

Annual Report for Smith-Lever Funded Projects

Project Title: Improved NEWA Vegetable Models
Principal Investigator: Abby J. Seaman
Project Start: 10/1/2013 **Project Term:** 9/30/2016
Report Fiscal Year: 2016

Plan of Work Area(s): General Production Practices
Agricultural Environmental Management

Executive Summary: Weather based pest forecast models are important tools for IPM implementation. The Network for Environmental and Weather Applications (NEWA) (<http://newa.cornell.edu>) provides forecasts for important pests of fruits and vegetables. A 2007 survey (Carroll et al.) of farmers using NEWA showed that use of pest forecasts saved an average \$19,500 in spray costs and prevented an average of \$264,000 in crop losses each year. The survey also found that vegetable growers comprised only 30% of users, a level we hope to increase through this project. We updated the NEWA vegetable models to improve the user interface and incorporate forecast weather.

Progress Summary: Over the course of this project we updated all vegetable models on NEWA to improve the use interface and incorporate forecast weather. Forecast results for multiple disease models for a given crop are now displayed together so all can easily be taken into account when making treatment decisions. We also updated the user support documents to reflect these changes. We compared onion disease model output with scouting data and found that one model was not adequately forecasting disease so it was removed.

Updated models:

[Potato disease models](#)

[Tomato disease models](#)

[Onion disease models](#)

[Cabbage maggot model](#)

[Onion maggot model](#)

One ongoing aspect of the project is implementing degree-day models for emergence of eight annual weed species. We collected soil temperature data to help validate a soil temperature model currently on NEWA that

will be used in the degree-day forecasts. They will be made available for researchers to use validating the models in the field.

Expected and Observed Impact/Outcome:

Expected impacts include increased use of vegetable forecast models and improved user experience with the new interfaces. This will result in improved pest management outcomes for users through better timing of pesticide applications while maintaining crop quality, and may decrease pesticide use, especially for disease pests in drier years.

Evaluation Approaches/Methods and Results:

We had intended to evaluate the project by comparing model before and after updates, but discovered that it is not possible to track use of individual models so have not had a method for evaluating changes in useage.

Diverse Audiences Reached:

The models are available online and are accessible by any audiences, but we are not able to track audience diversity.

Multi-State Activities:

Publication(s):

Communication(s):

All updated models are available on the NEWA web site: newa.cornell.edu

Presentation(s):

1/16/14: NEWA resources for vegetable growers. Long Island Ag Forum, Riverhead, NY. 30 minutes, Invited speaker, grower audience, 78 attendees.

1/26/14: Late blight forecasting. NOFA-NY Winter Conference, Saratoga Springs, NY. 15 minutes, invited speaker, grower audience, 100 attendees.

3/20/14: Late blight forecasts on NEWA and what's available on usablight.org. Late blight Decision Support System training, Rochester, NY. 15 minutes Co-organizer and speaker, grower and consultant audience, 8 attendees.

10/21/14: Late blight forecasting. NOFA-NY Disease Management Workshop, Geneva, NY. 30 minutes, invited speaker, grower audience, 35 attendees.

3/20/15: Late blight forecasts on NEWA and what's available on usablight.org. Late blight Decision Support System training, Rochester, NY. 15 minutes Co-organizer and speaker, grower and consultant audience, 10 attendees.

1/20/16: Staying on top of the weather: Tomato disease forecasts on NEWA. Empire State Producer's Expo. Invited speaker, grower, extension, and consultant audience. 115

attendees.

Project Conclusion:

We updated all vegetable models on NEWA to improve the user interface, incorporate forecast weather data, and merged multiple disease models for individual crops to make it easier to take all into account when making a treatment decision. Unfortunately, our planned evaluation approach of tracking model use before and after revision was not possible because those statistics are not tracked by individual model. We introduced the revised models to potential users at conferences and workshops. These revisions make the models more valuable through the incorporation of forecast weather data and the new user interfaces make easier to use them.