



ORGANIC FARMING RESEARCH FOUNDATION

Fostering the improvement and widespread adoption of organic farming.

Statement of Thelma Vélez, PhD

**Research & Education Program Manager, Organic Farming Research Foundation
House Committee on Agriculture**

June 15, 2022

Chairman Scott, Ranking member Thompson, and distinguished members of the House Agriculture Committee, I would first like to thank you for hosting a hearing on agricultural resilience and climate research, and providing an opportunity to share my expertise on this important issue.

I have been involved in agriculture and food systems research for over 15 years, including various projects working with USDA programs and offices and alongside pioneers in sustainable agriculture within the Land Grant University system. I have a PhD in Environment and Natural Resources from the Ohio State University's College of Agriculture, Food, and Environmental Sciences. My research background is highly interdisciplinary. I have conducted agronomic experiments to help South Florida farmers sequester carbon and enhance soil fertility using biochar, I have researched and worked with farmers building resilience to a changing climate in the Caribbean, specifically in Puerto Rico post-Hurricane Maria, and have collaborated with multidisciplinary teams across the U.S.

I am speaking to you today on behalf of the Organic Farming Research Foundation (OFRF) where I am the Research and Education Program Manager. OFRF has been working for over three decades to expand the research being done on organic production systems. We work closely with researchers, organic farmers, and policy makers across the U.S. to understand the challenges farmers face, and to provide the research and education tools needed to help them thrive.

Our changing climate, and the disruptions in weather patterns it brings, present new and intensifying challenges to farmers. In our recently published 2022 National Organic Research Agenda (NORA), we received responses from over one thousand certified organic growers across the U.S. to produce a 230-page report identifying the needs of our domestic growers. Over half of these farmers were concerned with adapting to climate change. In listening sessions, they discussed challenges such as unpredictable precipitation, including increased flooding and prolonged periods of drought, earlier and

later frost dates, and changing pest challenges (Snyder, Schonbeck, Vélez, 2022). All of these challenges alter planting and growing cycles, negatively impact the stability of farms, and expose the fragile nature of our current food system, which ultimately threatens national security (ibid; Petersen-Rockney et al., 2021).

Despite these challenges, we know that organic growers lead the nation when it comes to climate resilience, climate adaptation, and climate mitigation. Organic growers regularly implement climate-smart practices that build healthy, fertile soils. Soil is the foundation of our farms, and healthy soils have increased capacity to hold plant-available water and nutrients, suppress pathogens, and support vigorous crops and pasture. To build soil health, nearly 90% of organic farmers plant cover crops regularly, compared to just 10% of conventional farmers (Snyder, Schonbeck, Vélez 2022). Other practices organic growers lead the way in are crop rotation, intercropping, and green manures, all of which are research-backed methods to improve resilience and increase fertility (ibid). Organic farming is the original climate smart agriculture, and continues to lead the way.

OFRF has spent the past 7 years researching and reviewing the literature to better understand the importance of soil health to climate resilience and mitigation. We have carried out this work with grants and through a partnership agreement with USDA NIFA. In reviewing the existing research, we found that there is extensive evidence showing organic production systems help farmers in various ways, including: increasing resilience to climate stress, such as droughts and floods, enhancing soil fertility and protecting against soil erosion, supporting increased biodiversity, and increasing soil carbon sequestration services. For example, in the case of extended drought, studies show that cover crops can reduce irrigation needs anywhere from 33%-50%, particularly when using integrated strategies such as diversified rotation, reduced tillage, and compost application (Gaudin et al., 2018; Renwick et al, 2017; DeVincentis, 2019). Relatedly, organic agriculture systems have been found to decrease soil loss rates due to erosion, with soils under organic management having greater aggregate stability while increasing water infiltration rates (Morvan et al. 2018). Research has found that biodiversity on organically managed lands have higher rates of both species richness and abundance when compared to conventional cropping systems (Stein-Bachinger 2021). With respect to climate mitigation, research indicates that organic farming systems can sustain higher levels of soil organic carbon (SOC) and have lower per-acre GHG emissions than conventional systems (Schonbeck 2020; Crystal-Ornelas, Thapa, & Tully, 2021). There are multitudes of studies describing the importance of organic production systems in addressing both current and emerging climate challenges.

While the organic method has been shown to have great potential to contribute to both climate mitigation and climate resilience, much more action-oriented research is needed to make widespread adoption possible. Less than 1% of the USDA's annual research budget is spent on organic production topics, which is not aligned with the organic sector's continually growing market share of 6%. Organic farmers need greater research investment to continue to advance soil health and fertility management to better sequester carbon and reduce GHG emissions. To reduce risk and enhance resilience, they also need improved crop cultivars specific to organic production systems, including traits like disease-resistance, nutrient efficiency, seedling vigor, and competitiveness toward weeds. We at OFRF believe it is crucial for Congress to recognize and elevate USDA-certified organic agriculture as a climate-smart and -resilient system of production and provide the resources to meaningfully meet the need of organic producers. This is in line with Secretary Vilsack's recent comments when presenting the Food System Transformation Framework.

Moving forward, more research, education, and extension is needed to help farmers and ranchers implement the best practices for climate mitigation and adaptation specific to their operations and locales. This includes breeding regionally adapted crop cultivars and identifying the best cover cropping systems for specific regions and production systems. We also need to advance organic research on advanced grazing management and crop-livestock integration which are known to sequester carbon, reduce greenhouse gas emissions, and enhance climate resilience of livestock production systems. Further, we believe it is imperative to increase funding not only for existing organic research programs, but also integrate organic research into other research programs across the USDA's portfolio. Increasing mandatory funding for NIFA Organic Research and Extension Initiative (OREI), while also expanding the amount of organic research within the ARS, such as work underway at Long Term Agroecosystem Research sites, is imperative. Alongside investing in the research, investment in Extension and education is essential to getting new research-informed skills, tools, and technology into the hands of growers. Cooperative Extension programs have been historically underfunded, and organic producers are often at an additional disadvantage because the organic expertise of Extension agents is currently lagging. Therefore, we also recommend expanding technical assistance resources and Extension services available to organic growers.

In conclusion, these are challenging times for the people who grow our food. American farmers are no strangers to challenges, from the Dust Bowl to the 1980s farm crisis, but the scale of challenges facing our farmers are unprecedented. Destabilizing climate conditions only contribute to continually thinning margins and market disruptions that negatively impact the health of our agriculture industry. We deeply appreciate the USDA funding research, education, and extension that is crucial to helping farmers build

resiliency. The Sustainable Agriculture Research and Education (SARE) program, the Organic Research and Extension Initiative (OREI) and the Organic Transitions Program (ORG) have supported hundreds of studies that help both organic and conventional farmers address the threat of climate disruption. But, there is still much more investment needed to meet the needs of our farmers if we want to make meaningful progress on mitigating and adapting to climate change. Thank you for all of the great work you have done so far and the work you continue to do. I welcome any questions the committee may have on climate research and organic production.

Condensed Recommendations

Recognize and elevate USDA-certified organic agriculture as a climate-smart and resilient system of production.

- Research:
 - Increase funding for organic research programs administered by the National Institute for Food and Agriculture (NIFA), including the Organic Research and Extension Initiative, Organic Transitions Program, and the Sustainable Agriculture Research and Education (SARE) programs. These programs are ideally positioned to help producers sustain and increase production while contributing to climate adaptation and mitigation through expanded research in organic agriculture and food systems
 - Continue and expand research funding through the Agriculture Research Service's Long Term Agroecosystem Research (LTAR) Network. For example, organic systems research at the long term organic trials at the Beltsville, Maryland research station can be a model for expanding LTAR programming. This long-term research will continue to be critical in preparing farmers and ranchers, both organic and non-organic, to adapt to and mitigate the changing climate.
 - Fund organic farming research at levels commensurate with organic's market share. This will require at least a six fold increase that could be spread out over several years. We believe that increasing funding for organic research, building on the recently-released ARS strategic plan for organic research, will help the agency address this historical lack of investment in organic agriculture research and help organic and non-organic producers alike overcome challenges to realize their potential to adapt to and mitigate the impacts of the changing climate.

- Extension and Education:
 - Expand Extension services available to organic growers. Extension is essential to delivering new skills, tools, and technology into the hands of growers. As a country we are under-investing in Cooperative Extension programs, and organic producers are at an additional disadvantage because the organic expertise of Extension agents lags significantly.
 - Increase the level of coordination between USDA's research agencies and programs with their technical assistance agencies. Farmers depend on the continued and expanded capacity of NIFA and ARS to continue effectively sharing key research findings with NRCS and other technical assistance-focused agencies, so they can support the adoption of best practices and sustainable systems of production.

Thelma I. Vélez, PhD

LinkedIn: <https://www.linkedin.com/in/thelmavelezphd>

EDUCATION

Ph.D. Environment and Natural Resources, 2021

The Ohio State University

Focal Areas: Climate and Food Justice; Climate Resilience; Agroecology

M.S. Environmental Studies, 2012

Florida International University

Focal Areas: Carbon Sequestration; Biochar; Agroecology; Soil Science

B.A. Sociology/Anthropology, 2010

Florida International University

Focal Areas: Sustainable Food Systems; Resource Conservation

PROFESSIONAL APPOINTMENTS

Research and Education Program Manager, 2021- present

Organic Farming Research Foundation

Project Management Assistant, 2020-2021

The Ohio State University, Ohio Sustainable Agriculture Education Network

Adjunct Faculty, 2014-2015

Florida International University, Dept. of Earth and Environment

Agroecology Program Co-coordinator, 2011-2012

Florida International University, Agroecology Program

PUBLICATIONS

Vélez, Thelma. The Intersection of Climate Justice and Agroecology in Puerto Rico post Hurricane Maria. *Climate Justice in the Majority World*. Eds. C. Neil and M. Mikulewicz. Routledge. Forthcoming-Fall 2022.

Snyder, L., Schonbeck, M., **Vélez, T.** 2022 National Organic Research Agenda: Outcomes and Recommendations from the 2020 National Organic Survey and Listening Sessions. Organic Farming Research Foundation. <https://ofrf.org/research/nora/>

Vélez, Thelma, Moonilall, N., Reed, S., Scinto L. J., Jayachandran, K. 2018. Impact of *Melaleuca quinquenervia* biochar on *Phaseolus vulgaris* L. growth, soil nutrients, and microbial gas flux. *Journal of Environmental Quality*, 47(6), 1487-1495.

PUBLICATIONS cont.

- Vélez, Thelma** and Kerry Ard. 2019. Building an Edible City: Green Spaces in Rotterdam, the Netherlands. *Cities around the World: Struggles and Solutions to Urban Life*, Ed: Jing Luo. ABC- CLIO, Vol.2 pp 169-173.
- Vélez, Thelma**. 2019. So you're 'Latina, Latina': Positionality and Reflexivity in Scholar-Activist Praxis. *Journal of Latin American Geography*, Vol.18 (3), 215-220.
- Vélez, Thelma**. 2018. Treehugger Farm: Sustainability Visions in Urban Agriculture. *Palgrave Handbook of Sustainability Case Studies and Practical Solutions*, Eds. Sandra Garren and Robert Brinkman, Palgrave MacMillan, Ch.22, pp 411-429.
- Vélez, Thelma**. 2017. The changing politics of organic food in North America. Lisa F. Clark. *Agriculture and Human Values*, 34 (3), 781-782.
- Ard, K., Colen, C., Becerra, M., **Vélez, T.** 2016. Two Mechanisms: The Role of Industrial Pollution Exposure and Social Capital in Explaining Racial Disparities in Self-Rated Health. *Intl. Journal of Environmental Research and Public Health*, 13 (10), 1025-37.

CONFERENCES AND MEETINGS

Organizer/Presider

- 2022 **Vélez, Thelma**. Organic Agriculture Research Forum at EcoFarm. Remote.
Sessions: 1. Controlling Spotted Wing Drosophila Organically
 2. Soil Health on Organic Farms in the Central Coast
 3. Farmer to Farmer Panel on Soil Health
 4. 2022 National Organic Research Agenda
- 2019 **Vélez, Thelma** and Marko Salvaggio. Organizer and Presider. Indigenous Movements. Society for the Study of Social Problems. New York, NY.
- 2019 Salvaggio, Marko and **Thelma Vélez**. Organizer. Environmental Activism. Society for the Study of Social Problems. New York, NY.

Presentations

- 2022 **Vélez, Thelma**. 2022 National Organic Research Agenda: Understanding Grower Needs and Challenges across the U.S. <https://eorganic.org/node/35366>
- 2019 **Vélez, Thelma**. Toward Sustainable, Just Transformation: Agroecology and Climate Justice in Puerto Rico. Association of American Geographers. Washington, D.C.
- 2019 **Vélez, Thelma**. A Disaster as Catalyst for Mobilization: The Convergence of Climate Justice and Agroecology. American Sociological Association Annual Meeting 2019. New York, NY.

CONFERENCES AND MEETINGS cont.

- 2018 **Vélez, Thelma.** Building Resilience. Climate Justice and Agroecology in Puerto Rico. University of New Mexico- Latin American and Iberian Institute, Social Transformation in Latin America's Changing Climate. Albuquerque, NM.
- 2018 **Vélez, Thelma.** The Convergence of Climate, Environment, and Food Movements: Grassroots Mobilization of Frontline Communities post-Hurricane Maria. Society for the Study of Social Problems 2018 Meeting. Philadelphia, PA.
- 2018 **Vélez, Thelma.** Treehugger Organic Farm: Visions for a Sustainable Food System. Agriculture, Food, and Human Values Society Meeting 2018. Madison, WI.
- 2018 **Vélez, Thelma.** Growing Food Sovereignty. Agriculture, Food, and Human Values Society Meeting 2018. Madison, WI.
- 2018 **Vélez, Thelma.** Grassroots Mobilization on the Frontlines. American Environmental Studies Society 2018 Meeting. Washington D.C.
- 2017 **Vélez, Thelma.** The Wall: Not Another Brick in Our Food System. Agriculture, Food, and Human Values Society Meeting 2017. Pasadena, CA.
- 2017 **Vélez, Thelma.** Getting Sustainable and Just Food on Campus. Agriculture, Food, and Human Values Society Meeting 2017. Pasadena, CA
- 2016 **Vélez, Thelma** and Kerry Ard. Revitalizing Communities with Gardens: is it always rosy? 76th Rural Sociological Society Annual Meeting. Toronto, Canada.
- 2012 **Vélez, T.**, Reed, S., and Jayachandran K.. Measuring the Impact of *Melaleuca quinquenervia* Biochar Application on Soil Quality, Microbial Gas Flux, and Plant Growth. Soil Science Society of America Annual Meeting. Cincinnati, OH,

INVITED ENGAGEMENTS

- 2022 **Vélez, Thelma.** 2022 National Organic Research Agenda: Challenges and Findings of Organic Growers across North America. Ohio Ecological Food and Farm Association. Remote, Ohio.
- 2020 **Vélez, Thelma.** Agroecological Mobilization in Puerto Rico: the Intersection of Research, Scholar Activism, and Identity. University of South Dakota. Virtual Zoom.
- 2020 **Vélez, Thelma.** Moderator. Racial Reckoning in the Environment and Food System. Center for Ethics and Human Values. Virtual Zoom.
- 2019 Penn-Nabrit, Paula, Nabrit, Charles, and **Thelma Vélez.** Workshop Organizer and Facilitator. Cross-Pollination Isn't Just for Plants: Diversity and Inclusion in Organic Food Systems. Ohio Ecological Food and Farm Association Conference. Dayton, OH.
- 2018 **Vélez, Thelma.** Moderator. Office of Diversity and Inclusion Undergraduate and Graduate Student Recruitment Initiative. Columbus, OH.
- 2018 **Vélez, Thelma.** Delegate for the Ohio Working Group. National Food Systems Resilience and Equity Workshop. Stanford University, CA.

TEACHING ENGAGEMENTS

Adjunct Faculty/Instructor of Record

Florida International University

EVR 1001 Environmental Science and Sustainability - science course covering: natural resources, ecosystem services, climate change, degradation, biodiversity loss, energy, air and water pollution, and solid waste management. *Fulfills physical science requirement for non-science majors.*

EVR 1017 Global Environment and Society - interdisciplinary course on ecological problems and solution in local and global context using active learning strategies, experiential engagement, and service-learning projects.

Teaching Assistant

Florida International University

EVR 4272 Agroecology - Facilitated and supervised field research projects for undergraduate and graduate students, created weekly inquiry- based assignments, and student-led discussions.

EVR 4274 Sustainable Agriculture - Supervised adaptive-management field projects. Student progress based on innovation, demonstration of critical thinking skills, and engagement.

The Ohio State University

ENR 3500 Community, Environment, and Development - course on sustainable development exploring place-based approaches to environmental justice issues and conflict through role play.

RURL SOC 5540 Population, Place, and Environment course on demographic issues and related environmental issues, GIS, population change and migration in the context of disaster and resource based development.

Guest Lecturer

The Ohio State University

ENR 2300 Society and Natural Resources
Topic: Mobilization for the Environment

COMM 2596 Science Communication
Topic: Communicating Climate Change

SPAN 2422 Intro to Latino Studies
Topic: Contesting Colonialism: Puerto Rico and the Caribbean

Florida International University

BSC 5935 Advanced Plant Conservation Biology
Topic: Local Flora and Invasive Species Management at the FIU Nature Preserve.

EVR 1017 Global Environment and Society
Topic: Natural Resource Management and Global Food Production