NYWGF RESEARCH - FINAL REPORT

Funding for fiscal year: April 1, 2024 – March 31, 2025

SECTION 1:

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

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New Research ☐ **Continued Research** ☒

Amount Funded **$** $47.022

SECTION 2:

Project Summary Impact Statement:

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. A 2007 survey found that NEWA users in NY 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 IPM forecast tools. 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. We went from 22 to 26 in 2023, but we decommissioned the Portland Escarpment station due to the sale of the farm. The Finger Lakes Grape Region also has a number of aging machines that are unreliable. In 2023 we increased the network by one new station in Williamson (Young Somer) and replaced three aging stations. 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 grower education on the resources available through NEWA.

Objectives:

Objective 1. Increase reliability of weather and pest model information provided through the NEWA website through monitoring and machine maintenance.

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, Phomopsis, and cold hardiness prediction.

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.

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 collaborate 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, Phomopsis, and cold hardiness prediction. Growers across New York State and Erie County Pennsylvania will be provided the opportunity to receive education on NEWA resources for grapes. Text blast notifications will be sent to subscribers for extreme weather events through the monitoring of the data by the NEWA technician. In addition to the text alerts, small group training sessions (in person or via Zoom video conferencing) 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 surveyed in group meetings 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 with 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 meetings. Survey information will allow us to develop a cost/benefit analysis of using the information found on NEWA to manage vineyard pests. Combining spray management strategies with the Grape Berry Moth model information found on NEWA will provide insight into causes of late season grape berry moth damage. This year we will also provide education on the expected integration of Cornell's Cold Hardiness Prediction model into the NEWA network as appropriate.

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 areas 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:

Technology Transfer Plan:
Information will be provided to growers through on-site visits, small group meetings, Zoom videoconference events, newsletter articles, text blast notifications, the NEWA website (newa.cornell.edu) and the NEWA blog (http://blogs.cornell.edu/yourenewa).

Attachments: relevant charts and graphs, photos etc.

SECTION 3: 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 insects 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.

Project summary and objectives: 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. 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 grower education on the resources available through NEWA.

Importance of research to the NY wine industry: 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. 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 grower education on the resources available through NEWA.

Project Results/next steps:
Objective 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 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 and continued to nurture those relationships

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 Results:

- Implementation of NEWA resources in a vineyard IPM strategy was a focus of programming at 13 in-person grower meetings with over 730 attendees
- 22 crop updates; 2 newsletter articles, 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 researched and discussed 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
- Spotted Lanternfly model was discussed and Kim Knappenberger encouraged collaboration across organizations involved with NEWA
- With EPA ESA regulation and label changes, weather station information may be required to be in compliance with the law.

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.

- Added two new stations to increase coverage and reliability in the Lake Erie Grape Region 35 total stations
- Brought FLX total to 5 new stations with 4 operational. Cellular station replaced a struggling WIFI station in Finger Lakes Region. That WIFI station to be relocated.
- Technician made 58 site visits, 123 emails, 23 phone calls, 22 Crop Updates, and 2 Newsletters in Lake Erie and Finger Lakes Region
- Monitored NEWA help desk to address region questions