

**PENNSYLVANIA VEGETABLE MARKETING AND RESEARCH PROGRAM  
PENNSYLVANIA VEGETABLE GROWERS ASSOCIATION  
2017 RESEARCH REPORT**

**Addressing Issues with High Soluble Salt Levels in High Tunnels**

Elsa Sánchez, Professor of Horticultural Systems Management

Tom Ford, Senior Extension Educator, Horticulture

Pennsylvania State University Department of Plant Science and Extension

We have been working to determine the extent that high salt levels in high tunnels are a problem, offering solutions to manage the problem, and developing resources for avoiding the problem. We proposed to analyze soil and irrigation water from 50 organic and conventional high tunnels throughout Pennsylvania. To date, we have contacted 55 high tunnel farmers throughout Pennsylvania to see if they would like to be involved in our project. Thus far, 25 farmers from 17 counties across Pennsylvania have agreed to participate. Participants have been conventional to organic and represented many groups including women and men and Anabaptist and English farmers of varying age groups. Participants have completed a brief survey on their high tunnel practices. Then, they received prepaid soil testing kits including organic matter and soluble salts analysis and irrigation water testing kits. Additionally, return postage was provided for all soil and irrigation water kits. By individual, testing and postage has amounted to about \$100. We had intended to visit 15 farms for on-site discussion and analysis of high tunnel soil and irrigation water quality; however, we forgot to include postage in our original budget. Therefore, we decided to forgo this portion of the proposal in order to maximize the amount of farmers who could participate in the project.

Soil and irrigation water has been analyzed by Penn State's Agricultural Analytical Services Laboratory. Once we receive reports and surveys, we have written letters to each participant with an interpretation and recommendations specific to their farm. Each letter has been 2 or 3 pages long and has also included enclosures. The most common issues have been high soluble salt levels and phosphate, potash, calcium, and/or magnesium levels exceeding crop needs. We have provided recommendations for reclaiming saline soils as well as for preventing increasing soluble salt levels. We have also offered recommendations for decreasing above optimal nutrient levels as well as for supplying nitrogen to high tunnel crops. The most frequent problems with irrigation water quality have been with high pH, alkalinity, and/or hardness. We have provided recommendations for acidifying water and for remedying issues with plant growth in surface water.

Through this project we have learned a lot about high tunnel soils and irrigation water quality. To further extend this information, we are going to be presenting results and recommendations from this project at the 2018 Mid-Atlantic Fruit and Vegetable Convention and Farming for the Future Convention. During these presentations we will solicit more participants in an effort to reach the 50 we proposed. We also plan on sending a final report to all the participants with a summary of everyone's results. We will also develop articles on managing high tunnels soils and irrigation water to post on the Penn State Extension website.