Research and Extension Experiences for Undergraduates

UMass Extension Fruit Team Educator Elizabeth Garofalo and Stockbridge School of Agriculture Extension Professor Dr. Jaime Piñero have been awarded a five year $708,000 USDA NIFA AFRI grant in the Education and Workforce Development program. The project is titled: "Engaging Undergraduates in Research and Extension Training using Technology and Experiential Learning to Enhance the Sustainability of Food Production Systems".
This five-year project proposes to increase access to University educational, Extension, and research resources to students from historically underrepresented groups both at UMass and other institutions of higher education and facilitating the sharing of these student's experience with local High Schools focusing on historically underrepresented communities. By creating focused agricultural research, Extension and education modules that take place in labs, on campus, and at University farm facilities, this project aims to provide training for successful academic and professional futures of participating students. We will engage eight undergraduate student interns each year and we will engage local high school students through collaborative educational experiences.

Interns participating in this program will experience a series of Extension, research and educational modules focusing on-
Healthy soil: a living ecosystem and foundation of sustainable Agriculture. This module will be led by Stockbridge School's Dr. Ashley Keiser will expose student interns to soil health issues including sustainable and conventional soil management techniques and chemical and biological processes relevant for soil health.
Applied research: sustainable fruit production and ecologically-based pest management as model systems. This module will be led by Stockbridge School of Agriculture Extension Professor Dr. Jaime Piñero and Stockbridge School of Agriculture's Assistant Director and Professor of Plant Pathology Dr. Dan Cooley and Extension Educator Elizabeth Garofalo. The UMass Cold Spring Research and Education Orchard will host student interns while they learn and explore IPM concepts via execution of field research aimed at managing key insect pests using natural enemies of pests. Student interns will learn that IPM implementation can reduce farm inputs while balancing ecological, social, and economic aspects of farming to move toward sustainability.
Plant disease diagnostic training. This module will be led by Dr. Angela Madeiras from Extension's Plant Diagnostic lab. In this module student in terns will learn plant disease diagnostic techniques, including proper microscope use, fungal morphology, plant sample collection techniques and lab safety and procedures.
Sustainable cold-hardy viticulture. In this module, led by Stockbridge School of Agriculture's Dr. Elsa Petit, student interns will learn to conduct research on the unexplored physiology in response to canopy management of multiple cold hardy grape varieties of emerging interest and the close relationship between domestic grape cultivars and their native wild counterparts.
Orchard watch. This module led by Dr. Dan Cooley and Elizabeth Garofalo will introduce students to the use of cutting-edge technology and its application in agricultural IPM. Student in

terns will collect and analyze large sets of climatic data to increase understanding of weather-based crop production challenges and how to effectively disseminate the results to fruit growers and the public.

Carbon Farming and Agroforestry. In this module, led by SSA Instructor Lisa Dipiano, student interns will understand the basic concepts and science behind carbon farming as well as become familiar with the different applications of the techniques including agroforestry silvopasture.

Professional student development. This module, led by CAFE's Assistant Director for Program Development, Assessment and Federal Compliance Dr. William Miller, will provide student in terns the opportunity to learn critical communication skills and strategies. These skills will allow student interns to effectively communicate to stake holders, policy makers and potential employers.

Extension real-world experience. In this module led by Drs. Jaime Piñero and William Miller and Elizabeth Garofalo, student interns will learn about the history, mission and structure of the Land-grant university system and the diverse portfolio of Extension programs at federal, state and local levels. The goal is to raise student awareness and appreciation for the national system and programs to which they are connected and the roles those systems play in advancing agricultural and related sciences and transferring the knowledge, technology and resources that are generated directly to growers and other end-users.

Educational student engagement experience. This module is led by Elizabeth Garofalo, Dr. Jaime Piñero, Dr. William Miller and supported by the Extension 4-H STEM Ambassador's program. This module will serve as the culminating experience for the proposed internship program. Prior activities and learning experience students have participated in will provide the foundation for a series of community outreach and engagement events. Students will collaborate to design events, then travel to local high schools and community colleges to conduct presentations for students from historically underrepresented groups.

Our driving motivation behind seeking this grant is to create representation in agricultural, educational, and academic arena's for historically underrepresented students with the hope of inspiring interest in fostering passion for these systems that nourish all of our local communities.

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