



# PENNSYLVANIA VEGETABLE MARKETING & RESEARCH PROGRAM

2301 N. Cameron St., Harrisburg, PA 17110 | 717-694-3596 | pvmrp@embarqmail.com | PAVeggies.org

## *Pennsylvania Vegetable Final Research Grant Proposals Funded for 2023*

The Pennsylvania Vegetable Marketing and Research Program Board in cooperation with the Pennsylvania Vegetable Growers Association received the following final research proposals for the Board's consideration at their meeting. The PA Vegetable Marketing and Research Program Board will meet on Wednesday, February 1, at 6:00 p.m. in the Wild Rose Room of the Hershey Lodge, 325 University Drive, Hershey, Pennsylvania, to review these proposals.

Please review these proposals prior to the meeting. You may want to rate them according to the following system:

A - very interested in funding

B - potentially interested in funding depending on available funds and discussion at the meeting

C - very little or no interest in funding

### **1. Evaluation of rapid on-farm monitoring tools for the in-season and site-specific management of the fertigation in high tunnel vegetable production systems**

Francesco Di Gioia - The Pennsylvania State University and Leah Fronk, Karly Ragan, Glen Bupp, Thomas Ford - Penn State Extension

**\$9,997**

- to test the efficacy of buffer solutions that can correct the pH of the soil water extract and limit interferences of the NO<sub>3</sub>-N ion-selective electrode readings. To this purpose soil samples will be collected by Extension Educators from different commercial farms characterized by different soil types. This will allow to validate and transfer the method to Extension Educators and growers.

### **2. Potential Residual Herbicide Programs in Pumpkin**

Dwight Lingenfelter and John Wallace - Penn State and Lynn Sosnoskie, Cornell University

**\$1,500**

-to examine various pre and post herbicide programs in pumpkin (i.e., novel concepts vs. standards) to determine their effectiveness on weed control and to evaluate these herbicide programs on pumpkin injury and yield impact.

### **3. Evaluation of Fungicide Programs for Powdery Mildew Control in Pumpkins**

Timothy Elkner - Penn State Extension and Beth Gugino - Penn State University

**\$6,850**

-To evaluate select fungicide programs for season-long powdery mildew compared to a standard commercial program as well as alternative programs that are developed based on cost. In addition, we will incorporate biorational materials such as Theia, Serifel, Aviv, etc where possible with the overall priority of maintaining yields, fruit quality and needed fungicide resistance management protocols.

-develop and evaluate at least one organic powdery mildew management program using OMRI approved fungicides.

-Develop a breakdown of fungicide program costs for the season.

4. **Evaluation of Pyridate as an Alternative to Atrazine to Enhance Postemergence Weed Control in Sweet Corn when tank-mixed with HPPD-inhibiting Herbicides**  
Lynn Sosnoskie, Cornell University  
**\$1,928**
- Describe the weed control efficacy of an atrazine alternative (pyridate, Tough EC) applied in combination with key HPPD-inhibiting herbicides.
  - Compare the performance of atrazine and atrazine alternatives applied in combination with key HPPD-inhibiting herbicides.
  - Determine if reduced rates of atrazine and atrazine alternatives applied in combination with key HPPD-inhibiting herbicides can produce similar levels of weed control responses across diverse weed communities and environments (Rock Springs, PA, Geneva, NY, Georgetown, DE)
5. **Keeping PA Vegetable Growers Profitable: Statewide Cultivar Trials on Tomatoes**  
Elsa Sánchez – Penn State University and Robert Pollock, Timothy Elkner, Thomas Butzler, and Megan Chawner – Penn State Extension  
**\$20,000**
- to evaluate early maturing, determinate, large, red, slicing tomatoes in 2023. Up to 12 cultivars and selections of early maturing, determinate, large, red, slicing tomatoes will be evaluated in a conventional plasticulture system.
6. **Breeding fresh-market tomatoes for production in PA**  
Majid R. Foolad - The Pennsylvania State University  
**\$8,000**
- to evaluate 87 FM large-size F<sub>1</sub> hybrids with EB resistance.
  - to evaluate 106 FM large size F<sub>1</sub> hybrids with EB + LB resistance.
  - to evaluate 325 PSU-JSS FM large size F<sub>1</sub> co-hybrids with EB +LB resistance.
  - to evaluate 27 FM plum tomato hybrids with EB and/or EB + FB resistance.
  - to evaluate 93 FM grape tomato hybrids with EB and/or EB + FB resistance.
  - further evaluation of elite inbred lines of FM plum tomatoes.
  - continuation of a project to identify and map genes for bacterial canker resistance to be used for breeding purposes.
7. **Breeding processing tomatoes for production in PA**  
Majid R. Foolad - The Pennsylvania State University  
**\$8,000**
- to evaluate a total of 54 PROC tomato F<sub>1</sub> hybrids with EB resistance.
  - to evaluate 62 PROC tomato F<sub>1</sub> hybrids with EB + LB resistance.
  - commercial trialing of PSU PROC tomato F<sub>1</sub> hybrids by tomato processing/canning companies.
  - development and evaluation of new inbred lines of PROC tomato with EB resistance.
  - identification of new sources of genetic resistance to tomato bacterial canker and genetic mapping of resistance genes.

**Total approved funding for 2023: \$56,275**

**The following proposals were not funded for 2023:**

**1. Precision cultivation using camera guidance technology in snap bean**

John Wallace and Tosh Mazzone, Penn State University and Lynn Sosnoskie, Cornell University

**\$1,600**

- Understanding the tradeoff between weed control and crop tolerance is a significant knowledge gap that prevents use of row crop cultivation in horticultural crops.
- to establish a field research trial that will evaluate cultivation timing of in-row cultivation with finger-weeders and camera-based guidance to enhance weed control and minimize crop injury, therefore preserving yields. Preliminary results suggest that there may be targeted timings that improve yields and maintain weed control objectives.

**2. Optimization of Hydroponic Lettuce Nutrition in Nutrient Flow Technique and Deep Water Culture Systems**

Krystal Snyder and Elsa Sanchez, Penn State University and Carla Garzon, Delaware Valley University

**\$6,678**

We will trial six different fertilizer programs for hydroponic lettuce. This is a two-fold experiment in which we will use NFT systems and reduce the macronutrients nitrogen, phosphorus, and potassium, and increase the micronutrients iron, manganese, zinc, boron, copper and molybdenum. In this experiment, calcium, magnesium and sulfur will remain constant using Sonneveld's levels. The second experiment will be in deep water culture systems, where the overall amount of fertilizer per plant will stay constant but the amount of water per plant will increase. By funding this project, the potential to put fresh food on the tables of Pennsylvanians increases while putting more money in growers' pockets and benefiting the environment.

**3. Study the impacts of soil aggregate stability on crop nutrient uptake and differences between cropping systems and management practices for growing vegetables**

Dr. Gladis Zinati - Rodale Institute

**\$7,580**

- to assess wet soil aggregate stability in soil samples taken in 48 plots of VST at the 0-4 inch depth, and 4-8-inch depth.
- to assess mineral nutrient concentration in harvested crops from 48 plots.
- to disseminate the results to growers using various educational venues such as but are not limited to, an on-farm annual field day, a web article posted on Rodale Institute's website, an article in a PVGA newsletter, and an online seminar in 2023 or early 2024.

**4. Evaluation of rootstock-scion interaction and yield performance in fresh-market tomato grown in high-tunnel**

Timothy Elkner – Penn State Extension and and Francesco Di Gioia – The Pennsylvania State University

**\$9,889**

- to evaluate the performance of two fresh-market tomato varieties grafted onto four commercial rootstocks examining the rootstock-scion interaction effect on plant growth, nutrient uptake, yield, and fruit quality in a high tunnel under PA environmental conditions.