiful, safest and nutritious food.

you and your fellow citizens without missing a beat. Kudos to you and THANK you for all that you did in 2020 — we will all remember.

Here at YCEDA, we put our heads down in 2020 to respond alongside you to new challenges of two kinds: the ongoing mission of solving your most pressing problems as a new normal, while continuing and expanding our work on irrigation and salinity management, Fusarium wilt, food safety, AgTech including drones, remote sensing and broadband connectivity, and also responded to the global pandemic in a very unique way. Building off a special donation from Jesus Tovar of T&P Farms, we purchased $775,000 from Yuma County and the State of Arizona to equip and staff a wastewater-based epidemiology laboratory to provide new diagnoses and COVID infections through wastewater detection. This and other new research are a valued resource to help municipal and public health officials keep the community safe for our agricultural relationship.

We can only respond to unexpected threats like this because we are a donor-funded and donor-focused organization. This public-private partnership. Created to be uniquely responsive to our needs and impactful with usable results, our story is one of growth and impact. Your donations directly support our work, and we look to you to inform us about your most pressing needs and work alongside us so that we can continue to help growers and scientists can immediately be put to use by you.

While we exist solely on private donations, we receive extraordinary-in-kind infrastructure support from the University of Arizona. Donor funds pay our professional staff and operating costs, which are leveraged many times over to provide maximum impact to the desert agriculture industry. In short, we couldn’t do what we do without your donors. Our growing donor base is a testament to our successes.

How are your dollars utilized?

• Employing professional staff that is at our disposal, focused solely on ascertaining industry needs, partnering for maximal impact, and moving faster than other university entities. Our staff has grown from one to nine with expertise in project management, grant writing, field research, crop production, environmental biology, remote sensing, lab operations, outreach and media production, and human health. Over half of our staff are grant-funded, greatly leveraging donated funds. In 2020 we added our first visiting researcher, an expert in utilizing wastewater-based epidemiology to mitigate COVID-19 community spread who has put YCEDA at the forefront of this emerging field.

• Our Small Grants Program has leveraged hundreds of dollars to solve food safety, water quality, soil health, food use, remote sensing and other issues. Many are addressing desert agriculture issues for the first time, with research enabled by YCEDA staff. The University of Arizona College of Agriculture and Life Sciences provides administrative and overhead support and also matches many of our grants, doubling our effectiveness. Our hope is that these projects lead to future applications for funding from external sources.

What are some of the usable results?

• Six years of Fusarium wilt of lettuce field trials have shown which breeding lines, pre-commercial and commercial varieties are resistant, and what products or cultural practices such as bio-fumigation, bio-solarization, or increasing soil health are most effective. In the future, this work is done quickly, efficiently, and with specific tangible outputs. It also means we can get the best experts to respond quickly when needed and only as long as needed, to respond quickly to industry needs while facilitating longer-term research collaborations.

• A 5-year multimillion-dollar project has utilized in-field sensing, drones, and satellite imaging to measure precise crop water use and soil salting for over a dozen crops, including lettuce, tomatoes, and watermelon. This study is being developed to allow producers to manage irrigation and track soil salinity. This will lead to new efficiencies and crop rotations, improve soil health and help preserve water rights in the policy arena.

• Food safety efforts include evaluation of a Real-time Pathogen detection biosensor, supporting water quality research, and partnering with the National Center for Innovation and Technology and the Center for Produce Sanitation to accelerate development of innovative additional tools available to avoid foodborne outbreaks is a necessary game changer for the industry.

• We are facilitating adoption and utilization of AgTech, from drone imaging and labor automation to working towards reliable in-field broadband data coverage.

• We sponsor undergraduate and graduate student teams and support their transition into startup businesses offering needed services to the Ag industry.

• YCEDA responded immediately to the COVID-19 pandemic by providing the Yuma community and especially its agriculture workforce and jobs with early warning COVID wastewater testing. Our work has prevented outbreaks at a large lettuce growing plant and a college dormitory. It has saved human lives, hundreds of jobs, millions of dollars and gained positive national political and media attention for the agriculture industry. It has also attracted a national expert researcher and funded a molecular biology laboratory that will be used for future research.

• With a strong website and social and traditional media presence, YCEDA is becoming the go-to source for research information, project results and media interviews, as well as getting the right message to the public on key issues.

As I look back at 2020, I am proud of our industry, our staff pleased to have helped you and proud of YCEDA. Through a (hopefully) once-in-a-lifetime pandemic, we have faced down the threats and come through even stronger. Know that we stand before you to put all available resources to work on the challenges that you face. I sincerely thank you for your continued support and collaboration. I know there is nothing that we can’t overcome. Together.

Paul E. Brierley
YCEDA Executive Director

We received funding to conduct a FWOL population study with Dr. Jim Correll (University of Arkansas). This study will tell us if there are multiple races of Fusarium oxysporum f. sp. lactucae in Arizona, and if there is diversity correlated to disease severity. YCEDA is collecting bacterial strains from the Yuma region during the 2020-2021 growing season and Dr. Correll will evaluate the samples. We are working to secure funding to extend this study including California samples.

Other Research

We are also engaging scientists and building new research programs. We have project in development that we hope to see funded in 2021 including one on soil health led by Dr. Sony Blankenship (Yuma). This project would complement our FWOL program since the soil is the most effective way to avoid the devastating impact of Fusarium biological soil disinfection, a method of soil disinfestation which combines solarization and anaerobic soil disinfection. This has been shown to be very effective against Fusarium species, and it can be longer lasting than solarization alone. In our pilot study we saw promising results, and we recently started collaborating with Jim Stapleton (University of California), an expert in bio-solarization, to help determine if this technique is feasible for growers in desert growing regions. This approach may be used as an effective and economical method of reducing crop loss.

Dr. Stephanie Slinski
YCEDA Associate Director
Applied Research & Development

We had a very productive year despite the challenges of 2020. Field trials were completed, several successful new collaborations were developed, and new research projects are planned for 2021 and beyond.

Fusarium wilt of lettuce (FWOL) is a growing problem in Arizona and California and a priority for YCEDA. We planted two fields in 2020 with Fusarium-resistant lettuce and romaine cultivars and hosted a field day to allow growers to observe the performance of these cultivars to help with their planting decisions. Robert Masson (Yuma County Cooperative Extension) has been instrumental as we assisted with trials to evaluate pre-commercial cultivars from private breeders and universities in order to determine the process leading to the release of new cultivars for the grower community. We look forward to working with new growers who are interested in helping to solve problems for this disease, the sooner we will have necessary recommendations for growers.

Because new resistant cultivars are needed to prevent or reduce losses from FWOL, we are working with Dr. Richard Michelmore (UC Davis) and Dr. Germán Stapleton (University of Arizona) to advance their breeding program. Last year we developed more than fifty of their breeding lines and cultivars in our trials. By supporting these programs, we hope to speed up the release of new cultivars to growers and new breeding material to growers who have been approved for research projects. Almost all of the research funds received in 2020 support these efforts.

We look forward to continuing to address the needs of the desert agriculture industry through collaborative research over the next year.

Dr. Stephanie Slinski
YCEDA Associate Director
Applied Research & Development
we received extraordinary in-kind infrastructure support from the University of Arizona. Donor funds pay our professional staff and operating costs, which are leveraged many times over to provide maximum impact to the desert agriculture industry. In short, we couldn’t do what we do without our donors. Our growing donor base is a testament to our successes. How are your dollars utilized? • Employing professional staff that is at our disposal, focused solely on ascertaining industry needs, partnering for maximal impact, and moving faster than other university entities. Our staff has grown from one to nine with expertise in project management, grant writing, field research, crop production, environmental biology, remote sensing, lab operations, outreach and media production, and human health. Over half of our staff are grant-funded, greatly leveraging donated funds. In 2020 we added our first Visiting Researcher, an expert in utilizing wastewater-based epidemiology to mitigate the process leading to the release of new virulent and resistant biotypes to growers. We look forward to working with increased funding in the future to help people helping to develop solutions for this disease, the sooner we will have recommendations for growers. What are some of the usable results? • Six years of Fusarium wilt of lettuce field trials have shown which breeding lines, pre-commercial and commercial varieties are resistant, and what products or cultural practices such as bio-fumigation, bio-solarization, or increasing soil health led by Dr. Joey Blankinship (UArizona). This project would accelerate food safety technology. Making farms safer from COVID-19 to growers. We look forward to working with increased funding in the future to help people helping to develop solutions for this disease, the sooner we will have recommendations for growers. Because new resistant cultivars are needed to replace the current varieties used, we are working with Dr. Richard Michelson (UC Davis) and Dr. Carmen Sandoya (University of Florida) to advance their breeding programs this year. We also plan to support new products and technologies that can help reduce disease pressure in the future. FUSARIUM WILT OF LETTUCE We had a very productive year despite the challenges of 2020. Field trials were completed, new collaborations were developed, and new research projects are planned for 2021 and beyond. Fusarium wilt of lettuce (FWOL) is a growing problem in Arizona and California and a priority for YCEDA. We planted two fields to evaluate new lettuce varieties, including wild and romaine cultivars and hosted a field day to allow growers to observe the performance of these cultivars with help from their planting decisions. Robert Masson (YCEDA) and others provided support by assisting with trials to evaluate pre-commercial cultivars from private breeding programs, and Fusarium (FWOL) pathogens. This work helped accelerate the process leading to the release of new virulent and resistant biotypes to growers. We look forward to working with increased funding in the future to help people helping to develop solutions for this disease, the sooner we will have recommendations for growers. We received funding to conduct a FWOL population study with Dr. Jim Correll (University of Arkansas). This study will help us if there are multiple races of Fusarium oxysporum f. sp. lagenarium in Arizona, and if there is diversity correlated to disease severity. YCEDA is collecting field samples from the Yuma region during the 2020-2021 growing season and Dr. Correll will evaluate the samples. We are working to secure funding to expand this study to include California samples. Other Research We are also engaging scientists and building new research programs. We have projects in development that we hope to see funded in 2021 including one on soil health led by Dr. Joy Blankinship (University of Arizona). This project would address the need for public-private partnerships to solve problems impacting local agriculture and help suppress disease. I am also facilitating the development of projects to assist date and citrus growers. I encourage industry stakeholders to contact me to discuss concerns that I can help address. I look forward to continuing to address the trends of the desert agriculture industry through collaborative research over the next year. • Our Small Grants Program has been awarded research projects. Almost all research takes place in grower cooperator fields, ensuring it applies directly and unequivocally to your real-world bottom line. • Top nationwide university and private sector researchers in crop disease, water management, soil health, remote sensing, food safety and other specialties have incorporated Yuma into their research programs thanks to our outreach and collaboration. • Our Small Grants Program has funded research to solve food safety, water quality, soil health, water use, remote sensing and other issues. Many are addressing desert agriculture issues for the first time, with remote research enabled by YCEDA. The University of Arizona College of Agriculture and Life Sciences provides administrative and overhead support and also matches many of our grants, doubling our effectiveness. Our hope is that these projects lead to future applications for funding from external sources. How are donor dollars leveraged for maximum impact? YCEDA is a donor-funded and donor-focused organization to equip and staff our agricultural workforce. Donors have been critical to our work, and we look to you to inform us about your most pressing needs and work alongside us so that we can respond quickly to industry needs and scale-up our efforts. We see it as our role to do the work and leverage your dollars to maximum impact. We are only able to respond to current needs and existing priorities, and we do not have the resources to address every need or project that is presented to us. We prioritize projects that align with current needs and existing priorities. We also prioritize projects that have the potential for impact and are feasible within our resources and limitations. We work with our partners, stakeholders, and industry to identify and prioritize needs, and we work with our partners and stakeholders to develop and implement projects that address those needs. We provide funding and support to projects that align with our mission and priorities. We evaluate projects and determine their feasibility and potential impact before providing funding or support. We also work with our partners and stakeholders to identify potential funding opportunities and leverage those opportunities to support our work. We work with our partners and stakeholders to identify potential funding opportunities and leverage those opportunities to support our work. We also provide technical assistance and expertise to our partners and stakeholders to support their work. We work with our partners and stakeholders to identify potential funding opportunities and leverage those opportunities to support our work. We also provide technical assistance and expertise to our partners and stakeholders to support their work.
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