

# INSIDE TREC



## Winter 2023

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## From the Desk of the Director

Recently, I attended a gathering on the State of South Dade 2023, Homestead, Florida. It was so gratifying to hear so many of our legislators speak of the importance of agriculture which, indeed, it is.

But I could not help but cast my mind to another gathering I attended a few weeks earlier that was attended by high school seniors in a STEM program, some of whom were already enrolled in college courses. At that gathering, I asked, by a show of hands, how many had plans of pursuing a career in some aspect of agriculture and, sadly, no hands were raised. Later, in my engagement with the students, it became obvious that while they all were of the view that agriculture is important, they equated it solely with production agriculture, rather than with the tremendous technological innovations that are transforming agriculture as a multidisciplinary and interdisciplinary science. Truth be told, many of them had parents who worked as laborers and might have been dissuaded due to that fact. Not showing my disappointment, I continued our engagement with a soft sell, pointing out the myriad of career paths in agriculture that are available which are comparable to those in other scientific fields, such as medicine, engineering, etc. I listed at least 40 different careers in agriculture and reinforced the

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You may forward any questions or comments about this periodical to Monique Scoggin, [mis6664@ufl.edu](mailto:mis6664@ufl.edu).

## ***From the Desk of the Director (continued)***

the fact that advanced scientific knowledge is required for each of these careers. I made the point that agriculture is not static but, rather, science in action. I then gave examples of some of the exciting research and discoveries we are conducting at UF/IFAS TREC. Pointing out and describing, as best as I could, that the usage of modern biological techniques, such as Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR)-associated systems (Cas), a gene editing technique, which is successfully being used in precision medicine for the treatment of hereditary diseases, viral infections, and cancers, is the very same technique we are using as part of our precision agriculture program to improve crops. As an example, I pointed to the work being done by Dr. Geoffrey Meru, one of our geneticists and plant breeders, to develop novel cucurbit cultivars using this technique. The cucurbit (squash and watermelon) industry in Florida has an annual combined value of ~\$200 million and >32,000 acres in cultivation. Among other things, it is threatened by diseases, such as powdery mildew and downy mildew (fungi), that cause growers to lose thousands of dollars due to loss in sales and additional production costs using chemicals. One aspect of Dr. Meru's research is aimed at identifying the susceptible genes that cause crops to succumb to the diseases and then, using the CRISPR technique, to switch off (knockout) those genes- which is identical to what is being done in medicine to switch off genes that might make a person become more susceptible to a particular genetic defect.

At the end of my presentation, I was elated when one of the students raised her hand and asked if it were possible to do an internship at our Center and whether we had any of those mangoes that I told them about that we were working on improving their flavor, aroma, and taste. While mangoes were out of season, I told her yes there is the possibility to do an internship. My hope is that I have planted a seed in the minds of some of the best and brightest students to consider agriculture as the career field of their choice.

*Edward 'Gilly' A. Evans*



## ***UF's Core Value Connection***



### ***Freedom & Civility***

In this issue, Dr. Evans maintained a level of mutual respect for the students who initially indicated no interest in careers in Agriculture. However, as the students toured TREC and learned that all of the research and exploration conducted at the Center supports Agriculture, their inquisitive minds began to consider how their passions (from genetics to computer programming) could be integrated in a field that surrounds them and with which they are already familiar.

To learn more about the UF Core Values, click [here](#).



# Research Report

In this installment of TREC's Research Report, you'll learn about Dr. Romina Gazis, an Assistant Professor in the UF/IFAS Plant Pathology Department and Director of the UF/IFAS Tropical Research & Education Center's Plant Diagnostic Clinic.

Dr. Gazis has traveled through plantations and natural forests of the Americas and Africa collecting, identifying, and characterizing hundreds of fungal cultures resulting—so far—in the description of ten novel species. Her work has made significant contributions to the fields of fungal diversity and systematics.

Dr. Gazis and her team have recently discovered and described two new species of *Tolypocladium* which were isolated from within the trunk of south Florida slash pines. *Tolypocladium* is a diverse genus with species having lifestyles ranging from tree endophytes, mycoparasites, and entomopathogens. Several species are known as prolific producers of secondary metabolites and used widely in medicine and agriculture. She has named one of the new species *Tolypocladium trecense*, in honor of the Tropical Research and Education Center. By naming this species after TREC, she is recognizing the effort our center has made towards preserving the fragile Pine Rockland ecosystem. Dr. Gazis and her team will use these new species in laboratory bioassays to determine their potential applications in the biological control of important diseases affecting our local industry such as Laurel Wilt, the disease threatening our avocado industry.

For more information on this forthcoming publication, follow [Dr. Gazis' on Twitter](#) or [UFTropical on Facebook](#). To learn more about Dr. Gazis and her body of work, click [here](#).



# TREC IN FOCUS

## Graduate Student

In this edition of TREC's graduate student *In Focus* series, we're zooming in on Bella Reyes, a Ph.D. student in Dr. Ashley Smyth's Biogeochemistry Lab. In this video, Bella discusses her work with mangroves and what she aims to achieve with her PhD.

As a native of south Florida, Bella was drawn to mangroves as a child because they were among the only greenery present along the coastal waters of Miami's Beaches. "Mermaid pens", as Bella's imagination interpreted the

mangrove propagules floating in the ocean, stimulated her to ask her first questions about the natural world. As an adult, these "mermaid pens" continue to fascinate Bella and stimulate her ongoing research. Bella notes that mangroves are one of the only woody species that exist in the stressful conditions of urban coastal ecosystems and that they are one of the few trees that inhabit the land/sea divide. The existence of mangroves in these spaces is the allure—what can humans learn from the resilience of these trees and how can humans conserve the natural environments and ecosystems that surround their urban landscapes—are some of the questions that motivate Bella's research. To learn more



You can find this and other graduate student videos on our YouTube channel.



about a day in the life of a biogeochemist, [watch this video](#).

In this edition of TREC's PostDoc Exposé(d), we feature Dr. A. Daniel Greene, a post doctoral researcher in Dr. Alexandra Revynthi's Entomology & Nematology lab.

## PostDoc Exposé(d)

**Q:** Where were you previously? How long have you been at TREC?

**A:** Prior to my arrival at TREC in October 2021, I attended Clemson University for my PhD (2015-2021). My research at Clemson primarily focused on gaining a better understanding of which biotic and abiotic factors influence the spatiotemporal distributions of soybean pests and natural enemies with the purpose of using this information to increase the precision of management efforts.

**Q:** What is the next step for you? How have your experiences at TREC prepared you for it?



**A:** My position as a post-doc ends this year, so I am preparing to move into a teaching position in higher education. I am also interested in having a research appointment alongside my teaching responsibilities, and I would certainly be interested in an industry position involving field work. My experience here as a post-doc under the supervision of Dr. Alexandra Revynthi has prepared me in many ways, but the skills that I have developed the most and am the most grateful for are: patience, learning how to develop strong personal and professional relationships with diverse colleagues from all over the world, and the process of taking a preliminary hypothesis or idea, turning it into a well-designed experiment, and seeing it through until it reaches a worldwide audience.



# TREC EXTENDED

Dr. Martin Motes is widely regarded as the foremost expert on vanda orchids in the world. His published articles on vandas include descriptions of several new species, among them *V. marie*, for his wife of more than 40 years, Mary. His nursery, Motes Orchids, specializes in unique vanda hybrids of his own creation.



Advisory  
Board

In 2009, the species *Vanda motesiana* was Redland and Tamiami International Orchid Festivals—the largest orchid events in the United States. He is a Research Fellow at Fairchild Tropical Botanical Gardens and is a consultant on Fairchild's Million Orchid Project, which aims to restore native Florida orchids to Miami-Dade County.

To learn more about TREC's Advisory Board, click [here](#).

## EDIS Publications

- Bhadha, J. H., Xu, N., Amgain, N. R., Rabbany, A., **Blare, T. B., Ballen, F. H., & Swanson, S.** (2022). Cost assessment of utilizing bagasse to grow sugarcane based on nutrient availability: FE1121, 12/2022. *EDIS* 2022 (6). DOI: <https://doi.org/10.32473/edis-FE1121-2022>
- Blare, T., Ballen, F. H., & Crane, J. H.** (2022). Overview of US Tahiti Lime production and markets: Trade and consumption analysis: FE1122, 12/2022. *EDIS* 2022 (6). DOI: <https://doi.org/10.32473/edis-fe1122-2022>
- Blare, T., Ballen, F. H., Haley, N., Contreras, V., Crane, J. H., & Carrillo, D.** (2022). Cost and profitability estimates for producing lychee (*Litchi chinensis*) in south and central Florida: FE1127, 12/2022. *EDIS* 2022 (6). DOI: <https://doi.org/10.32473/edis-FE1127-2022>
- Chambers, A. H., **Moon, P., de Verlands Edmond, V., Bassil, E., & Wu, X.** (2023). Vanilla cultivation in southern Florida. *EDIS* 2023. DOI: <https://doi.org/10.32473/edis-hs1348-2023>
- Donnelly, H., **Smyth, A., Baker, S., Reynolds, L., Collins, A.** (2023). How do oysters remove nitrogen? *EDIS* 2023 (1). DOI: <https://doi.org/10.32473/edis-SS711-2023>
- Martin, C. G. & Brym, Z. T.** (2022). The value of tropical diversity: SS/AGR435, rev. 12/22. *EDIS* 2022. <https://edis.ifas.ufl.edu/publication/AG435>

To learn more about the Plant Diversity research that Dr. Zachary Brym is leading at the UF/IFAS Tropical Research & Education Center, check out the playlist on our YouTube channel.



- Williamson, J. G., **Crane, J. H., Vashisth, T., & Sarkhosh, A.** (2022). Dooryard fruit varieties: FC23/MG248, rev. 12/2022. *EDIS* 2022 (6). DOI: <https://doi.org/10.32473/edis-mg248-2022>

# Student Awards

**Marielle de Moraes Berto**, a PhD student in **Dr. Daniel Carrillo's** lab, won the student competition at the International Congress of Acarology in Auckland, New Zealand.

**Sisi Chen**, a graduate student in **Dr. Xingbo Wu's** Ornamental Plant Breeding lab, received the L. Russel Norton Memorial Fellowship from the Dade County AgriCouncil in the amount of \$500 for her research in "Establishing the foundation of tropical hibiscus breeding program for Florida nursery industry".

**Ketsira Pierre**, a graduate student in **Dr. Shouan Zhang's** lab, received the Dennis Carpenter Memorial Fellowship from the Dade County AgriCouncil in the amount of \$500 for her research in "Mitigating impacts of salinity and diseases for sustainable vegetable production".

**Christ Mane Belizaire**, a graduate student in **Dr. Romina Gazis'** lab, received the William H. Krome Memorial Fellowship from the Dade County AgriCouncil in the amount of \$500 for her research in "Generating research resources to address an economical important but often neglected disease: Avocado scab".

**Aline de Camargo Santos**, a PhD candidate in **Dr. Bruce Schaffer's** lab, received the Seymour Goldweber Scholarship from the Dade County AgriCouncil in the amount of \$500 for her research in "Understanding crop responses to drought and salinity to alleviate stress impact on crop production".

**Swati Shrestha**, a PhD candidate in **Dr. Geoffrey Meru's** lab, received the Warren Wood, Sr Memorial Fellowship from the Dade County AgriCouncil in the amount of \$500 for her research in "Development of squash varieties resistant to potyviruses for south Florida region".



**From left to right:** Sisi Chen, Christ Mane Belizaire, Aline de Camargo Santos, Ketsira Pierre, and Dr. Edward "Gilly" Evans at the 58th Annual AgriCouncil Luncheon.

## Faculty & Staff Awards

Dr. Xingbo Wu (PI replacement for Dr. Alan Chambers), Dr. Trent Blare and others have been awarded a total of \$383,000 by The Sustainable Agriculture Research and Education (SARE) Program. The title of their proposal is “Establishing domestic vanilla cultivation in southern Florida, Puerto Rico, and the US Virgin Islands Amount”. Implementation of the grant will commence April 1 and end March 31, 2026.



The following faculty members' received funding for proposals submitted to the UF/IFAS Support for Emerging Enterprise Development Integration Teams (SEEDIT):

a. **Dr. Xingbo Wu**, proposal titled “Optimizing vanilla production through horticulture, plant breeding, and discovery research” (\$75,000).

b. **Dr. Ashley Smyth**, proposal titled “Seaweed Production for Climate Smart Cattle & Bioremediation” (\$74,934).

c. **Dr. Trent Blare**, proposal titled “Addressing Chokepoints Impeding the Development of a Value Chain for Florida Finger Limes” (\$45,000).

**Dr. Alexandra Revynthi** was one of the recipients of the 2022 UF/IFAS Archer Early Career Seed Grants. The program helps facilitate the development of new faculty research programs and provides a platform for their future success. As a recipient of this grant, Dr. Revynthi was awarded \$49,815.

**Yuqing Fu**, a biologist in **Dr. Geoffrey Meru's** lab, was recognized for her superior service in the Scientific/Technical category of the 2022 UF/IFAS Annual Staff and Faculty Superior Accomplishment Awards. For this recognition, Yuqing received a check in the amount of \$200.00, a certificate, a commemorative coffee mug, and a gift bag. She is also being considered for the campus-wide recognition in the same category and an opportunity to receive a check for \$2,000 and a personal plaque.

## Upcoming Extension Events

### March

28 Update: Thrip par-  
Business of Farming  
30 Workshop (part 1)  
Vegetable Field Day

### April

3 Hemp planting & nu-  
trient management  
6 Business of Farming  
Workshop (part 2)  
11 Agriculture in Zone  
— 10B: Below The  
12 Freeze

### May

8 — Agricultural Acarol-  
12 ogy Workshop  
19 Redland Interna-  
— tional Orchid Festi-  
21 val



# ***In Memoriam: Dr. Robert McMillan***

We are saddened of the passing of one of TREC's extended family members, Dr. Robert T. McMillan. A Miami native, Dr. McMillan began his career as an Associate Professor with the UF/IFAS Tropical Research & Education Center in 1967. He rose through the ranks to become a full professor in 1995 and upon retirement in 2003, was awarded Professor Emeritus status. His tenure in the UF/IFAS Plant Pathology Department spanned more than five decades. During that time, Dr. McMillan taught Plant Pathology courses at TREC and FIU and had several abstracts and presentations on various topics related to tropical fruit and vegetable pathogens at state, regional, national, and international meetings. Dr. McMillan also educated local growers, master gardeners, Extension agents, and the general public for over 30 years.

Among a few of Dr. McMillan's accomplishments include

- Contributing towards the development of at least 10 snap bean germplasm lines;
- Contributing to patents related to the control of fungi and bacteria;
- Receiving over \$1 million in contracts and grants funded;
- Publishing numerous articles in refereed publications;
- Serving in several positions of both the Tropical Pathology Committee and Caribbean Division of the American Phytopathological Society;
- Serving as Associate Editor of one of the American Phytopathological Society's journals; and
- Consulting domestic industry leaders and international growers and governments.

Perhaps one of his greatest contributions to TREC and indeed the agricultural community was the establishment of the Extension Plant Diagnostic Clinic in 1990. Dr. McMillan served as the first Director of the Clinic and initiated the excellent service in response to requests of both domestic and international growers that the Clinic continues to provide today.

The span of Dr. McMillan's research made significant contributions in elucidating the cause, development, and control of several diseases of tropical crops, in evaluating the kinds, dosages, and timing of application of several fungicides for plant disease control. His research and extension performance on the causes of diseases and their control in tropical fruits and vegetables, excellent rapport with and outstanding service to the growers and to agriculture of south Florida, and his national and international recognition are the legacy that Dr. Robert McMillan leaves behind.

He was married to Ida McMillan and had 2 children: Robert T. McMillan, III, and Kathryn Rohan. Ms. Ida McMillan and Robert T. McMillan, III predeceased Dr. McMillan. In recognition of the family's contributions to the TREC dormitory campaign, two of the rooms of Pauline O. Lawrence Student Residence will be named in honor of Robert and Ida McMillan.



Dr. Robert T. McMillan

1934–2022



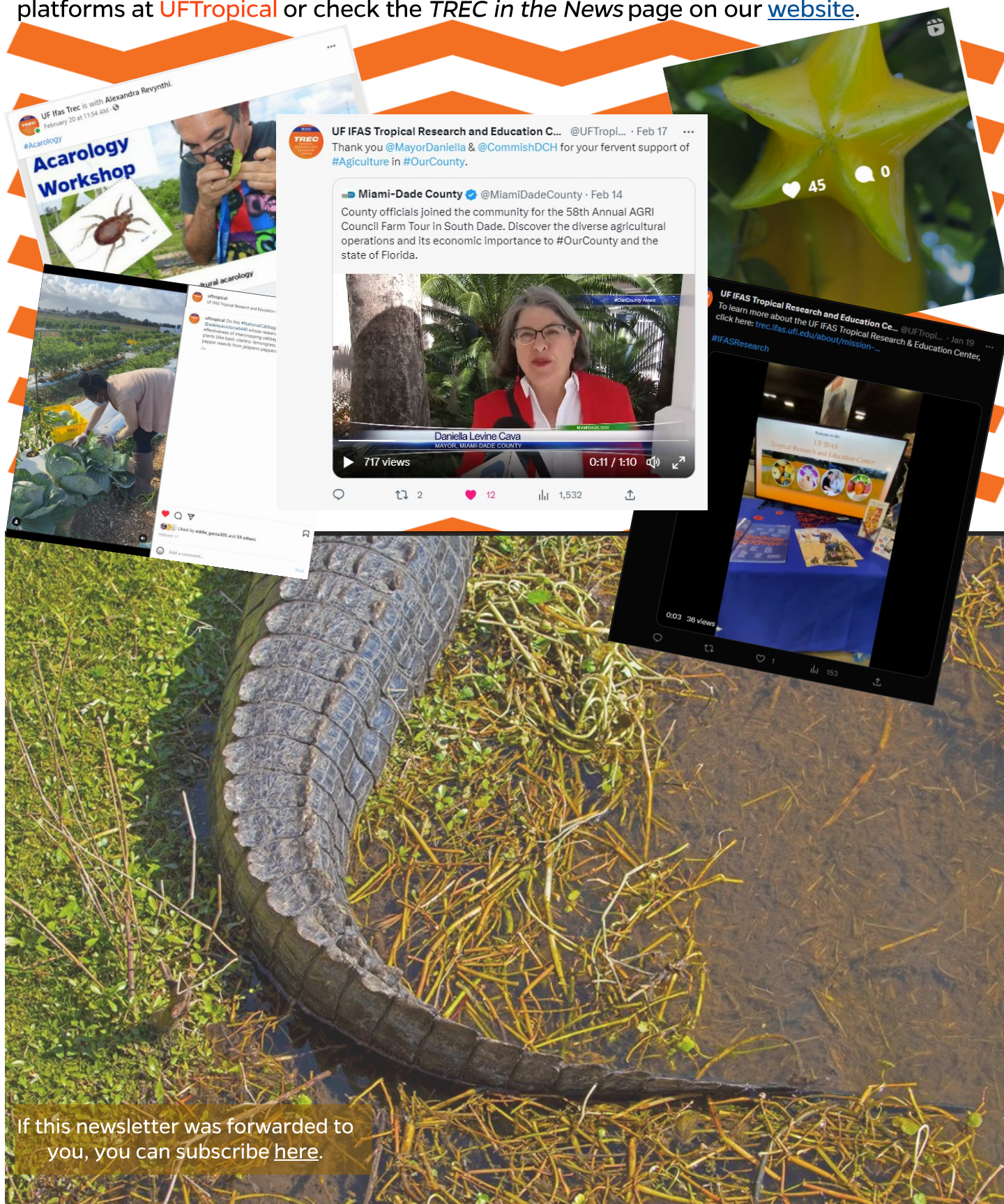
# Research Publications

- Anderson, J. D., Gastelbondo, M., Chambers, A. H.** (2022). Diagnostic KASP markers differentiate *Vanilla planifolia*, *V. ordata*, *V. pompona*, and their hybrids using leaf or cured pod tissues. *Molecular Biology Reports*, 2022 . DOI: <https://doi.org/10.1007/s11033-022-08085-7>
- Bayabil, H. K., Teshome, F. T., Guzman, S. M., & Schaffer, B.** (2023). Evapotranspiration rates of three sweet corn cultivars under different irrigation levels. *HortTechnology*, 33, 1. DOI: <https://doi.org/10.21273/HORTTECH05114-22>
- Chagas, E. A., **Crane, J. H.**, Chagas, P. C., Vendrame, W., Costa, B. N. S., Neto, A. R., de Araujo Machado, C., Moura, E. A. (2023). Somatic embryogenesis of *Myrciaria dubia* (Kunth.) McVaugh. *HortScience*, 58(3), 293-300. DOI: <https://doi.org/10.21273/HORTSCI16964-22>
- Coate, J. E., Chen, J-T., **Meru, G. M.** (2023). Editorial: Artificial polypoidy in plants, volume II. *Frontiers in Plant Science*, 1124292. DOI: <http://dx.doi.org/10.3389/fpls.2022.1124292>
- Etherton, B. A., Choudhury, R. A., Alcala-Briseno, R. I., Xing, Y., Plex Sula, A. I., **Carrillo, D.**, Wasielewski, J., Stelinski, L. L., Grogan, K. A., **Ballen, F., Blare, T., Crane, J.**, Garrett, K. A. (2023). Are avocados toast? A framework to analyze decision-making for emerging epidemics applied to laurel wilt. *Agricultural Systems*, 206, 103615. DOI: <https://doi.org/10.1016/j.agsy.2023.103615>
- Getachew, A., Woldesenbet, T. A., Taddele, Y. D., & **Bayabil, H. K.** (2022). Modeling impacts of future climate change on the hydrological processes in the Baro-Akobo River basin, Ethiopia. *Acta Geophysica*. DOI: <https://doi.org/10.1007/s11600-022-00956-8>
- Liu, H., Fu, G., Li, Y., **Zhang, S.**, Ji, X., Qiao, K. (2023). Biocontrol efficacy of *Bacillus methylotrophicus* TA-1 against *meloidogyne incognita* in tomato. *Plant Disease*. DOI: <https://doi.org/10.1094/PDIS-12-22-2801-RE>
- Oberlack, C., **Blare, T.**, Zambrino, L., Bruelisauer, S., Solar, J., Villar, G., Thomas, E., Ramirez, M. (2023). With and beyond sustainability certification: Exploring inclusive business and solidarity economy strategies in Peru and Switzerland. *World Development*, 165, 106187. DOI: <https://doi.org/10.1016/j.worlddev.2023.106187>
- Ribeiro, P. G., Martins, G. C., Zhu, X., **Li, Y. C.**, & Guilherme, L. R. G. (2022). Combined effects of hydrothermally-altered feldspar and water regime on cadmium minimization in rice. *Environmental Research*, 125, 114259. DOI: <https://doi.org/10.1016/j.envres.2022.114259>
- Sherwood, A., Alexander, L. W., Clark, M. D., **Wu, X.**, Hokanson, S. C., (2023). Precipitation, temperature, and population structure influence genetic diversity of oakleaf hydrangea throughout its native range. *Journal of American Society for Horticultural Science, American Society for Horticultural Science*, 148 (1): 29-41. DOI: <http://dx.doi.org/10.21273/JASHS05255-22>
- Tefera, B. B., Bayabil, H. K., Tong, Z., Teshome, F. T., Wenbo, P., Li, Y. C., Hailegnaw, N. S., & Gao, B.** (2022). Using liquefied biomass hydrogel to mitigate salinity in salt-affected soils. *Chemosphere*, 309, 136480. DOI: <https://doi.org/10.1016/j.chemosphere.2022.136480>
- Xu, N., Bhadha, B., Rabbany, A., Swanson, S., Mccray, J., **Li, Y.C.**, Strauss, S., & Mylavarapu, R. (2022). Sugarcane bagasse amendments mitigate nutrient leaching from a mineral soil under tropical conditions. *Pedosphere*, 32(6), 876-883. DOI: <https://doi.org/10.1016/j.pedsph.2022.06.020>
- Zhang, S., Yang, M., Meng, S., Yang, Y., **Li, Y. C.**, & Tong, Z. (2022). Biowaste-derived, nanohybrid-reinforced double-function slow-release fertilizer with metal-adsorptive function. *Chemical Engineering Journal*, 450(2), 138084. DOI: <https://doi.org/10.1016/j.cej.2022.138084>



## FIND US ON SOCIAL!

ICYMI — These are just some of the highlights from the beginning of the Spring 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 check the *TREC in the News* page on our [website](#).



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