

# **NYWGF RESEARCH - FINAL REPORT TEMPLATE**

Please fill in by **typing over the red** directions in each section and change font to black.

**Funding for fiscal year:** 2023

## **SECTION 1:**

**Project title:** Increasing the Reliability and Scope of NEWA Weather and Pest Model Information

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**New Research**  **Continued Research**  (**CHECK APPROPRIATE BOX**)

**Amount Funded** \$ 54,996.00

## **SECTION 2:** (This section should be in depth and akin to an academic report)

**Project Summary Impact Statement:** NEWA, <http://newa.cornell.edu>, gives end users free access to 40 IPM, crop management, and degree day tools driven by weather data from weather stations primarily located on farms. In a 2007 survey, apple, grape, onion and potato growers in NY using NEWA reported that they can save, on average, \$19,500 per year in spray costs and prevent, on average, \$264,000 per year in crop loss as a direct result of using NEWA pest forecast tools. This tool is essential to the success of our grower stakeholders. There is a critical need for a technician's time to be devoted to installing, monitoring and maintaining the weather network to keep a robust stream of data flowing to NEWA to ensure that the pest model information is reliable. A number of the disruptions in the stream of weather data can be diagnosed and corrected by a simple phone call, while others require a visit to the station to correct the problem.

### **Objectives: Objectives:**

1. Increase reliability of weather and pest model information provided through the NEWA website through monitoring and machine maintenance in the Lake Erie and Finger Lakes Regions.
2. Increase adoption of the phenology-based degree-day model for timing of management strategies for grape berry moth, powdery mildew, downy mildew, black rot and Phomopsis.

### **Justification of Research:**

Grape growers face the risk each season of their vineyards being attacked by insects and

diseases whose severity is dependent on the current season's weather conditions. This results in growers needing to modify their vineyard IPM strategy on a yearly, monthly and, sometimes, daily basis. Research-based IPM practices have been developed and modeled for grape pests on the Network for Environment and Weather Applications (NEWA) website. The Lake Erie Mesonet was expanded from 4 to 12 weather instruments in the Lake Erie region in 2011/2012 and from 12 to 22 in 2018. The Finger Lakes Grape Region also has a number of aging machines that are unreliable. This has resulted in a critical need for a portion of a technician's time to be devoted to installing, monitoring and maintaining the weather network to keep a robust stream of data flowing to NEWA to ensure that the pest model information is reliable. A number of the disruptions in the stream of weather data can be diagnosed and corrected by a simple phone call, while others require a visit to the station to correct the problem. Increased weather and pest model information provides the opportunity for expanded grower education, training and practical exposure to the resources available on the NEWA website. By increasing the size of the effective area being covered, as well as the reliability of the weather and pest model data, adoption of cost-effective, research-based IPM practices will be increased through eNEWA alerts and grower education on the resources available through NEWA.

### **Materials & Methods:**

**Objective 1. Increase reliability of weather and pest model information provided through the NEWA website through monitoring and machine maintenance.** Daily monitoring during the work week of the NEWA sites associated with grape growing in the Lake Erie and Finger Lakes grape regions will be conducted to ensure that any problems with collection or dissemination of weather and grape pest model information is dealt with in a timely and efficient manner, keeping downtime at a minimum. When a problem does arise the technician will troubleshoot the problem with the grower over the phone (many communication issues can be easily fixed this way) and if this does not fix the problem, a site visit will be set up in an attempt to fix the problem. For issues that cannot be dealt with in the field, the technician will work with Kestrel/Rainwise to get the unit in for repair.

**Objective 2. Increase adoption of the phenology-based degree-day model for timing of management strategies for grape berry moth, powdery mildew, downy mildew, black rot and Phomopsis.** Growers across New York State and Erie County Pennsylvania will be provided the opportunity to receive eNEWA for grapes. The eNEWA –grapes alert was developed in conjunction with a programmer at the Northeast Regional Climate Center to provide grape growers a daily email with model results including two days prior, and forecasted five days in advance for grape berry moth, powdery mildew, black rot and Phomopsis. In addition to the daily eNEWA alerts, small group training sessions (in person or via Zoom videoconferencing) will be held throughout the growing season to familiarize them with accessing information on NEWA and to provide an opportunity for a more in-depth understanding of how the information can be used to make decisions in their vineyards.

Growers will be asked to complete a survey to develop a baseline of current practices (NEWA models, calendar sprays, etc.) used to manage vineyard pests. This information will be used to develop the appropriate extension programming to provide growers the tools they need to effectively manage their vineyard pests. Correlations between the insect and disease model outputs found on NEWA, with actual management strategies used, will be accomplished through grower spray records. Survey information will allow us to develop a cost/benefit analysis of using the information found on NEWA to manage vineyard pests.

Combining spray records with the Grape Berry Moth model information found on NEWA will provide insight into causes of late season grape berry moth damage.

**Objective 3. Increase effective area of NEWA weather and pest model information through expansion of the Kestrel(Rainwise)/Onset weather instrument network in the Lake Erie and Finger Lakes regions.** This objective is to increase effective area with the installation of Kestrel(Rainwise)/Onset weather instruments purchased from this grant to expand and upgrade the NEWA network in our Lake Erie and Finger Lakes regions.

**Results/Outcomes/Next Steps:** Growers will become better able to adjust their vineyard IPM strategy against damage from primary diseases and grape berry moth using the weather and pest model information found on NEWA. This will lead to increased profitability by limiting crop loss from insect and disease pests. By concentrating on late season grape berry moth damage, growers will increase the quality and quantity of grapes delivered to processors leading to increased profitability. Temperature data also aids in management practices decisions for cold hardiness and water availability.

**Objective 1 Results:**

- All stations monitored on a regular basis
- Problems corrected before major disruption in the weather data occurred
- Work increased the reliability of the data used by NEWA to develop the weather and pest models used by grape growers and generated collaboration with researchers to investigate reliability of pest models
- Joined regional NEWA network meetings to share information, make connections to better service our region, and direct connection to station providers
- Replaced two aging stations and added two new stations to increase coverage and reliability in the Lake Erie Grape Region 26 total stations
- Four stations in Finger Lakes Region replaced or added coverage to bring reliable weather data and pest models
- Technician made 37 site visits, 110 emails, 18 phone calls, and 7 in-person contacts in Lake Erie and Finger Lakes Region
- Monitored NEWA help desk to address region questions

**Objective 2 Results:**

- Implementation of NEWA resources in a vineyard IPM strategy was a focus of programming
- 16 in-person grower meetings and 2 virtual meetings with over 900 attendees
- 13 crop updates; 2 newsletter articles, numerous podcasts, and face-to-face discussions with growers on using the NEWA platform
- Through educational outreach and grower interactions, concerns of the performance of the GBM model were presented
- Prompted discussions with Cornell and Penn State University researchers about future research to look into GBM resistance, possible differences in egg-laying habits, and the performance GBM model on NEWA and continues
- Encouraged collaboration across organizations

**Objective 3. Increase effective area of NEWA weather and pest model information**

**through expansion of the Kestrel(Rainwise)/Onset weather instrument network in the Lake Erie and Finger Lakes regions.** This objective is to increase effective area with the installation of Kestrel(Rainwise)/Onset weather instruments purchased from this grant to expand and upgrade the NEWA network in our Lake Erie and Finger Lakes regions.

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- Four stations in Finger Lakes Region replaced or added coverage to bring reliable weather data and pest models

#### **Technology Transfer Plan:**

Information will be provided to growers through on-site visits, small group meetings, Zoom videoconference events, newsletter articles, daily eNEWA emails, the NEWA website ([newa.cornell.edu](http://newa.cornell.edu)) and the NEWA blog (<http://blogs.cornell.edu/yourenewa>).

- 16 in-person grower meetings and 2 virtual meetings with over 900 attendees
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**Attachments:** relevant charts and graphs, photos etc.

**SECTION 3:** (The goal of this research is to benefit growers and producers across New York State. Result summaries will be shared on the NYWGF website and via email newsletters. To that end, this section should be brief and written in terms understandable for the average grower and producer, as well as consumers and trade interested in our industry.)

- 16 in-person grower meetings and 2 virtual meetings with over 900 attendees
- 13 crop updates; 2 newsletter articles, numerous podcasts, and face-to-face discussions with growers on using the NEWA platform

**Project summary and objectives:** NEWA, <http://newa.cornell.edu>, gives end users free access to 40 IPM, crop management, and degree day tools driven by weather data from weather stations primarily located on farms. In a 2007 survey, apple, grape, onion and potato growers in NY using NEWA reported that they can save, on average, \$19,500 per year in spray costs and prevent, on average, \$264,000 per year in crop loss as a direct result of using NEWA pest forecast tools. This work is essential to the success of our grower stakeholders for installing, monitoring and maintaining the weather network to keep a robust stream of data flowing to NEWA to ensure that the pest model information is reliable. A number of the disruptions in the stream of weather data were diagnosed and corrected, increased adoption of the phenology-based degree-day model for timing of management strategies for grape berry moth, powdery mildew, downy mildew, black rot and Phomopsis occurred through on-site visits, small group meetings, Zoom videoconference events, newsletter articles, emails, phone calls, site visits, the NEWA website ([newa.cornell.edu](http://newa.cornell.edu)) and the NEWA blog (<http://blogs.cornell.edu/yourenewa>). We also increased and enhanced the range of reliable weather stations in the Finger Lakes and Lake Erie Grape Regions.

(5 Sentence Max)

**Importance of research to the NY wine industry:** Growers will become better able to adjust their vineyard IPM strategy against damage from primary diseases and grape berry moth using the weather and pest model information found on NEWA. This will lead to increased profitability by limiting crop loss from insect and disease pests. By concentrating on late season grape berry moth damage, growers will increase the quality and quantity of grapes delivered to processors leading to increased profitability. Temperature data also aids in management practices decisions for cold hardiness and water availability.  
(5 Sentence Max)

**Project Results/next steps:** With the funding from the NYWGF, we were successful at meeting our objectives and creating new research questions working with Dr. Greg Loeb to ensure that the pest models are reliable. We also were able to keep a continuous and reliable stream of data available for the growers who rely on this technology to make management decisions in their vineyards. We were able to add new coverage in both the Finger Lakes and Lake Erie Grape Growing Regions and enhance the existing coverage to support grape growers facing the risk each season of their vineyards being attacked by insects and diseases whose severity is dependent on the current season's weather conditions. We will continue to monitor and hopefully increase the coverage area in the upcoming year, as well as, work with researchers to further the reliability of our pest models.

**Supporting attachments:** (Choose a maximum of 1 supporting figure or table to demonstrate results if desired)