Increasing the Reliability and Scope of NEWA Weather and Pest Model Information in the Lake Erie Region

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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.

Results

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

The Lake Erie Mesonet of NEWA consists of twenty-two Rainwise stations, two airports and two NYS Mesonet stations (Burt in Niagara County and Fredonia in Chautauqua County). All stations were monitored on a regular basis and allowed us to correct a problem before a major disruption in the weather data occurred in the majority of instances. This increased the reliability of the data used by NEWA to develop the weather and pest models used by grape growers in the Lake Erie region. The NEWA technician contacted growers to correct problems with the flow of data and in many cases was able to fix the problem with that call. When a simple phone call cannot correct the problem, a support ticket is developed alerting both NEWA and Rainwise of the problem. The NEWA technician then works with this team to find a solution to the problem. As a result of ordering two weather stations late with last year's funds and early with this year's, we were able to replace 4 of our aging weather stations in 2022. Decisions on which stations were to be replaced were made by considering the age of the station in addition to the impact each station has on acreage in a 1-mile radius. Three were replaced with Rainwise AgroMet MKIII weather stations and one with an Onset HOBO station. Aside from a few issues with the HOBO station sensors, all have been collecting data much more reliably. Problems ranged from communication issues (requiring a reset of the IP-100 or in one instance moving the station to get a line of sight to the IP-100) to malfunctioning tipping rain gauges or temperature and relative humidity sensors that needed adjustment or replaced. One location has been battling ant infestations that corrupt the motherboard. There were 35 site visits were required during 2022 to correct a problem. 115 emails, 12 phone calls, and 6 in-person contacts.

Through the year there have been the usual connection and maintenance issues that spring up from time to time, and those have been dealt with in a timely manner.

In addition to monitoring the Lake Erie Mesonet, the technician had the added responsibility of monitoring the stations in the Finger Lakes Mesonet. This is basically just ensuring that the stations are reporting to NEWA. An email is sent daily that indicates the functionality of each station. Calls and emails were sent to owners of those stations to troubleshoot. One site visit was made. At the end of the year there are six stations that have become inactive or that are experiencing problems due to the age of those stations.

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.

The implementation of NEWA resources in a vineyard IPM strategy was a focus of programming during the pest management portion of 16 in-person grower meetings and 4 virtual meetings during the 2022 growing season with over 935 attendees. In addition, there were 13 crop updates; 2 newsletter articles, numerous podcasts, and face-to-face discussions with growers on using the NEWA platform were held.

Over nine hundred thirty-five industry stakeholders including growers and members of the Lake Erie grape industry participated in discussions ranging from what resources are available on NEWA, to how to implement the information provided by the weather and pest models found on NEWA. NEWA was also a significant subject in the *Crop Update*, LERGP's weekly electronic update to encourage the implementation of disease and GBM model information. A table was published in the *Crop Update* from the beginning of June that provided the output of the grape berry moth model found on NEWA for the 24 stations we are currently monitoring in the Lake Erie region. Readers were encouraged to access the model on NEWA for the station closest to their vineyard to take advantage of the models ability to allow a user to input the wild grape bloom date (biofix date to start the GBM model) to get the most accurate model for their vineyard operation. There were numerous questions on the nearly twenty-year old GBM model from our stakeholders over the growing season. Growers were concerned with the validity of the model with changing climate. Concerns prompted discussions with Cornell University's, Dr. Greg Loeb, and Penn State University's, Flor Acevedo and Bryan Hed, to inquire about future research to look into GBM resistance, possible differences in egg-laying habits, and looking into the GBM model on the NEWA platform.

NEWA Location	Wild grape bloom date*	DD Total on August 23, 2019	Forecasted DD for August 28, 2019
Versailles	June 7	1736	1836
Hanover	June 8	1765	1869
Sheridan	June 6	1844	1951
Silver Creek	June 8	1806	1913
Dunkirk Airport	June 9	1810	1916
Forestville	June 8	1780	1883
East Fredonia	June 9	1741	1848
Fredonia	June 9	1707	1813
Brocton Escarp.	June 9	1729	1836
Portland Escarp.	June 7	1793	1897
Portland	June 8	1787	1892
East Westfield	June 9	1734	1842
Westfield	June 9	1757	1865
Ripley	June 8	1831	1923
Ripley Escarp	June 8	1755	1862
Ripley State Line	June 8	1802	1909
North East State Line	June 9	1723	1818
North East Escarp	June 7	1788	1889
North East Sidehill	June 8	1760	1861
North East Lab	June 8	1847	1962
Harborcreek	June 8	1796	1909
Harborcreek Escarp	June 9	1693	1800
Lake City	June 7	1843	1951
Ransomville	June 11	1755	1865
Burt	June 19	1555	1665
Corwin	June 13	1680	1787
*** Estimated date provided by NEWA website**			

Table 1. Example of table showing results of the Grape Berry Model on NEWA created for use in 2019 *Crop Updates.* This example is from the August 23, 2019 *Crop Update*.

Growers across New York State had the opportunity to receive the eNEWA grape alert, a daily email delivered at the time of their choosing for as many weather instruments as they requested. The daily eNEWA-grape alert provided information on weather and pest model output and is best used to alert growers that they should access the NEWA website to get the most up to date weather or pest model information on potential problems.