

Enhancing Agri-Education and Diversity through Multistate Collaborative Approach

Mahadev G. Bhat, Krishnaswamy Jayachandran, Kateel Shetty, Amir Khoddamzadeh, Maruthi Sridhar Balaji Bhaskar, and Cara Rockwell

*Agroecology Program
Florida International University, Miami*



A Community of Ecosystem Services
Conference, Austin, TX, December 10, 2024

- **56,000 students**
- **~90% minority (Hispanic and Black)**
- **More than 300 academic programs**
- **Largest Hispanic students graduation**

- **Metropolitan city**
- **Surrounded by more than 65,000 acres of agricultural land**



Agroecology Program at FIU

Develop Agro-ecology and Environmental Science-focused curricula

Pipeline students from high school, through 2-yr, 4-yr college, graduate school and onto profession

Provide experiential & professional training

Facilitate placement in USDA, agriculture and related industries



Equitable access

Affordability

Workforce diversity



Our Strategies for Success

Collaboration

Resource Leverage

Innovative Programs

Student mentoring

Building Collaborations



Academic Collaborators funded through the grant



Resource Leveraging

Florida International University – Agroecology Program Growth



2005

- 1st HSI grant
- Agroecology Certificate approved

2006

- Two new agri-science courses
- 1st ISE & 1st MSP grants
- Summer K-12 Teachers' workshop

2007

- Campus Organic Garden, Shadehouse and Agroecology Lab

2008

- 2nd HSI grant
- 2nd ISE grant
- Campus Organic Garden Expansion
- Agroecol Symposium

2009

- 2nd MSP grant
- 1st NNF grant
- High school internships
- Recruit grad students into Agroecology

2010

- 3rd HSI grant for biofuel science training
- India study abroad field course
- Annual Agroecology Symposium

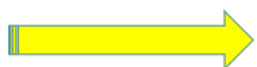
2011

- Collaboration HSI grant – FIU, MDC, STU and Inter-American Univ collaboration
- Outstanding thesis award at AAHHE for students

2012

- 3rd MSP grant
- JP Morgan Chase Found. Grant for High School Education Effect project
- FIU gets USDA HSACU designation

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2013

- 2nd NNF grant for masters
- USDA agricultural internships
- 2 week Costa Rica field course – visit to CATIE w/ 15 students

2014

- 4-day National USDA HSI Agri-science conference in Miami – 125 participants
- 1st 2501 grant – Socially disadv. farmers training
- Private farmers network for training
- 4th MSP grant

2015

- New BS Agri-science major
- 2nd Collaborative grant with NMSU & UTRGI
- 3rd NNF grant
- 2nd 2501 grant
- Prof. Hort. Workshops
- Intr! Agroecol Workshop
- First org. farm by 2501 apprentice

2016

- 3rd HSI collaboration grant-MDC/STU/ IAU
- 5 new agri-courses
- HSI Collaboration with Texas A&M, Kingsville
- 5TH MSP grant
- Student placement at USDA via onsite hiring



- 4th HSI Collob. grant w/ NMSU & UTRGV
- USDA SARE grant
- 6th MSP grant
- 4th NNF grant
- START-NOW2 HSI w/ Texas A&M
- Intr! field course in Costa Rica

2021

- Specialty crop grant
- Green Point - industrial hemp research grant
- 5th 2501 grant
- Florida Tomato/ berry Supply chain symposium
- 14th annual Agroecology sympo.

2020

- Visit to CIAT, Colombia
- Organic garden expansion
- International field course in Costa Rica
- Two Outstanding thesis awards from AAHHE

2019

- 4th 2501 grant
- Walmart Foundation research grant for Florida tomato /berry industry supply chain
- International field course in Costa Rica

2018

- 3rd 2501 grant
- 3-year NIFA Beginning Farmers grant
- FAS Cochran Fellowship program – for Moldova group
- International field course in Costa Rica

2017



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2022

- 5th HSI Collabn. grant with MDC, STU & IAU
- USDA Conservation Innovation grant
- USDA Specialty Crops – Citrus Greening grant
- Intl field course in Costa Rica
- 1st USDA REEU grant summer program

2023

- MOU with Modern Canna Labs for industrial hemp research
- Collaborative Online Intl Learning course on GIS with Univ of Almeria, Spain
- Intl field course in Costa Rica
- Summer USDA REEU grant workshop
- 15th Annual Agroecology Symposium

2024

- 6th 2501 grant for farming incubation for under represented farmers
- NRCS urban agri research grant
- HSI grant in collaboration with Texas State University
- HSI grant in collaboration with Florida Atlantic University

2025 ...



Innovative Programs

Purposeful and intentional recruitment

**Diverse
body of
students**



**Open houses &
Class visits**



**Proactive K-12
Programs help
recruit
students**



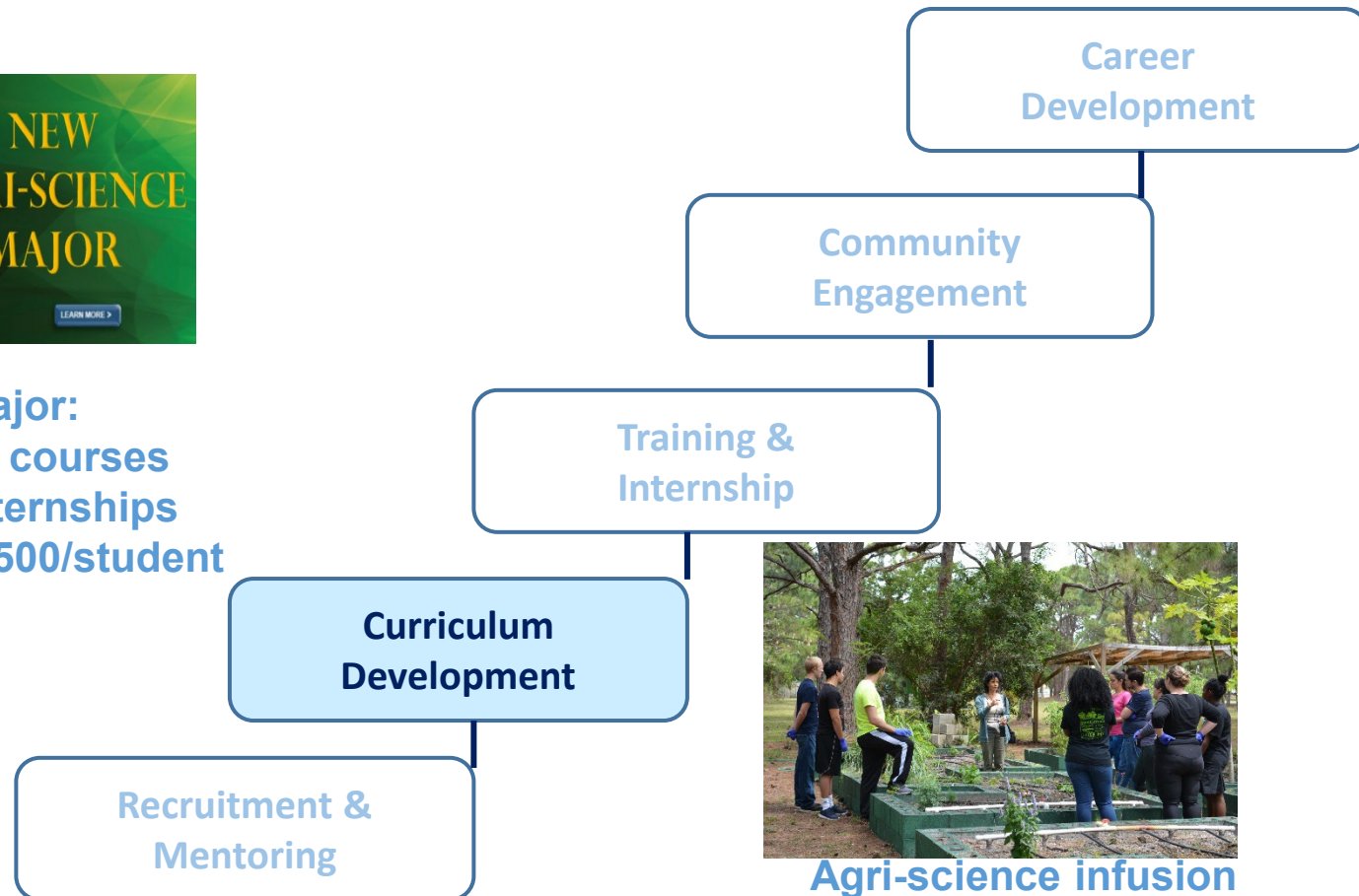
Curriculum Development

Each institution has developed new agri-science major, new courses or new workshops



New agri-science major:

- 8-10 agri-science courses
- For credit agri-internships
- Scholarship ~ \$4500/student



Agri-science infusion
Into existing classes

Training & Internship

Intensive summer internship & hands-on training ...



Summer internships:
Beltsville ARS,
HACU internships
Costa Rica
ARS Miami
Costa Rica &
Miami private farms



Undergraduate
research
& training

Community Engagement

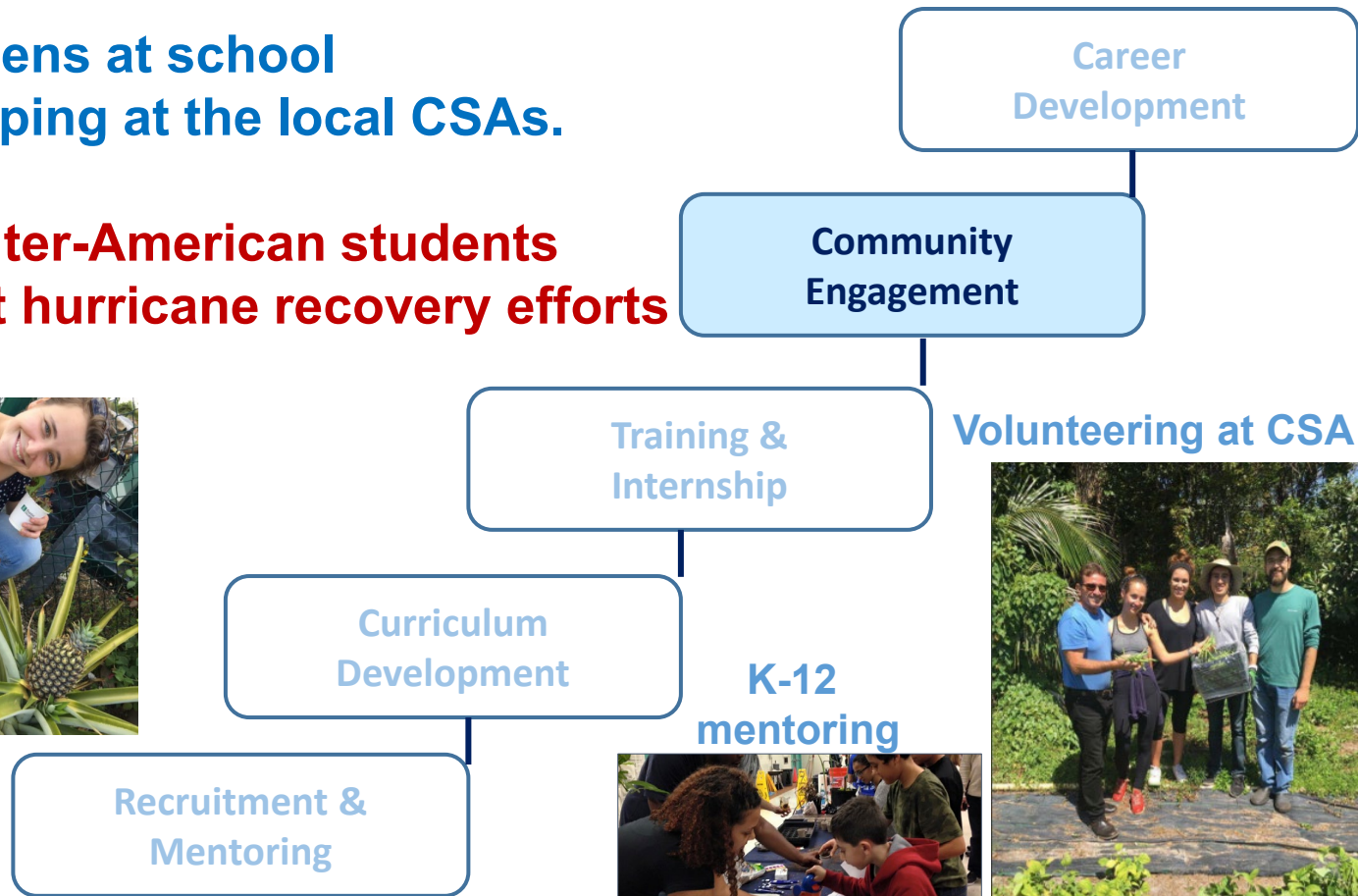
Our students are involved in a variety of engagement projects

From building gardens at school & hospitals...to helping at the local CSAs.

Special mention: Inter-American students participated in post hurricane recovery efforts

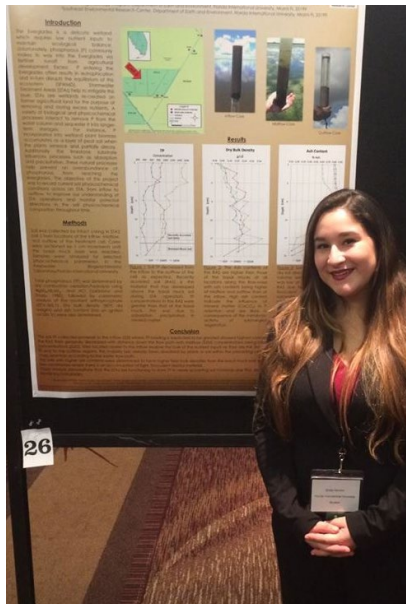


Hospital garden building

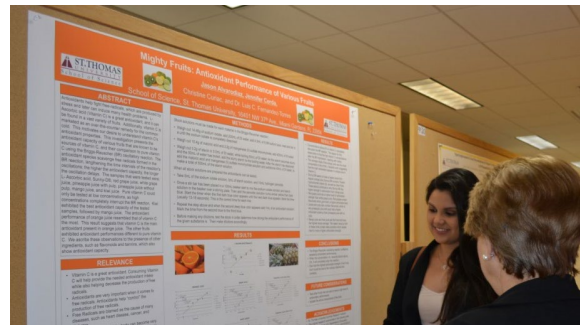


Career Development & Higher Education

Professional networking conferences to career training workshops...



Local, regional and National workshops



Resume building & Pathway application Workshops....

Career Development & Higher Education

Placing students in USDA career and higher education...



Hired by USDA

FSA

ARS



Higher Education

Community Engagement

Training & Internship

Curriculum Development

Recruitment & Mentoring

Heading to University of Florida for PhD with a full ride



Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv



Ecological-economic assessment of the effects of freshwater flow in the Florida Everglades on recreational fisheries



Christina Estela Brown^a, Mahadev G. Bhat^{a*}, Jennifer S. Rehage^a, Ali Mirchi^b, Ross Boucek^c, Victor Engel^d, Jerald S. Ault^e, Pallab Mozumder^f, David Watkins^f, Michael Sukop^g

Program Impacts on Students by the Numbers



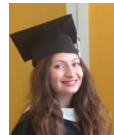
Students internships with USDA grant support (~250)



USDA Career placement in FAS, ARS, NRCS (~20)



Students graduated with USDA support (~600)



Masters & PhD students graduated from FIU with USDA support (~35)



Advancing to other graduate schools for masters & PhDs (~20)



AAHHE best thesis awards (4)



Organic Garden (1) & Agroecology, Soils and Plant labs (4)



Summer Agroecology workshops for K-12 teachers (6 years)



Summer Internships for High School students (70 interns over 15 years)

2020 Agroecology Symposium
Future Climate Change and Implications for U.S. and Florida Agriculture

Featuring



Dr. Steven McNulty
 Director of Southeast Regional Climate Hub,
 U.S. Department of Agriculture



Ms. Holly Bell
 Director of Cannabis,
 Florida Department of Agriculture
 and Consumer Services

Monday, March 23rd, 2019
GC 243 | Modesto Maidique Campus
Florida International University

- ~ 70% Hispanic
- ~ 85% all minorities
- ~ 60% female students
- ~ more than 90% graduation rate

Annual Agroecology Symposium
 14 years in a row since 2006, showcasing students research, internships, engagement and leadership

Examples of High Quality Research & STEM Education

CASE News
The College of Arts, Sciences & Education

Arts + Culture Education Environment Science + Health Spotlight Student Life Opportunities


Earth Systems Science Ph.D. student continues her STEM journey

Written by **Contributing Writer**
April 7, 2020

Share

By Ashley Garcia

Christina Estela Brown is a postdoctoral scholar with the National Center for Integrated Coastal Research and the Department of Tourism, Events & Attractions in the Rosen College of Hospitality Management at the University of Central Florida.

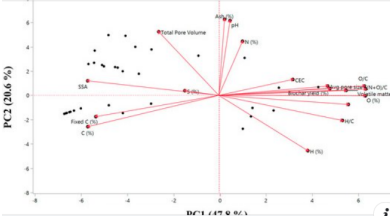


Brown received a Ph.D. in Earth Systems Science from FIU in 2019. She wanted to study environmental and ecological economics, but also wanted a deep understanding of the ecosystems she was studying. The Earth Systems Science program, she says, "gave me an opportunity to really develop a transdisciplinary framework for understanding socio-ecological systems."

Dr. Christina Brown, FIU graduate, 2019
Research Economist, **USDA Economic Service**, Kansas City, KS

Krish Jayachandran
April 9 at 8:51 AM

Congratulations to Shagufta Gaffar for publishing her first paper in Agronomy. This is a trans-disciplinary collaborative research among Environmental Scientists, USDA-ARS, and Mechanical Engineering to elucidate role of Biochars in maintaining Soil Health, Carbon Sequestration, and Climate Change mitigation.



MDPI.COM
Physiochemical Characterization of Biochars from Six Feedstocks and Their Effects on the Sorption of Atrazine i...

agronomy

Physiochemical Characterization of Biochars from Six Feedstocks and Their Effects on the Sorption of Atrazine in an Organic Soil

by Shagufta Gaffar Sanku Dattamudi Amin Rabiei Baboukani Saoli Chanda Jeffrey M. Novak Donald W. Watts Chunlei Wang Krishnaswamy Jayachandran

Over 500 conference/symposia presentations, refereed publications and popular articles from students and faculty

JOURNAL OF SOIL AND WATER CONSERVATION
The science and art of natural resource management for sustainability

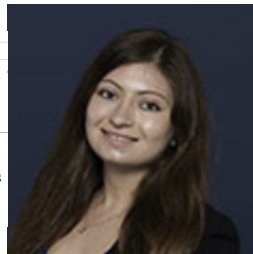
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Research Article | Research Section

Adoption and perception of cover crop implementation for tropical fruit growers

A. Freidenreich, M. Bhat and K. Jayachandran
Journal of Soil and Water Conservation December 2021, 00084. DOI: <https://doi.org/10.2489/jswc.2022.00084>

[Click here for the full article](#)



Dr. Ariel Freidenreich, FIU graduate, 20120, Research Scientist, **USDA Agricultural Research Service**, Nebraska



CASENEWS.FIU.EDU
Student works to save endangered orchids with friendly fungi

[Click here for the full article](#)

[Click here for the full article](#)

EconPapers
Economics at your fingertips

A Game-Theoretic Model of Crop Flood Indemnity in South Florida

Christine E. Brown and Mahadev Bhat

No 274470, 2018 Annual Meeting, August 5-7, Washington, D.C., from Agricultural and Applied Economics Association

Keywords: Risk and Uncertainty; Natural Resource Economics; Resource and Environmental Policy Analysis (search for similar items in EconPapers)

Date: 2018-06-20

New Economics Papers: this item is included in [nep-gth](#)

References: [View references in EconPapers](#) [View complete reference list from CitEc](#)

Citations: [View citations in EconPapers](#) (1) [Track citations by RSS feed](#)

Student Professional & Leadership Development



CASENEWS.FIU.EDU

Ph.D. student's trip to DC to discuss agricultural policies

Photo courtesy David Riera While students were unwinding from th...

David Riera is a McKnight Doctoral Fellow at FIU College of Art, Sciences, and Education; Also served as **Graduate Vice President at National MANRRS, Region II**, [MANRRS](#)



2012 MANRRS Conference held in Atlanta



FIU Agroecology Program

October 7, 2020

An important article was written by Dr. Amir Khoddamzadeh and FIU Alumna, Karina Suarez about a close relationship between local farmers and individual families.



SOUTHDADENEWSLEADER.COM

Farmers struggle during the pandemic

Food security is the most pressing concern in the post-COVID-19 w...

Student Professional & Leadership Development

NASA Artemis Innovative New Designs for Space Competition

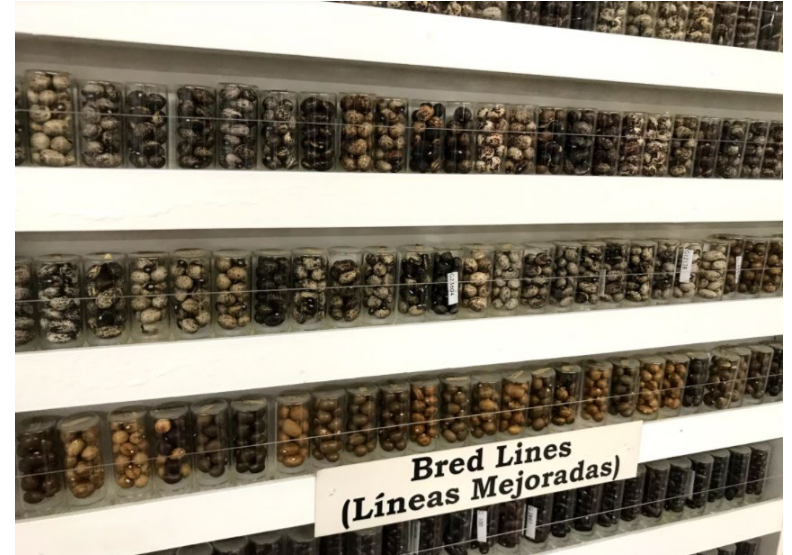
A team of **undergraduates** from FIU won **\$1500 grant** from the NASA's Minority University Research and Education Project (MUREP) Innovative New Designs for Space (MINDS) - a multi-semester undergraduate design competition to develop self-sustaining **greenhouse production on the Moon**

One of the 50 finalists competition for a prize of \$5000

Student Team: Kyle Dalie, Alicia Maratos, Marcos Garcia, Kevin Lewin, Katherine Delarosa, and Rodolfo Beguiristain.



International Travel



More than 20 international field courses & student research travels

Private Agri-Industry Jobs



Alexander Puentes student of FIU Sustainability BA Degree , started as an intern at a private Climate Controlled Agriculture production farm and later got hired as a full-time manager

Prestigious Awards & National Honor



Jessica Dominguez

Works on citrus greening disease, under **Dr. Kateel Shetty's** advice, trying to find naturally occurring antimicrobial bacteria to control the disease.

Won the **FIRST PRIZE** for the **Outstanding Master's Thesis** in 2019 from **AAHHE**

Now in her 2nd year of PhD at FIU



FIU Agroecology Program

January 14 · 🌐



FIU is ranked #1 University "Where You Can Make A Difference in the Climate Crisis. Great article where Dr. Amir Khoddamzadeh and Graduate student Ellen Garcia were interviewed.

<https://www.collegemagazine.com/top-10-colleges-where.../>



COLLEGEMAGAZINE.COM

Top 10 Colleges Where You Can Make A Difference in the Climate Crisis



Ellen Garcia

BS, MS and now going into PhD with a McKnight Doctoral Fellowship

Works on climate change and endangered orchids

Featured in *College Magazine*, which ranked FIU as **Number 1 University** for Environmental Science Program focused on climate crisis

2501 Program & Beginning Farmers and Ranchers Programs

FIU MAGAZINE

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Cultivating success: FIU supports growing community of military veterans, minorities interested in farming business

Posted by Contributing Writer | 12/14/2015 at 8:00 am

New farms and farming businesses by socially disadvantaged farmers and veterans (25)

More than 100 farmers assisted with USDA grants and loans applications



PETER ANDREW BOSCH/MIAMI HERALD STAFF

DREAMING OF ACAI: Navy veteran Mat Santos, 26, stands on the seven acres of land in Miami-Dade that he and his father purchased in January. With FIU's help, Santos is learning the world of farming.

Best Practices

- ✓ **Motivate students to define their goals & align research and professional activities**
- ✓ **Identify good mentors within the department & college and off-campus**
- ✓ **Emphasize skills necessary to succeed in the profession -- publications, communication, networking, leadership skills**
- ✓ **Institutional collaborations**

Acknowledgement

Drs. Irma Lawrence, National Program Leader, HSI, USDA

**Institutional Collaborators from STU, IAU, MDC, TAMUK,
NMSU, UTRG, FAU, Tx State University**

Local USDA agencies

National USDA offices, NIFA, OPPE, NRCS, ARS

**2022 USDA NIFA HSI Higher Education Program
(Grant # 2022-77040-37619)**

