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The University of Texas
Rio Grande Valley™
.....
Center for Sustainable Agriculture
& Rural Advancement

THE
UNIVERSITY OF TEXAS
RIO GRANDE VALLEY

OFFICE OF THE
EXECUTIVE VICE PRESIDENT
FOR RESEARCH,
GRADUATE STUDIES, AND
NEW PROGRAM
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Program Information:
The SARA Report shares
the research, education,
outreach, and extension
activities in
sustainable agriculture
and rural advancement
at UTRGV

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SARA Staff in the News

To share feedback/questions or to join our mailing list, please e-mail Dahlia Vela at dahlia.vela@utrgv.edu.

Research & Education

1. USDA funds Training, Research, and Education in Soil Science (TRESS)

A new initiative to create a South Texas hub for soil science has been recently funded by the USDA for \$275,000. TRESS will enhance education, training, and provide research experience, addressing relevant USDA educational-need areas, preparing UTRGV students for soil-science careers. TRESS is led by Drs. Pereira, Cheng, and Kang from the School of Earth, Environmental, and Marine Sciences. UTRGV's Center for Sustainable Agriculture and Rural Advancement (SARA) will support TRESS on:

- Staff for grant management and outreach activities
- Experiential-learning, internship, and career opportunities for students
- Student access to community-engaged projects and leadership programs
- Research opportunities through Community-Based Participatory Research
- Access to SARA training events for project promotion and outreach
- Potential speakers and guest-lecturers for professional talks
- Video production for promoting TRESS activities and objectives
- Connections with additional, potential collaborators for TRESS

A website has been established for TRESS. This website will be used to share student opportunities, success stories, announcements, and event promotion: <https://www.utrgv.edu/soilscience>. For more information on TRESS, or to discuss website links and postings, please contact Dr. Engil Pereira at Engil.pereira@utrgv.edu.

2. Participatory research on sweet potatoes results in research presentations

UTRGV's Center for Sustainable Agriculture and Rural Advancement (SARA) assisted with the establishment of a field trial, in partnership with the McAllen Composting Facility, that studied soil nutrient availability for sweet potatoes. Dr. Engil Pereira and her students presented the results from this study at an international event in San Diego, California hosted by the Soil Science Society of America (SSSA). Presentations included:

- Jahdiel Salazar, Josabeth Navarro, Jihoon Kang, and Engil Pereira. "Sweet potato: a potentially profitable summer crop for South Texas organic farmers to enhance soil biological activity and nutrient release.," SSSA International Soils Meeting, Soil Science Society of America, San Diego, CA (January 2019) <https://scisoc.confex.com/scisoc/2019sssa/meetingapp.cgi/Paper/115592>
- Josabeth Navarro, Jahdiel Salazar, Jihoon Kang, and Engil Pereira. "Sweet Summer Spud: South Texas soil fertility management strategies with organic amendments to increase nutrient availability and reduce nutrient depletion," SSSA International Soils Meeting, Soil Science Society of America, San Diego, CA (January 2019) <https://scisoc.confex.com/scisoc/2019sssa/meetingapp.cgi/Paper/115593>

Results of the participatory research were presented at the SSSA International Soils Meeting, "Soils Across Latitudes", held on January 6-9 in San Diego, California in collaboration with the Canadian Society of Soil Science and the Mexican Society of Soil Science. For more information on UTRGV's sweet-potato research, contact Dr. Engil Pereira at engil.pereira@utrgv.edu.

3. Brownsville Research & Community Garden includes high-tunnel greenhouse

The Brownsville Research and Community Garden (BRCG) has expanded to include a 2,160 sq. ft. high-tunnel greenhouse. The new structure features roll-up sides to allow researchers the optimal mix of natural climate conditions, yet enough environmental control to regulate experiments. The Brownsville greenhouse will complement the BRCG's first-of-its-kind zero-electricity aquaponics growing system, which features hydrologically-connected raised growing beds, treatments wetlands (which filter water), and aquaculture ponds, and is based on a natural watershed design. Funding for the high-tunnel greenhouse was provided by the UTRGV College of Sciences through the new Sustainable Agriculture and Food Systems B.S. Program. UTRGV faculty, staff, and graduate and undergraduate students were responsible for site preparation and construction. For more information on research, teaching, or demonstration at the BRCG, contact Dr. Chris Gabler at christopher.gabler@utrgv.edu.

4. BRCG greenhouse to play critical role in student education

The new high-tunnel greenhouse at the Brownsville Research and Community Garden (BRCG) will play a critical role in student research and education. This greenhouse will have the infrastructure required for the thesis research of four AESS MS graduate students: 1) Andrew Corder has deployed an array of 126 five-gallon mesocosms to test the viability of using food crops, such as rice or sorghum, to purify water in treatment wetlands; 2) Ashley Bowers will be building a series of aquaponic production systems with and without bacterial biofloculant to test whether this cutting-edge aquaculture technique impacts food safety and risk of exposure to bacterial pathogens like *E. coli*; 3) Itohan Edokpolo will be building a series of hydroponic plant production systems to investigate the costs and benefits associated with different vertical farming designs, and will be emphasizing low-cost, recycled materials for system construction; 4) Paula Luera, in collaboration with the USFWS, will be establishing a Rio Grande Valley native plant nursery in the new greenhouse to produce seedstock and thousands of young plants for use in regional habitat restoration projects. The BRCG greenhouse, and indeed the very systems being used for graduate thesis research, will also be leveraged for undergraduate teaching and research.

"This greenhouse further increases the capacity of the BRCG as a key outdoor classroom and living laboratory for UTRGV students and faculty in the agricultural, biological, environmental, and food sciences. And we would love to bring in more chemistry and engineering students and faculty as well. Our new aquaponics and hydroponics systems are particularly relevant to those disciplines," states UTRGV Assistant Professor and BRCG Director, Dr. Chris Gabler. For more information on using the high-tunnel greenhouse as an educational tool, contact Dr. Chris Gabler at christopher.gabler@utrgv.edu.

5. Research shows conservation tillage improves soil structure

SARA-affiliated faculty member Dr. Engil Pereira and collaborators from the Swiss Federal Institute of Technology evaluated whether decreasing the tillage intensity in organic systems could favor soil structure while maintaining soil health and crop productivity. Traditionally, organic farming uses conventional tillage practices for weed control, even though tillage has numerous negative effects for soil physical properties that can result in organic matter losses. Through a field study, the team found that by replacing an 8-inch moldboard plowing with a 2-inch disk harrow maintains soil particles cohesion resulting in organic matter retention, habitats for microorganisms in soil aggregates, and decreased erosion. These findings were published in two papers:

- Viviana Loaiza Puerta, Engil Pereira, Raphaël Wittwer, Marcel van der Heijden, and Johan Six. "Improvement of soil structure through organic crop management, conservation tillage and grass-clover ley," *Soil and Tillage Research* 180, (2018): 1-9.
<https://www.sciencedirect.com/science/article/pii/S0167198718300850>

- Steffen Seitz, Philipp Goebes, Viviana Puerta, Engil Pereira, Raphaël Wittwer, Johan Six, Marcel van der Heijden, and Thomas Scholten. "Conservation tillage and organic farming reduce soil erosion," *Agronomy for Sustainable Development* 39, no. 1 (2019): 4.
<https://link.springer.com/article/10.1007/s13593-018-0545-z>

For more information on the improvement of soil structure through organic crop management, contact Dr. Engil Pereira at engil.pereira@utrgv.edu.

6. UTRGV research garden expands to include high-tunnel hoop house

The certified-organic research garden at UTRGV's Edinburg campus now includes a high-tunnel hoop house to assist UTRGV students doing research in organic and sustainable agriculture. The 1,400 sq. ft. hoop house measures 20 feet by 70 feet and is located near the northwest corner of the Agroecology Research & Community Gardens. Hoop houses are a type of greenhouse that are relatively inexpensive and allow for higher production and extended growing seasons, increasing on-farm revenues. The hoop house will allow UTRGV agricultural researchers to better control crop-production variables, and to assist farmers in developing best practices for high-tunnel production in the Rio Grande Valley of South Texas. "Much of the research done on hoop-house production focuses on the cooler regions of the U.S. With this on-site hoop house, we should be able to make significant contributions to best practices for hoop-house production in the sub-tropical Rio Grande Valley," states SARA co-director Dr. Alex Racelis.

Funding for the high-tunnel hoop house was generously provided by USDA's Natural Resources Conservation Service (NRCS). SARA staff were responsible for pre-construction site preparation and construction oversight. For more information on hoop-house research and demonstration, contact Dr. Alex Racelis at alexis.racelis@usda.gov

7. SARA wine research highlighted by UTRGV

Wine research done by the Center for Sustainable Agriculture and Rural Advancement (SARA) was recently highlighted by UTRGV in *The Newsroom*. The Newsroom article, titled *University's Center for Sustainable Agriculture and Rural Advancement researches wine-making with citrus, hybrid grapes*, is accompanied by a video titled *UTRGV researcher makes bold fruit selections for wine*. The article and the video can be viewed at <https://www.utrgv.edu/newsroom/2019/01/24-utrgv-researcher-makes-bold-fruit-selections-for-wine.htm>. For more information about wine research at SARA, please contact George Bennack at george.bennack@utrgv.edu.

8. Citrus wines may be well suited for organic wine production

Data collected by UTRGV's Center for Sustainable Agriculture and Rural Advancement (SARA) suggests that citrus fruit from the Lower Rio Grande Valley is well suited for organic-wine production. SARA used RGV citrus to produce 10 side-by-side batch trials of grapefruit and orange wines. After detailed lab analysis of the 10 batches, all the citrus wine presented with no measurable Volatile Acidity (VA) and high amounts of both free and total sulfur dioxide (SO₂). VA is a measure of the wine's volatile or gaseous acids, primarily acetic acid, which is the primary acid associated with the smell and taste of vinegar. Free SO₂ acts as an antimicrobial antioxidant in wine. "I've never seen grape wine with no measurable VA. It would appear that the very high naturally-occurring levels of free SO₂ in citrus wine prevent the growth of acetobacter bacteria and other unwanted microbes," observes SARA co-director George Bennack, "this means that sulfites probably don't have to be added to these citrus wines, which could allow the wines to be made certified organic, if certified-organic citrus fruit is used." However, citrus wine has a very sulfurous aroma and UTRGV taste trials have shown that many people do not like the taste. "The sulfurous

taste, it's an acquired taste...and most people have not acquired it yet," quips Bennack. For more information on wine research, view the UTRGV video and article at <https://www.utrgv.edu/newsroom/2019/01/24-utrgv-researcher-makes-bold-fruit-selections-for-wine.htm>.

Outreach & Extension

9. UTRGV hosts field day through its Subtropical Soil Health Initiative

UTRGV hosted a field day on November 15 through its Subtropical Soil Health Initiative (SSHI), which is sponsored through a USDA-NRCS Conservation Innovation Grant and is operated in partnership with the National Center for Appropriate Technology (NCAT). The Initiative centers on participatory research with local organic farms and focuses on the impact of cover crops on soil health and other ecosystem services. The project draws from the strengths of various SARA-affiliated faculty and involves graduate students in the master's program in Agricultural, Environmental, and Sustainability Sciences. Topics discussed during the field day, held at Hilltop Gardens, included cover-crop management techniques, soil health, and on-farm biodiversity. For more on the Subtropical Soil Health Initiative, watch this short video at https://youtu.be/va_N03Si02k. Or contact Dr. Alex Racelis at alexis.racelis@utrgv.edu.

10. Church land rezoned for use as a sustainable urban farm

In a very rare move, the City of Edinburg rezoned five acres of land, owned by the Edinburg First United Methodist Church, from Suburban Residential Uses to Agriculture Uses during the Edinburg City Council Meeting on January 3. The land is located west of the UTRGV Edinburg campus near the Methodist Church at 3707 West University Drive. This rare move by the Edinburg City Council clears UTRGV and the Methodist Church to establish a Memorandum of Understanding (MOU) allowing The University to use the five acres of land to develop a sustainable urban farm that can be used for research and demonstration purposes. During recent years, urban agriculture has become more popular as consumers become more interested in buying local and sustainably created foods. SARA co-director Dr. Alex Racelis has spearheaded efforts to use this land as "a working urban farm and the cornerstone of a sustainable and fair food system, with the ultimate goal of being a training and experiential-learning site for students studying sustainable agriculture, environmental sciences, and sustainability at UTRGV" states Racelis. For more information about the development of this urban farm, please contact Dr. Alex Racelis at alexis.racelis@utrgv.edu.

11. SARA's 2017 Annual Report drafted and added to the Center's website

AESS (Agricultural, Environmental, and Sustainability Sciences) graduate students Allison Kaika, Joy Youwakim, and Matthew Kutugata worked during the fall semester of 2018 to develop the 2017 Annual Report for SARA. This annual report covers the inception year for SARA and serves as a guide, or template, for the 2018 Annual Report that the three students are now developing. The three students will develop SARA's 2019 Annual Report during the fall semester of 2019. The 2017 Annual Report opens with a letter from co-directors Dr. Alex Racelis and George Bennack, provides SARA's purpose and mission, and follows with information on organizational structure, research, and other activities, financial information, and impact. Please link into SARA's website at www.utrgv.edu/sara to review the 2017 Annual Report and provide feedback to dahlia.vela@utrgv.edu.

12. SARA works with cooperative to support health and local food systems

SARA's Texas Rural Cooperative Center (TRCC) is helping a group of small-scale farmers in Hidalgo County to form a cooperative that will serve the *Farm-to-Health* initiative at Doctor's Hospital at Renaissance.

Staff from UTRGV's Center for Sustainable Agriculture and Rural Advancement (SARA) worked with the producers and UTRGV graduate students to help get the *Frontera Farmers Coalition (FFC)* cooperative up and operating. This cooperative will allow individual small-scale farmers to supply fruits, vegetables, and protein directly to employees at Doctors Hospital at Renaissance. This bag of farm-fresh produce—commonly known as Community Supported Agriculture (CSA)—is a model that improves family access to healthy food while supporting the financial sustainability of local farms. For more information on SARA's participation in this program, please contact Juan Raygoza at juan.raygoza@utrgv.edu or Colin Cain at colin.cain@utrgv.edu.

13. TRCC leads cooperative panel discussion for City of Austin

UTRGV's Texas Rural Cooperative Center (TRCC), a SARA program, participated in a cooperative panel discussion in Austin on February 12. TRCC's Annelies Lottmann moderated the panel discussion on cooperative entrepreneurship. The City of Austin hosted this unique public event, where the four-member panel discussed the benefits of a cooperative business structure. Panelists provided details of how they financed their co-op, how they manage their co-op, and how to convert your business into a cooperative. Public support for co-ops is growing in the Austin area, in part because of the statewide work of SARA and UTRGV's Texas Rural Cooperative Center.

In addition to Ms. Lottmann, the panel included experts from a range of co-op types. Experts included: Dan Gilotte, General Manager of Wheatsville Co-op, Texas's only grocery cooperative, which has been in continuous operation since 1974; Andi Shively, co-founder of Key Figures Bookkeeping Co-op, a nationally recognized bookkeeping services provider based in Austin, which specializes in cooperatives and their unique needs; Andrea Harrington, who heads up the Legal Assistance For Microenterprises Project at Texas Rio Grande Legal Aid, and is one of the foremost legal experts on the cooperative model in the state. This panel is anticipated to be the first of many to come as TRCC engages more with municipal and nonprofit partners around the state. For more information on cooperative development, contact Colin Cain at colin.cain@utrgv.edu.

14. TRCC plans summit in support of cooperative-driven food systems

UTRGV's Texas Rural Cooperative Center (TRCC), a SARA program, plans to convene a summit this summer in central Texas that will include five farmers' cooperatives and five co-op businesses that purchase locally-grown food. The summit aims to identify challenges and opportunities to growing the cooperative economy in the central-Texas region. With the support of the Texas Rural Cooperative Center, new cooperatives are forming each year, and now TRCC is creating more opportunities for co-ops to access economies of scale to help small farms succeed. This unique effort will provide a model for cooperative development in South Texas and other regions in the state and the country. For more information on this planned summit, contact Colin Cain at colin.cain@utrgv.edu.

15. TRCC provides technical assistance and leadership training to new cooperative

UTRGV's Texas Rural Cooperative Center (TRCC), a SARA program, will be providing technical assistance and leadership training to a startup homecare cooperative this spring in Bexar County. Led by Domesticas Unidas, a union for domestic workers, a coalition of municipal and nonprofit partners have come together to build the framework for a worker-owned homecare business. Caregivers have already begun receiving free training in homecare best practices through TRCC. In addition to advising and providing technical assistance in the start-up phase, TRCC staff will provide cooperative leadership training to the worker-owners of the emerging business. This will be the second homecare cooperative in Texas; both startups being assisted by TRCC. For more information on forming a cooperative business, contact Colin Cain at colin.cain@utrgv.edu.

16. SARA collaborates with the SBA to introduce agriculture business opportunities to veterans

UTRGV's Center for Sustainable Agriculture and Rural Advancement (SARA) is participating in the *Boots to Business Reboot: Introduction to Entrepreneurship Workshops* with the U.S. Small Business Administration (SBA) to help educate veterans on the financial and technical assistance resources available to them from USDA, TDA, SARA, and other agricultural organizations. Carlos Lago, a SARA program director, participated February 22 in McAllen at the RGV Hispanic Chamber of Commerce in *Module 8: Moving Forward: Resources to Support You* with the presentation "Veterans in Agriculture". Future events are scheduled for May 10 in Harlingen, August 16 in Mission, and November 8 in Edinburg. For information on this collaboration to assist Veterans, contact Carlos Lago at carlos.lago@utrgv.edu

17. Video showcases Texas Hispanic Farmer and Rancher Conference

The Texas Hispanic Farmer and Rancher Conference was held on December 6 and 7 at the Casa de Palmas Renaissance Hotel in McAllen, Texas. The two-day conference brought together the Hispanic farming community, the agriculture industry, advocates for sustainability, and agribusinesses for workshops, networking, and learning. Primary sponsors for the conference included USDA Natural Resources Conservation Service (NRCS), the National Center for Appropriate Technology (NCAT), and Southern Sustainable Agriculture, Research, and Education (SARE), with UTRGV's Center for Sustainable Agriculture and Rural Advancement (SARA) playing a strong supporting role in the conference. SARA captured this unique event in a promotional video that can be viewed at https://youtu.be/X_tjSPFTbtU

18. NRCS-funded hoop house christened with training event

Construction of the NRCS-funded high-tunnel hoop house ended with a two-day workshop January 29 and 30 on hoop-house construction and usage. Day 1 of the event began with a welcome by SARA co-director Dr. Alex Racelis, and continued with finance programs, style options, construction, soil preparation, and irrigation and trellising systems. Day 2 included training on planting schedules, food safety, marketing, and pest management. This training event was sponsored by USDA Natural Resources Conservation Service (NRCS) and much of the high-tunnel training was provided by SARA-affiliated faculty and staff. For information on high-tunnel hoop-house training, contact Juan Raygoza at juan.raygoza@utrgv.edu.

19. SARA staff assist with student training in sustainable agriculture

SARA staff members Juan Raygoza and Cruz Salinas assisted with student training for coursework in CESL 3301 by providing training in organic gardening on February 8 and in drip irrigation on February 15. This training by SARA staff prepared UTRGV students involved in community-engaged scholarship and learning (CESL) to assist with the development and improvement of organic gardens in low-income neighborhoods called 'colonias'. To provide this assistance with organic gardens, CESL students are partnering with the community organization LUPE, La Union Del Pueblo Entero, which was founded by labor-rights activist Cesar Chavez and Dolores Huerta. After students are trained, they will join forces with LUPE to help 'colonia' members set-up community gardens during class field days in March. Instructors for this course include Drs. Engil Pereira, James Jihoon Kang, and Mirayda Torres-Avila. For more information on this course, contact James Kang at james.kang@utrgv.edu. For information on training available for organic gardening and drip irrigation, contact Juan Raygoza at juan.raygoza@utrgv.edu.

20. Rio Farms Grape Growing & Wine Festival scheduled for end of month

The 2019 Grape Growing & Wine Festival is scheduled for Saturday, March 30 at Rio Farms, Inc. in Mote Alto, Texas, which is about 20 miles northeast of Edinburg. The annual conference is sponsored by Rio Farms, Inc., a research farm headquartered at Monte Alto, and will be held at their headquarters and neighboring vineyards. The event will last from 4 p.m. until 8 p.m. and will include an educational meeting

followed by a wine tasting. UTRGV is involved in grape, wine, and citrus research with Rio Farms, Inc., and UTRGV's Center for Sustainable Agriculture and Rural Advancement (SARA) participates in this grape growing and wine festival each year. For more information, contact SARA co-director George Bennack at george.bennack@utrgv.edu

SARA Staff in the News

Dahlia Vela and Cati Resto attended a NIH Grant Administration Workshop on Monday, February 25 to learn more about sponsored-research administration. Annelies Lottmann and Colin Cain attended the Texas Organic Farmers and Gardeners Association (TOFGA) Annual Conference, held in Corpus Christi on February 14 – 16, to learn more about organic farm and food production in Texas, and for industry networking opportunities. Cruz Salinas attended the Southern Sustainable Agriculture Working Group (SSAWG) Annual Conference in Little Rock, Arkansas on January 22 – 25 to learn more about organic fruit and vegetable production. Carlos Lago presented his project poster at both the SSAWG and TOFGA conferences, promoting agriculture training for socially-disadvantaged and Veteran farmers and ranchers. George Bennack attended training on winery facilities on November 12 and 13 in Fredericksburg.