

INSIDE TREC



Fall 2023

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From the Desk of the Director

How quickly the year has flown by and as 2023 draws to a close it provides a golden opportunity to reflect on some of our accomplishments of which there were many. While space does not permit me to enumerate them all, or to give full credit to all involved, it is worth noting our successful fund-raising event, *One Night in the Tropics*, once again saw more than 300 people in attendance who generously supported our cause for advancing scientific knowledge that improve the lives of the members of our agriculture and natural resources community. We firmly believe that research makes a difference in the world, and our outstanding faculty, students, and staff do their utmost best to discover and share new knowledge. But more importantly, our stakeholders have shown once again that they believe in us and have put “their money where their mouths are” so to speak. This symbiotic relationship rests on the fact that we need the support of our stakeholders, and our stakeholders need our support, given the myriad of challenges they are facing.

Take for instance the work being done by one of our upcoming talented junior faculty members, Dr. Alexandra Revynthi, who is in charge of the Ornamental Entomology & Acarology Lab at UF/IFAS Tropical Research and Education Center. The lab develops Integrated Pest Management tools to mitigate invasive pests plaguing the ornamental industry. The year 2023 has been particularly

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You may forward any questions or comments about this periodical to Monique Scoggin, mis6664@ufl.edu.

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From the Desk of the Director (continued)

challenging for the ornamental industry, the largest agricultural industry in Miami-Dade County. The detection and rapid expansion of the new invasive pest, *Thrips parvispinus*, caused significant losses and increased production costs dramatically. Dr. Revynthi and her research team, with the support of the Florida Farm Bureau, Dade County (Mr. Barney Rutzke, Jr., President); FNGLA Miami-Dade Chapter (Mr. Jeff DeMott, President); and several ornamental growers, responded immediately to this threat by conducting research on the efficacy of registered chemical insecticides against this pest. This information was shared with the industry and helped growers navigate chemical control applications in a more efficient manner.

Unfortunately, *T. parvispinus* is not the only pest that poses a threat to the ornamental industry. The hibiscus bud weevil (HBW) continues to threaten hibiscus production in south Florida. During 2023, Dr.



Revynthi and her team published the latest research on the chemical control of this pest. In addition, they identified the best entomopathogenic nematodes, fungi, and bacteria that can be used as biological control agents to mitigate the HBW. The effect of sanitation (collection and destruction of infested flower buds) and its optimum implementation under nursery conditions were also investigated. Lastly, Dr. Revynthi, together with USDA-ARS scientists from the Subtropical Horticulture Research Station, continued the efforts to develop an HBW lure that can be used for mass trapping and monitoring of the pest populations. The Ornamental Entomology & Acarology Lab will continue

conducting research on the chemical and biological control of *T. parvispinus* and HBW during 2024.

This is only one example of us giving back to the community for all the support they have given us. We do not take the generosity of the community for granted and will continue striving for excellence in all we do, knowing that excellence is a journey, not a destination, a permanent aspirational goal (Mike Martin).

Wishing you and your loved ones all the best for the holiday season, and good health and prosperity for the New Year.

Edward 'Gilly' A. Evans



Research Report

In this installment of TREC's Research Report, you'll learn about Dr. Bruce Schaffer, a Professor in the UF/IFAS Horticultural Sciences Department and his research.

Even before climate change became a talking point for legislators and policy makers, growers in south Florida were familiar with flooding and standing water in their fields due to hurricanes and tropical storms. For over 30 years, Dr. Bruce Schaffer has studied the effects of flooding on the physiology and growth of subtropical and tropical fruit crops in south Florida and what growers could do to mitigate flooding stress. Since flooding decreases the soil oxygen content negatively impacting plant metabolism, it is important to understand how some tropical fruit species have adapted to flooding conditions.

Dr. Schaffer has documented that some tropical fruit tree species grown in south Florida develop physiological, anatomical, or morphological mechanisms to adapt to soil hypoxia, a term for low soil oxygen content (approximately 1-4 mg/L), that results from flooding due to tropical storms and hurricanes. Some adaptations in response to long-term soil hypoxia include the development of stem aerenchyma tissue, adventitious root development, or hypertrophic (swollen) stem lenticels.

Recently, Dr. Schaffer's research has expanded to include the effects of salinity on crops. As a consequence of global climate change and rising ocean levels, salt water is expected to progress inland in south Florida, increasing the salinity of the soil and irrigation water. Currently in Dr. Schaffer's lab, the effects of salinity on papaya and achachairu, a potential new commercial crop for south Florida, are being investigated. You can learn more about these projects and other research emanating from Dr. Schaffer's lab [by reviewing his lab's website](#).



Congratulations

Student Awards

Jesse Potts, a PhD student in **Dr. Xingbo Wu's** Ornamental Breeding Lab, received \$500 and the 2023 Outstanding Member Award from the Golden Key Honor Society and the Love of Learning Scholarship in the amount of \$1,000 from the Phi Kappa Phi Honor Society.

Jesse Potts and **Shallu Thakur**, a Postdoc in **Dr. Geoffrey Meru's** lab, were each awarded a \$2,000 Travel Award to participate in the Gene Editing Message Development Workshop—an event organized by the Alliance for Science in collaboration with the Foundation for Food and Agriculture Research (FFAR) and the Boyce Thompson Institute at Cornell University. The workshop provided an overview of current gene editing technologies and approaches, emerging uses and applications, with sessions highlighting junior investigators and clinical gene editing programs.

Fitsum Teshome, a PhD student in **Dr. Haimanote Bayabil's** Water Resources Department, was recognized at the recently held 2023 American Society for Agricultural and Biological Engineers (ASABE) International Meeting in Omaha, Nebraska. The recognition was in relation to his oral presentation titled "Application of Unmanned Aerial Vehicle (UAV)-Based Imaging and Machine Learning for Sweet Corn Plant Phenotyping." Fitsum's presentation earned him the "Excellence Award for Outstanding Presentation" and carries a monetary value of \$250.

From **Dr. Dakshina Seal's** Vegetable Entomology Lab, **Victoria Adeleye**, a PhD student, and **Naga Mani Kanchupati**, a Masters student, each won \$250 in Fall travel grants from the Entomology and Nematology Student Organization.

At the annual meeting of the Acarological Society of America, three students from **Dr. Alexandra Revynthi's** Ornamental Entomology lab received awards. **Paola Villamarin** received the first place award for her abstract "Evaluation of four release methods for *Amblyseius swirskii* on bell pepper commercial production". **Marcello De Giosa** received the second place award for his abstract "Extraction of saliva from Eriophyid Mite immersion in different oils". **Maria Alejandra Canon** received the third place award for her abstract "Evaluation of biorational pesticides against Acarine pests of hemp (*Cannabis sativa*), a greenhouse approach and production of mite-free cuttings".



Faculty & Staff Awards

Dr. Haimanote Bayabil was honored at the UF Innovate's Standing InnOvation Showcase for disclosing a technology entitled, Mitigating salt-affected soils using liquefied biomass hydrogel.

In Dr. Geoffrey Meru's lab, Yuqing Fu was promoted from Biological Scientist 2 to Biological 3.

During the Fall semester, the Center Director recognizes exemplary staff with a **TREC Star Performer Award** at the Center's International Day. This year's winners include:

In the field of Technologist / Biologist:

Rebecca Tannenbaum

Pamela Moon

In the field of Administrative—Supervisory:

Monique I. Scoggin

In the field of Shop:

Nicholas Hughes

In the field of Field:

Cristian Benitez Sarmiento

In the field of Administrative—Non-Supervisory:

Ruth Villegas Mondragon

Yomiris Reyes



During International Day,
everyone is invited to bring a dish
native to their culture or country.

TREC IN FOCUS

Graduate Student

The Summer edition of the *TREC in Focus* on Graduate Student marked a 2-year anniversary for the newsletter! In this edition, we look back on the series and reminisce on the research of Sarah, Luis, Bella, Fitsum, and Aline and marvel at how each of the videos embodies some of the person, some of the lab, and a lot of their

research. To watch the highlight video, [click here](#). To see the whole series, [follow us on YouTube!](#)

We can't wait to continue the series in 2024 and anticipate another highlight video to commemorate a future anniversary.

You can find this and other videos on our YouTube channel: UFTropical!



PostDoc Exposé(d)

In this edition of TREC's PostDoc Exposé(d), we feature Dr. Shallu Thakur, a post doctoral researcher in Dr. Geoffrey Meru's Vegetable Breeding & Genomics lab.

Q: How did your previous experiences prepare you for your role at TREC?

A: I am currently working in Dr. Geoffrey Meru's Vegetable Genetics and Breeding lab. Dr Meru's research interests center around improvement of cucurbits employing breeding and genomics. I have a decade long experience of working on molecular techniques in different crops like rice (cereals) and chickpea (pulses). The molecular techniques and protocols are mostly similar, irrespective of the crop species and I am keen on applying all the knowhow in vegetables as well as horticultural crops. I am very enthusiastic and open to learn new technologies, techniques, practices and applying them for the improvement of cucurbits.

Q: Who has had the greatest influence on your career?

A: It is incredibly important to look back and thank the people who have helped you throughout your career. I don't deny that many people have had influences on my

TREC EXTENDED

Mark Wilson has served on the UF/IFAS TREC Advisory Board. Recently he accepted the position of Chairman of the Board. Mark Wilson runs the 30-acre Greendale Nursery in Homestead, Florida which



produces plants that are sold throughout North America. The plants from Greendale Nursery make their way to garden centers throughout the southeastern U.S. and Canada, to theme parks near Orlando, and to resorts in the U.S. and the Caribbean.

With his company's reputation for quality control, Greendale Nursery is one of few firms allowed to export to certain Caribbean islands. Enhancing the reach of his business, Mr. Wilson now includes social media to advertise and sell plants to members of the millennial generation. Mr. Wilson serves as an

advisory board member of the Economic Development Council of south Florida, has chaired the State committee for USDA's Farm Service Agency, been a director of Florida Farm Bureau, and served on the Governor's Commission for a Sustainable South Florida. In 2017, the Florida Farm Bureau recognized Mr. Wilson's Greendale Nursery as Florida Farm of the Year.

*Advisory
Board*

career: my PhD Mentor, teachers starting from school days, friends, family members, and many colleagues. Yes, they all influenced my career aspirations and decisions, but no one has had an influence on my career like my MOTHER. Going back to 90s, the society in which I grew up was not open to a girl's education. Sending a girl child to far places for higher education was rare. Being from a very humble background, my mother has broken the stereotypes of society and treated me and my brother equally and provided the same education to both despite of all the hardships and challenges. She was all about equality in every single way, and I learned a lot from her. I have one very vivid memory of a relative telling my parents not to waste the money on my education, that it would better saved for marriage. She always wanted me to stay strong, stay independent and not let anybody get in the way. I am highly inspired by her strength, passion, determination, equanimity and unconditional love. I learned hard work, determination, perseverance, patience, love and hopefulness from her—these are some of the characteristics which I think are key to success. Despite what life throws my way, remembering my mother keeps me grounded, hopeful and keeps me moving up in my career. I will always indebted to her and want to follow her footprints.




Upcoming (Extension) Events

January

- 11-14 Tamiami Orchid Festival
- 17-19 FNGLA TPIE
- 31 Hibiscus Bud Weevil Workshop

Dr. Zachary Brym and fellow Agronomy faculty members and county Extension agents developed this new one-pager defining Agroecology and how it can be implemented. To learn more, [visit Dr. Brym's website.](#)



UP IFAS Extension | **AGROECOLOGY LAB**

INTRODUCING AGROECOLOGY

Zachary Brym, Hamutahl Cohen, Hannah Wooten, Emma Matcham, and David Outerbridge

AGROECOLOGY—Farming that works with nature to maintain and balance reliable production with biodiversity, long-term environmental well-being, and social responsibility.

Agroecologists aim to address negative environmental and social consequences of agriculture and build in benefits for nature and society through a deep knowledge of the unique local and regional aspects of place, plants, and people.

Agroecology designs and practices support the principles of:

- **productivity** (biomass, carbon, nitrogen, yield, and income)
- **diversity** (plants, animals, microbes, fungi, and cultures)
- **resilience** (maintain or rebound in response to hardship or disturbance)
- **systems thinking** (reflection and planning for broad connections)

AGROECOSYSTEMS—Ecosystems managed for production of food, fuel, fiber, or medicines. These ecosystems include the interconnected components of agriculture and nature. Environmental and biological offerings of agroecosystems are broadly considered as ecosystem services.

AGROECOLOGICAL PRACTICES TO CONSIDER

Add plant diversity. Go beyond a focal crop. Planting hedgerows within crop fields or forested buffers around field boundaries can lessen the movement and erosion of soil, slow and filter the movement of water, disrupt extreme temperatures and winds, and encourage and increase the movement of wildlife.

Add animal diversity. Integrate livestock. Insect and wildlife diversity can increase the likelihood that beneficial insects will be present to pollinate crop flowers or predators will be present to feed on harmful pests.

Establish corridors. Connect biodiversity. Corridors of different sizes and composition can help the movement of pollinating insects or large wildlife such as the Florida panther.

Reduce. Reuse. Recycle. Adaptive and resource-conscious management can increase the internal cycling of energy, nutrients, and matter for conservation, restoration, and regeneration, or decrease the internal cycles and external pressures of environmental and biological pests.

Support humanity. Provide a living wage and healthy food. Food and shelter are human rights that enlist land managers to be stewards of the land and their community.

GETTING STARTED

Interested in developing an agroecological strategy for your farm, garden, or local food system?

1. **Map the agroecosystem.** Draw and list environmental, biological, and economic resources on your farm and those available externally. Consider lands, zoning, infrastructure, and equipment.
2. **Plan your agroecosystem.** Define productivity, biodiversity, and resilience targets. Balance target outcomes, expectations, and risks with agroecological design and practices. Detail and map your agroecosystem target for 1 year and 5 years in the future.
3. **Take action.** Design, develop, and deploy place-based agroecological solutions. Try an agroecological practice and evaluate the effectiveness of your plan and resulting changes to your agroecosystem.

For the full Ask IFAS publication, visit edis.ifas.ufl.edu/publication/as472.
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EDIS Publications

- Blare, T., **Ballen, F. H.**, Haley, N., Contreras, V., **Crane, J. H.**, **Carrillo, D.**, & Gonzalez, E. (2023). "Estimacion del costo y la rentabilidad de la produccion de lichi (*Litchi chinensis*) en el centro y sur de Florida: FE1131, 3/2023". EDIS 2023 (2). DOI: <https://doi.org/10.32473/edis-FE1131-2023>
- Frey, C., Dittmar, P. J., **Seal, D. R.**, **Zhang, S.**, Freeman, J. H., Desager, J., & Wang, Q. (2023). "Chapter 11. Legume Production: HS727, 8/2023". EDIS 2023. DOI: <https://doi.org/10.32473/edis-cv125-2023>
- Li, Q., Gluck, M., Wang, Y., Mussoline, W., Wang, Q., **Li, Y.**, & Liu, G. (2023). Symptoms of Nitrogen and iron deficiency in Luffa : HS1475, 11/2023. EDIS, 2023(6). DOI: <https://doi.org/10.32473/edis-hs1475-2023>
- Seal, D. R.**, Wang, Q., Kanissery, R., Meszaros, A., Snodgrass, C. A., Beuzelin, J., Desager, J., Dufault, N. S., Xavier, K. V., & **Zhang, S.** (2023). "Chapter 10. Minor vegetable crop production: CV294, 8/2023". EDIS 2023. DOI: <https://doi.org/10.32473/edis-cv294-2023>

Research Publications

- Ángel-Salazar, J. S., Echeverri-Rubiano, C., Rodríguez-Chalarca, J., López-Gerena, J., Ferreira dos Santos, R., Jurat-Fuentes, J. L., **Revynti, A. M.**, & Vargas, G. (2023). Development of a bioassay method to test activity insecticidal proteins against *Diatraea* spp. (Lepidoptera: Crambidae) sugarcane stem borers. *PLOS ONE* 18(10): e0292992. DOI: <https://doi.org/10.1371/journal.pone.0292992>
- Della Vecchia, J. F., Andrade, D. J., **Tassi, A. D.**, Roda, A., Santen, E. V., **Carrillo, D.** (2023). Can predatory mites aid in the management of the citrus leprosis mite? *Frontiers in Agronomy* 5-2023. DOI: [10.3389/fagro.2023.1304656](https://doi.org/10.3389/fagro.2023.1304656)
- Fischman, H. S., **Smyth, A. R.**, & Angelini, C., (2023). Invasive consumers provoke ecosystem-wide disruption of salt marsh functions by dismantling a keystone mutualism. *Biological Invasions*, 2023. DOI: <https://doi.org/10.1007/s10530-023-03167-4>
- Getachew, F., **Bayabil, H.**, Hoogenboom, G., Kiker, G. A., Yu, Z., & **Li, Y.** (2023). Development of climate-smart sorghum ideotype for climate resistance in Ethiopia. *Field Crops*, 303, 109135. DOI: <https://doi.org/10.1016/j.fcr.2023.109135>
- Hailegnaw, N. S., Bayabil, H. K., & Li, Y. C.** (2023). Environmental implications of salinity and flooding induced changes in porewater nitrogen and phosphorous dynamics. *Environmental Pollutants and Bioavailability*, 35(1), 2269314. DOI: <https://doi.org/10.1080/26395940.2023.2269314>
- Huang, Y., Jones, C., Urbina, H., **Zhang, Z.** (2023). First report of leaf blight caused by *Curvularia aeria* and *C. senegalensis* on Tomato (*Solanum lycopersicum*) in Florida, USA. *Plant Disease*, 2023 . DOI: <https://doi.org/10.1016/j.biocontrol.2023.105404>
- Liu, B., Liu, H., Zhang, S., Ji, X., **Zhang, S.**, Wang, Z., & Qiao, K. (2023). Evaluation of the reproductive toxicity of fluopimomide in *Meloidogyne incognita* and *Caenorhabditis elegans*. *Agronomy*, 13(10), 2471. DOI: <https://dx.doi.org/10.3390/agronomy13102471>
- Michael, V.**, Demesyeux, L., Bombarely, A., **Wu, X.**, Chambers, A. (2023). Miracle fruit pulp transcriptomes identify genetic variants in support of discovery research and breeding. *Journal of the American Society for Horticultural Science*, 14b(5). DOI: <https://dx.doi.org/10.21273/JASHS05312-23>
- Moreno, S. R., Sims, C. A. , Odabasi, A., Simonne, A., Gao, Z., Chase, C. A., **Meru, G.**, MacIntosh, A. J. (2023). Chemical and physical properties of winter squash and their correlation with liking of their sensory attributes. *Journal of Food Science* 2023, PMID: 37755684 DOI: <https://doi.org/10.1111/1750-3841.16771>
- Potts, J., Jangra, S., Michael, V. N., & Wu, X.** (2023). Speed breeding for crop improvement and food security. *Crops* 2023, 3(4), 276-291. DOI: <https://doi.org/10.3390/crops3040025>
- Silvia Ataide, L. M., Della Vecchia, J. F., Ochoa, R., Carrillo, D., Revynti, A.** (2023). Influence of temperature on population size of *Aceria litchi* (Acari: Eriophyidae) and the development of its galls. *Experimental and Applied Acarology*. DOI: <https://doi.org/10.1007/s10493-023-00872-6>
- Thakur, S. and Meru, G.** (2023). CRISPR/Cas9 mediated editing of phytoene desaturase gene in squash. *Journal of Plant Biochemistry and Biotechnology*, 2023. DOI: <https://doi.org/10.1007/s13562-023-00866-w>
- Urbina, H., Jones, C., Moore, M. R., & **Gazis, R.** (2023). Susceptibility of centipede tongavine, *Epipremnum pinnatum*, commercially grown in nurseries in Florida to Aroid leaf rust, *Pseudocercospora paullula*. *Plant Disease*, 2023. DOI: <https://doi.org/10.1094/pdis-07-23-1360-pdn>
- Wu, X.** Simpson, S. A., Youngblood, R. C., Liu, X. F., Scheffler, B. E., Rinehart, T. A., Alexander, L. W., Hulse-Kemp, A. M. (2023). Two haplotype-resolved genomes reveal important flower traits in bigleaf hydrangea (*Hydrangea macrophylla*) and insights into Asterid Evolution. DOI: <https://doi.org/10.1093/hr/uhad217>



On November 4, the UF/IFAS Tropical Research & Education Center hosted its ninth annual *One Night in the Tropics*! Thanks to our title sponsor, Miami-Dade County Commissioner Danielle Cohen-Higgins, we again hosted a crowd of over 300 people! Here are a few highlights from the evening. To see all of the entities and people who helped to make this year's event a success, [watch this video](#).





FIND US ON SOCIAL!

ICYMI — These are just some of the highlights from the beginning of the Fall semester at UF/IFAS TREC. To stay up to date on all of TREC's news and events, follow us on all platforms at [UFTropical](#) or bookmark the *TREC in the News* page on our [website](#).

