Cornell University
New York State
Integrated Pest Management Program

NEWA

# Expansion Documentation
# Network for Environment and Weather Applications (NEWA)
# newa.cornell.edu

Dan Olmstead, NEWA Coordinator
New York State IPM Program, Cornell University, 630 W. North St., Geneva, NY 14456

*NEWA welcomes the addition of Expansion Networks.*

***Introduction to NEWA***

The Network for Environment and Weather Applications (NEWA) delivers weather data from weather stations primarily located on farms through the Internet at newa.cornell.edu and automatically calculates and displays weather data summaries and IPM & crop forecast tool results. NEWA provides weather information and tools for more precise IPM and crop production practices. The current website was launched in November, 2009.

NEWA was formed in 1995 and continues to evolve to stay current with advances in pest and weather forecasting. It is operated by the New York State Integrated Pest Management (NYS IPM) Program and collaborates with the Northeast Regional Climate Center (NRCC), Department of Earth and Atmospheric Sciences, Cornell University. For more information, visit About NEWA at newa.cornell.edu/index.php?page=about-newa.

The weather stations are owned primarily by farmers, Cornell University, land grant University partners, and agricultural industries. RainWise, Inc. and Onset are our partners for hardware and software development for the weather station network, see Purchase a NEWA Weather Station at newa.cornell.edu/index.php?page=purchase-a-station. .

Weather data is collected via Ethernet interface, cellular data, or via mesonet collaborations. Weather data is archived and run through quality control routines prior to calculating and displaying weather summaries, degree day accumulations, and IPM and crop forecast tools.

Degree days (DD) for eleven base temperatures, including growing degree days (GDD), are calculated and displayed. There are over 30 weather-based IPM forecast tools deployed in NEWA. References for the NEWA tools can be viewed at newa.cornell.edu/index.php?page=newa-pest-forecast-model-references. More tools are added as they become available or are developed and validated by faculty at Cornell University and partner land grant institutions.

In addition, NEWA provides a portal to weather and IPM forecast products developed by other groups and researchers (National Oceanic and Atmospheric Administration, NRCC, National Weather Service (NWS), ipmPIPE, the North American Plant Disease Forecast Center, etc.)

***NEWA Expansion***

Extension faculty and growers aware of the benefits of NEWA, want NEWA coverage in their geographic regions. The NRCC and NEWA have agreed on the mechanism for expansion. This document describes,

(1) the services or benefits the NEWA expansion networks will receive, and
(2) the obligations of the NEWA expansion networks,
(3) the requirements for the NEWA expansion networks to receive NEWA coverage.

***(1) Services or Benefits the NEWA Expansion Networks Receive***

- All available airport weather stations in the expansion network's geographic region, at the discretion of the expansion network coordinator, will be included in NEWA. An algorithm adjusts airport relative humidity data to align with agricultural sites.
- Technical support on installing and managing weather stations and networks.
- Technical support on methods for collecting and transmitting weather data.
- Targeted NEWA website development, including required updates, additions, and upgrades (i.e. station location links, maps, reports, biofix dates, tools, extension information, etc. specific to their region).
- Access to all the information on the NEWA website
  - see newa.cornell.edu, includes but is not limited to -
    - crop pages (apples, grapes, onions, potatoes, tomatoes, and sweet corn)
    - National Weather Service information
    - new products, as they become available, that are resources that can be linked to on the NEWA website.
- Access to all the weather data programming within the NEWA website
  - see newa.cornell.edu, includes but is not limited to -
    - station pages for each weather station location.
    - weather data summaries (hourly, daily, DD, etc.)
    - IPM & crop production tools (station-specific from NEWA and regional from NRCC). 14 for apple, 5 for grape, 10 for vegetables, 2 for field crops, and 1 for ornamentals & turf
    - crop management (GDD, DD forecasts, drought, ET models, etc.)
    - new IPM and crop production tools, as they become available, provided either they utilize NEWA or NRCC weather data sources or the NEWA website can link to the new resource.
- A website structure and platform upon which to develop IPM forecast tools and weather-based products of utility to crop production in their regions.

***(2) Obligations of the NEWA Expansion Networks***

The NEWA expansion networks will

- Purchase NEWA-configured weather stations from RainWise, Inc. or Onset (unless the weather stations are in an existing mesonet or the outside network is contracting for additional data-compatibility programming work).
    - see newa.cornell.edu/index.php?page=purchase-a-station. .
- Set up the weather stations so they collect accurate data and transmit the data to the NEWA servers. This includes covering the cost of phone lines, Ethernet connections, computer hardware, etc., as appropriate to collect and transmit the weather data.
    - see http://newa.cornell.edu/index.php?page=placement-guidelines.
- Accept responsibility for the maintenance of the weather stations in their network.
    - see http://newa.cornell.edu/index.php?page=maintenance-guidelines.
- Provide the required metadata (unless the weather stations are in an existing mesonet) for each weather station via the online form blogs.cornell.edu/yourenewa/onboard/
- Allow free access to the weather data, data summaries, IPM forecast tools, station pages, etc., that are generated on newa.cornell.edu from their weather station data.
- Provide input on needed NEWA updates, additions, and upgrades (i.e. links, maps, reports, biofix dates, tools, extension information, etc. specific to their region).
- Assign a "Coordinator" for their network who is the NEWA contact person. The Coordinator is responsible for keeping their instrumentation running in good condition, specifically -
    - receiving and interpreting daily quality control emails from NRCC about the weather stations in their network.
    - reviewing their data routinely on newa.cornell.edu to verify its integrity.
    - receiving "trouble calls" forwarded by NEWA personnel.
    - contacting station owners about repair, maintenance, and data integrity issues.
    - determining the "sister stations" for each weather station in their network (these stations are used to support data quality control and integrity).
    - determining and providing to NEWA the station location name; its latitude, longitude, and elevation; the data delivery type (Ethernet interface, cellular data, or mesonet); and the sister station location name(s).

***(3) Requirements for the NEWA expansion networks to receive NEWA coverage***

The requirements of each NEWA expansion network will be to pay a yearly participation fee, invoiced by the New York State IPM Program, for NEWA coverage and benefits in their region. As of January 2015, the fee is $1750 per year for groups larger than six weather stations and $290 per year for individuals outside of member states (CT, MA, MI, MN, NC, NH, NJ, NY, OH, PA, UT, VA,VT, WI, and WV). Individuals installing more than one weather station will pay a discounted fee of $260 per year for each subsequent weather station(s) installed. The yearly participation fee is billed in January and the invoice is sent to the designated expansion network coordinator or the individual.

The yearly participation fee will cover:

- organizational assistance,
- weather station IT guidance (i.e. installation and data transmission),
- data acquisition from weather stations to the NEWA server,
- set-up and data acquisition to the NRCC database,
- data flow / archiving / quality control,
- missing data issues,
- required web page updates
- nominal web site updates (i.e. region-specific links),
- automated "Daily status emails" to the expansion network coordinator,
- web access, and
- access to the NEWA services and benefits described under (1) above.

***NEWA Expansion Networks participation disclaimer -***

Accuracy of the weather data is the responsibility of the owners of the weather station instruments. NEWA is not responsible for accuracy of the weather data collected by instruments in the network. **The pest forecast tools are theoretical predictions and forecasts.** The theoretical tools predicting pest development, disease risk, or crop development use the weather data collected (or forecasted) from the weather station location. **These results should not be substituted for actual observations** of plant growth stage, pest presence, and disease occurrence determined through field observations, scouting or insect pheromone traps. **In no event shall Cornell University or any weather station be liable to any party for direct, indirect, special, incidental, or consequential damages, including lost profits, arising out of the use of NEWA.**