NEWA berry models – how you can make them work for you

Juliet Carroll, NYS IPM, Cornell University

NEWA is a crowd-sourced, open-access weather network

- Producers share weather data through NEWA
- Weather is tabulated in hourly and daily summaries
- Rain, temperature, humidity, leaf wetness, solar radiation, wind
- These data run 40 agriculture decision support tools

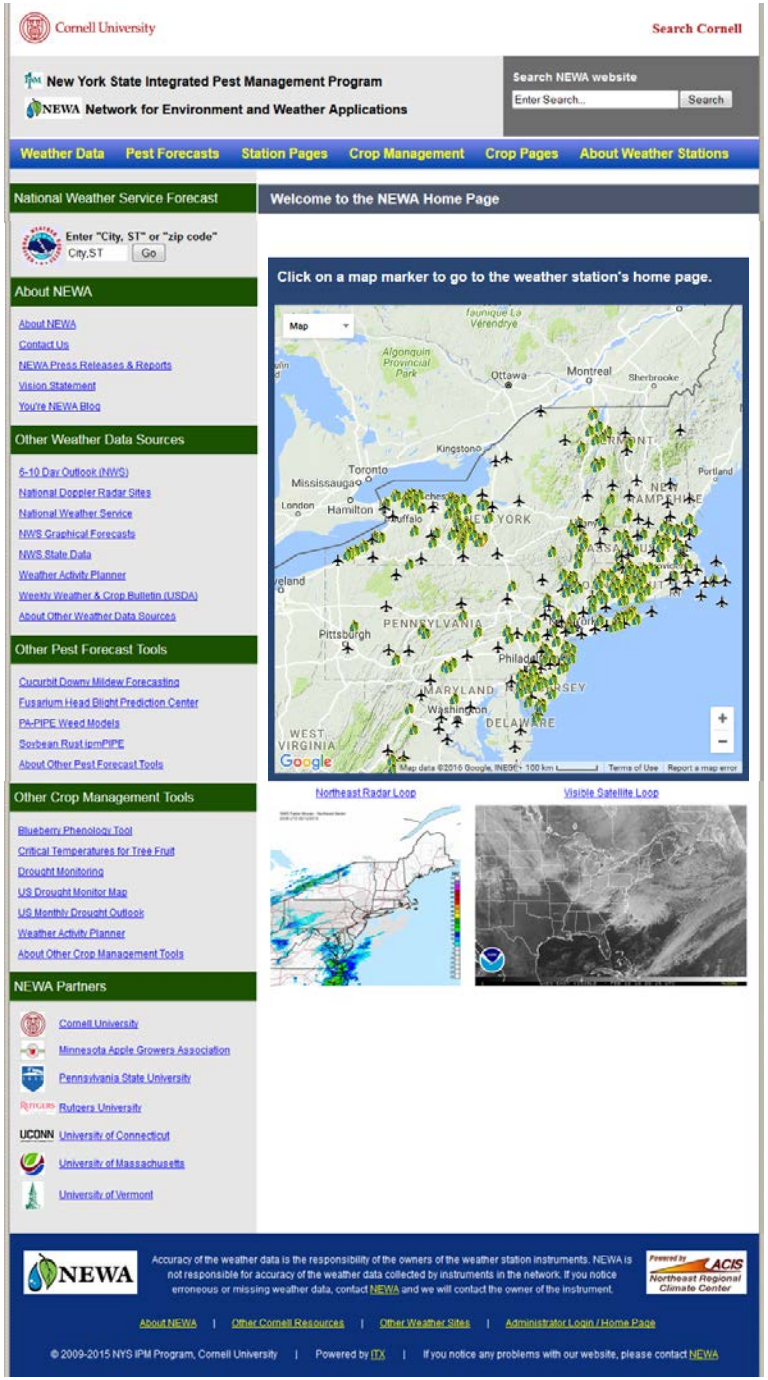
Plus five new berry tools.
Funded by the NYS Berry Growers Assoc!

Top 3 reasons to use NEWA

1. IPM forecast tools for plant diseases & insects
2. Crop management tools
3. Weather data

- Real-time & historical
- Tools show 5-day forecast
- Query-based
- Decision support
- User input biofix
- Interactive user interface

→ *Better IPM, reduced pesticide use, improved environmental protection.*
→ *Better crop management, improved crop quality, improved yield.*
→ *Enhanced decision support.*



NEWA's Home Page

- Blue menu on all NEWA pages
  - Weather Data
  - Pest Forecasts
  - Station Pages
  - Crop Management
  - Crop Pages
  - About Weather Stations
- *Blue menu: **interactive tools***
- The map saves your location

❖ Website rebuild in 2019!

❖ smart phone friendly

Rainwise, Inc. weather stations

Get a NEWA Weather Station

RainWise Inc.
Professional Weather Instruments

Connect to NEWA in CT, MA, MN, NJ, NY, PA, and VT with a RainWise AgroMET & IP100 Weather Station package for $1,890

In addition to Connecticut, Massachusetts, Minnesota, New Jersey, New York, Pennsylvania, and Vermont, individuals in non-member states may also join NEWA, inquire at NEWA@cornell.edu. NEWA makes it possible for farmers, consultants, processors, educators and faculty to share resources for weather data collection, analysis, distribution, and archiving. Read more about connecting to NEWA once you've got your weather station.

NEWA RainWise MKIII stations measure:

Temperature
Dew Point Temperature
Relative Humidity
Rainfall
Leaf Wetness
Solar Radiation
Wind Speed
Wind Direction

The weather station price includes

- 2-year warranty
- Software
- Cables
- Solar panel
- Ethernet interface – **requires high speed internet (DSL, cable, etc.)**
- Non-volatile RAM – prevents data loss during power outage
- 8 integrated sensors – temperature, dew point temperature (relative humidity), tipping bucket rain gauge, leaf wetness, solar radiation, anemometer (wind speed), wind direction, and barometric pressure.

Get the AgroMET (MKIII SP1-LR) with IP-100 Ethernet interface, cost $1,890.
2.4 GHz and up to 1 mile (line of sight) transmission.
The Ethernet IP-100 interface requires high speed internet.
Weather data is sent to RainwiseNet and immediately transferred to NEWA's server.
Prices are based on shipping and billing within the contiguous United States.
Current delivery is 4-6 weeks.
Note: Order the monomount, mounting bracket, separately, approximately $50.

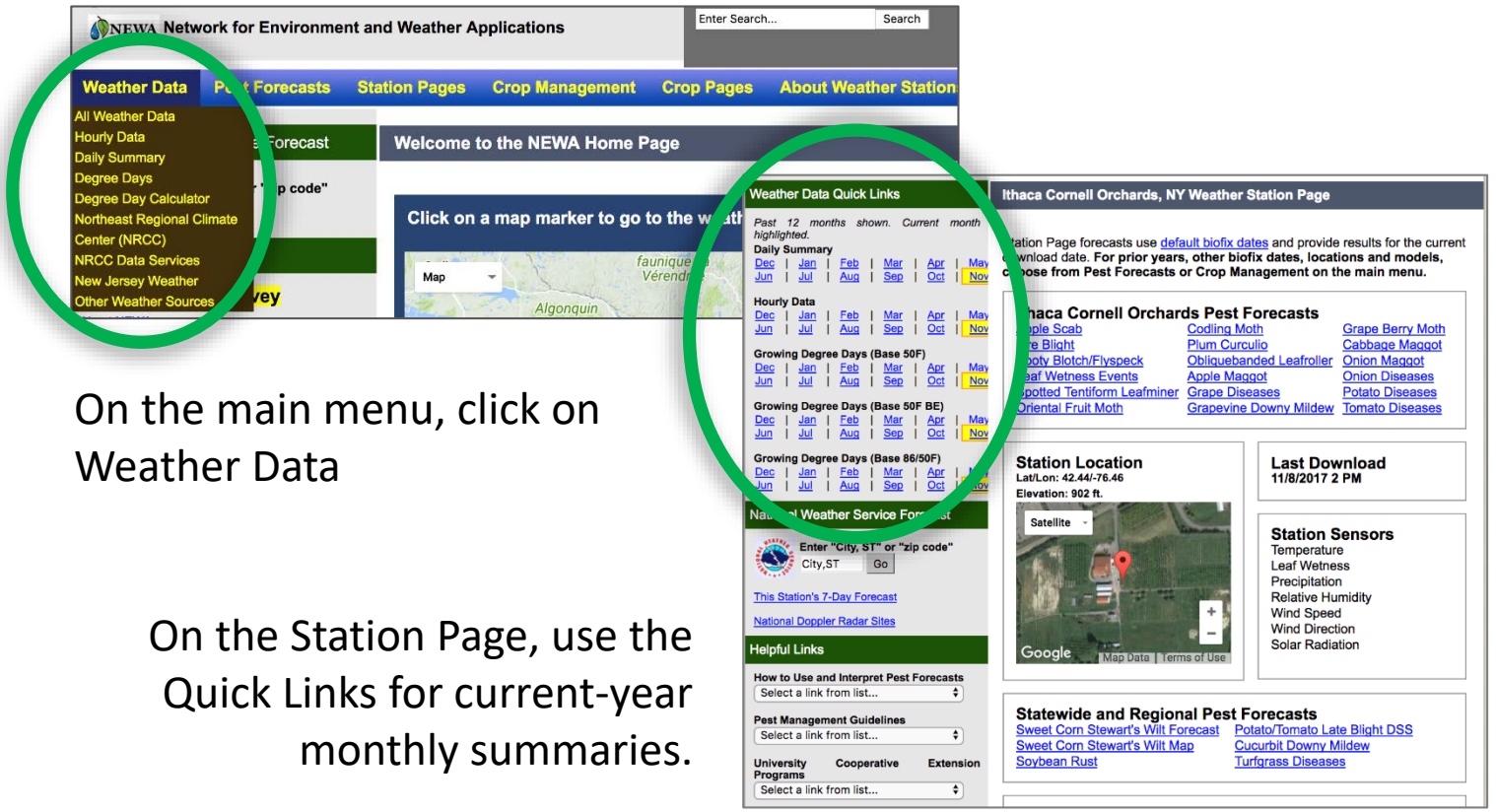
AgroMET options - contact RainWise for more information.
Up to two additional sensors may be added. (ex. Soil Moisture, Soil Temperature)
High gain antenna - optional for sites having radio transmission issues; directional and about 10x more powerful. Can be set up with a longer cord.
Radio Repeater - optional for sites having radio transmission issues; improves signal quality between the LR models, including the AgroMET, and receiving devices in situations where direct line-of-site is not possible or where obstacles impede the transmission of radio signal. Multiple repeaters can be used should this be necessary.
TeleMET cellular telemetry - cellular data transmission for remote locations. Can be added to all LR models, including the AgroMET. Contact RainWise for more information.

About Weather Stations

- Get a Weather Station
- Placement Guidelines
- Maintenance Guidelines
- Troubleshooting Guide

NEWA | newa.cornell.edu
New York State IPM Program

Where to find weather data



On the main menu, click on Weather Data

On the Station Page, use the Quick Links for current-year monthly summaries.

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New York State IPM Program

Hourly and daily weather for the station

Hourly data

Altamont (Indian Ladder Farms)

Date/Time	Temp (F)	LW (minutes)	Rain (inches)	RH %	Dewpoint (F)	Wind Spd (mph)	Wind Dir (degrees)	Solar Rad (langley)	Est I (minu
01/07/2018 11:00	6.1	60	0.00	62	-4	3.5	125	41	0
01/07/2018 10:00	1.0	60	0.00	72	-6	6.7	75	32	0
01/07/2018 09:00	-3.7	60	0.00	81	-8				
01/07/2018 08:00	-7.3	60	0.00	88	-10				
01/07/2018 07:00	-7.2	60	0.00	86	-10				
01/07/2018 06:00	-7.3	60	0.00	83	-11				
01/07/2018 05:00	-7.8	60	0.00	81	-12				
01/07/2018 04:00	-7.7	60	0.00	78	-13				
01/07/2018 03:00	-7.4	60	0.00	75	-13				
01/07/2018 02:00	-7.2	60	0.00	73	-14				
01/07/2018 01:00	-6.3	60	0.00	71	-13				
01/07/2018 00:00	-5.5	60	0.00	69	-13				
01/06/2018 23:00	-4.7	60	0.00	68	-13				
01/06/2018 22:00	-4.5	60	0.00	78	-10				
01/06/2018 21:00	-4.0	60	0.00	80	-9				
01/06/2018 20:00	-2.4	60	0.00	85	-6				
01/06/2018 19:00	-1.0	60	0.00	87	-4				
01/06/2018 18:00	0.0	60	0.00	83	-4				
01/06/2018 17:00	1.2	60	0.00	74	-5				
01/06/2018 16:00	2.7	60	0.00	61	-8				

Daily summary

Altamont (Indian Ladder Farms)

Date	Avg Temp (F)	Max Temp (F)	Min Temp (F)	LW Hours	Total Rain (in)	RH Hrs >= 90%	Avg Wind Speed (mph)	Solar R (langle
Altamont (Indian Ladder Farms) - Daily Data Summary								
1/1/2018	-1.9	8.3	-9.2	24	0.00	5	6.8	282
1/2/2018	7.0	16.9	-8.0	24	0.00	11	4.2	197
1/3/2018	12.9	20.9	-0.3	24	0.00	5	5.7	275
1/4/2018	14.9	19.1	10.8	24	0.00	11	8.4	30
1/5/2018	3.9	12.4	0.2	24	0.00	2	12.3	256
1/6/2018	-0.2	4.5	-4.7	24	0.00	4	12.5	284
1/7/2018	2.1	12.4	-7.8	24	0.00	0	8.4	286
1/8/2018	18.4	22.1	12.5	24	0.00	10	11.5	58
1/9/2018	29.1	35.3	20.4	24	0.00	6	6.8	66
1/10/2018	25.3	35.4	7.9	24	0.00	8	5.2	279
1/11/2018	40.3	47.8	33.3	24	0.00	5	8.0	133
1/12/2018	52.8	60.7	40.1	24	0.44	24	9.0	67
1/30/2018	20.9	25.2	13.9	24	0.00	4	7.6	110
Monthly Summary	21.2	60.7	-9.2	744	1.74	276	6.6	5942

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4 berry models being tested in 2018

insects

- blueberry maggot
- cranberry fruitworm

diseases

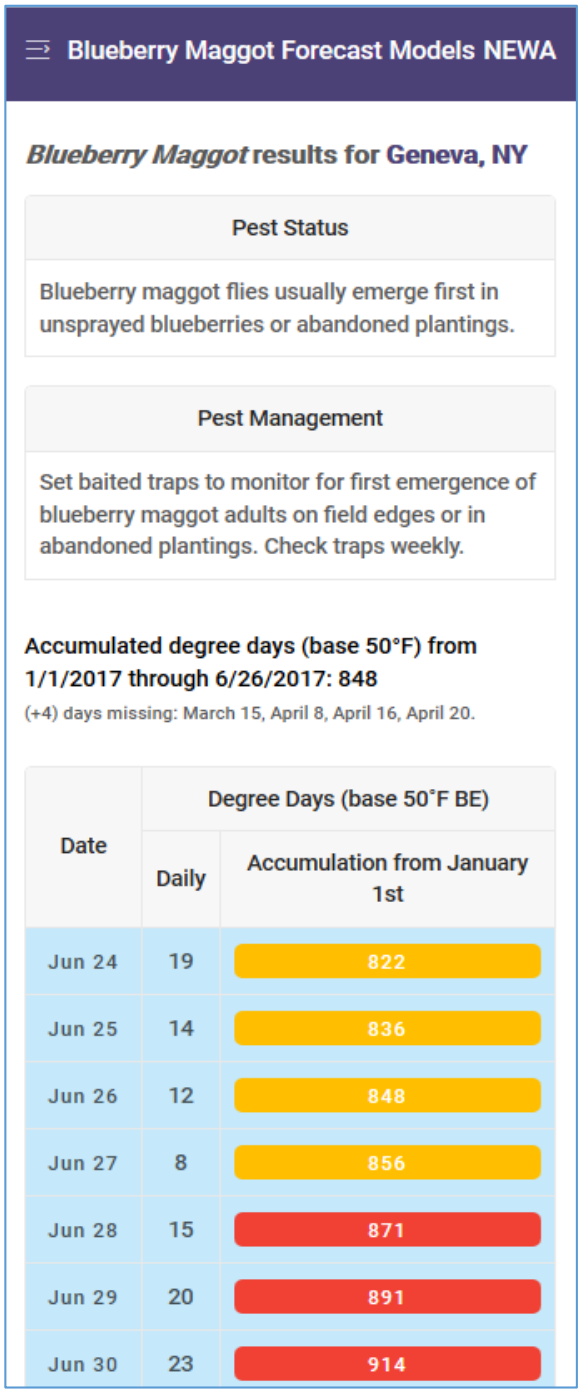
- strawberry anthracnose
- strawberry Botrytis

- mummy berry of blueberry
  - for 2019

You can help test them!
Contact Juliet Carroll, jec3@cornell.edu

Blueberry maggot DD model

- Model predicts emergence of blueberry maggot (BBM) adult flies.
- Based on trap catch data from Michigan State University.
- Used to time placement of monitoring traps for IPM.
- BBM has patchy distribution.
- Will address Canadian Quarantine requirements.
- Field validation in 2018.



Blueberry Maggot Forecast Models NEWA

Blueberry Maggot **results for Geneva, NY**

Pest Status

Blueberry maggot flies usually emerge first in unsprayed blueberries or abandoned plantings.

Pest Management

Set baited traps to monitor for first emergence of blueberry maggot adults on field edges or in abandoned plantings. Check traps weekly.

Accumulated degree days (base 50°F) from 1/1/2017 through 6/26/2017: 848

(+4) days missing: March 15, April 8, April 16, April 20.

Date	Degree Days (base 50˚F BE)	
	Daily	Accumulation from January 1st
Jun 24	19	822
Jun 25	14	836
Jun 26	12	848
Jun 27	8	856
Jun 28	15	871
Jun 29	20	891
Jun 30	23	914

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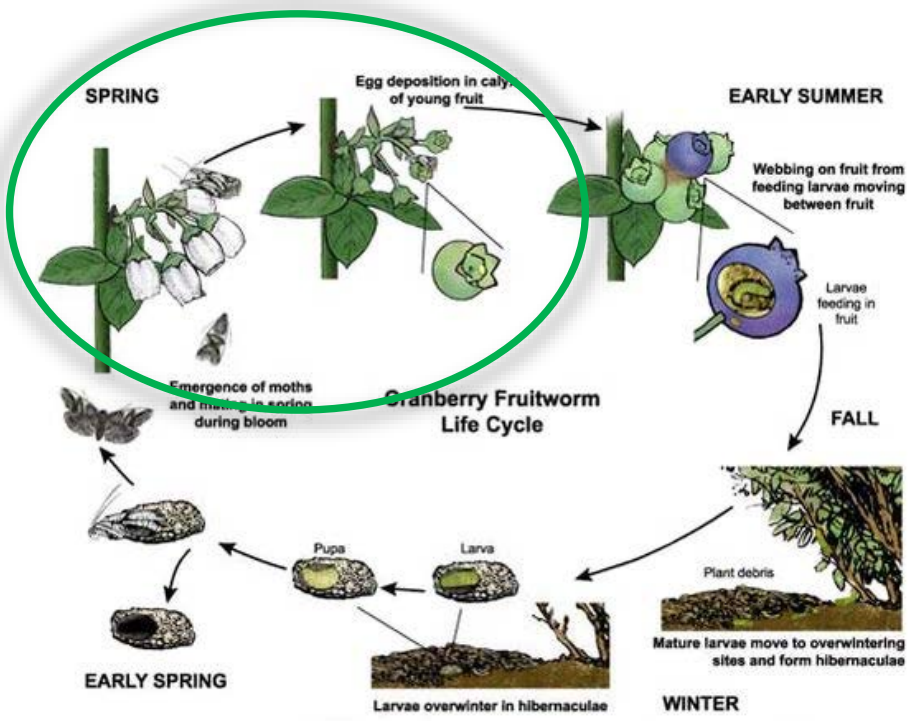
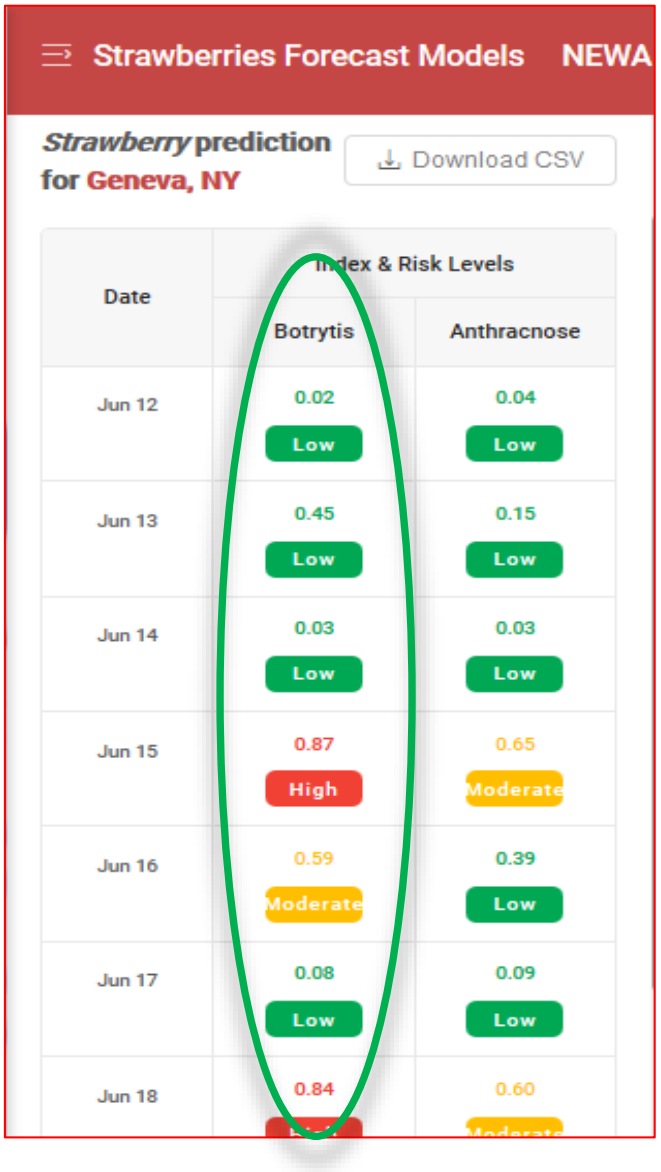
New York State IPM Program

Cranberry fruitworm DD model



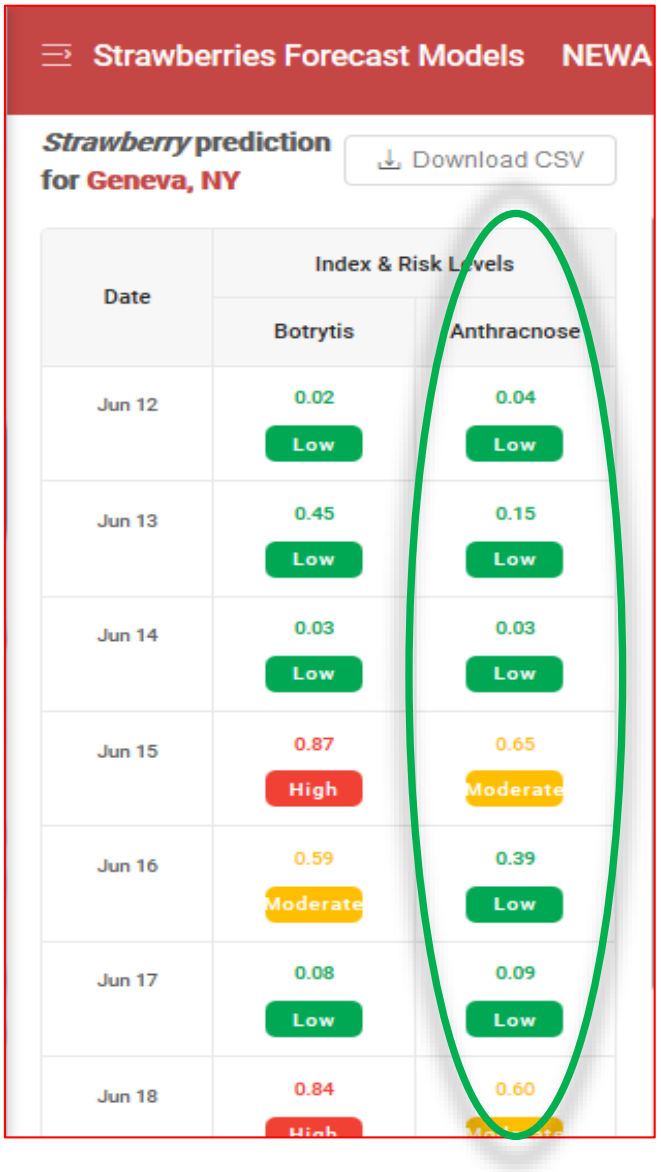
- On blueberry.
- On cranberry.
- Model to time insecticide applications.
- Based on biofix of first trap catch.
- Collaborating with Rufus Isaacs at MSU and Hilary Sandler, UMass Cranberry Station.
- Field validation in 2108.

Strawberry Botrytis (gray mold)



- Model predicts infection risk.
- Based on research at Ohio State University and Florida State University.
- Used to time fungicide applications.
- Will be on the same page with anthracnose risk.
- Field validation in 2018.

Strawberry anthracnose



Strawberries Forecast Models NEWA

Strawberry prediction for Geneva, NY

Download CSV

Date	Index & Risk Levels	
	Botrytis	Anthracnose
Jun 12	0.02 Low	0.04 Low
Jun 13	0.45 Low	0.15 Low
Jun 14	0.03 Low	0.03 Low
Jun 15	0.87 High	0.65 Moderate
Jun 16	0.59 Moderate	0.39 Low
Jun 17	0.08 Low	0.09 Low
Jun 18	0.84 High	0.60

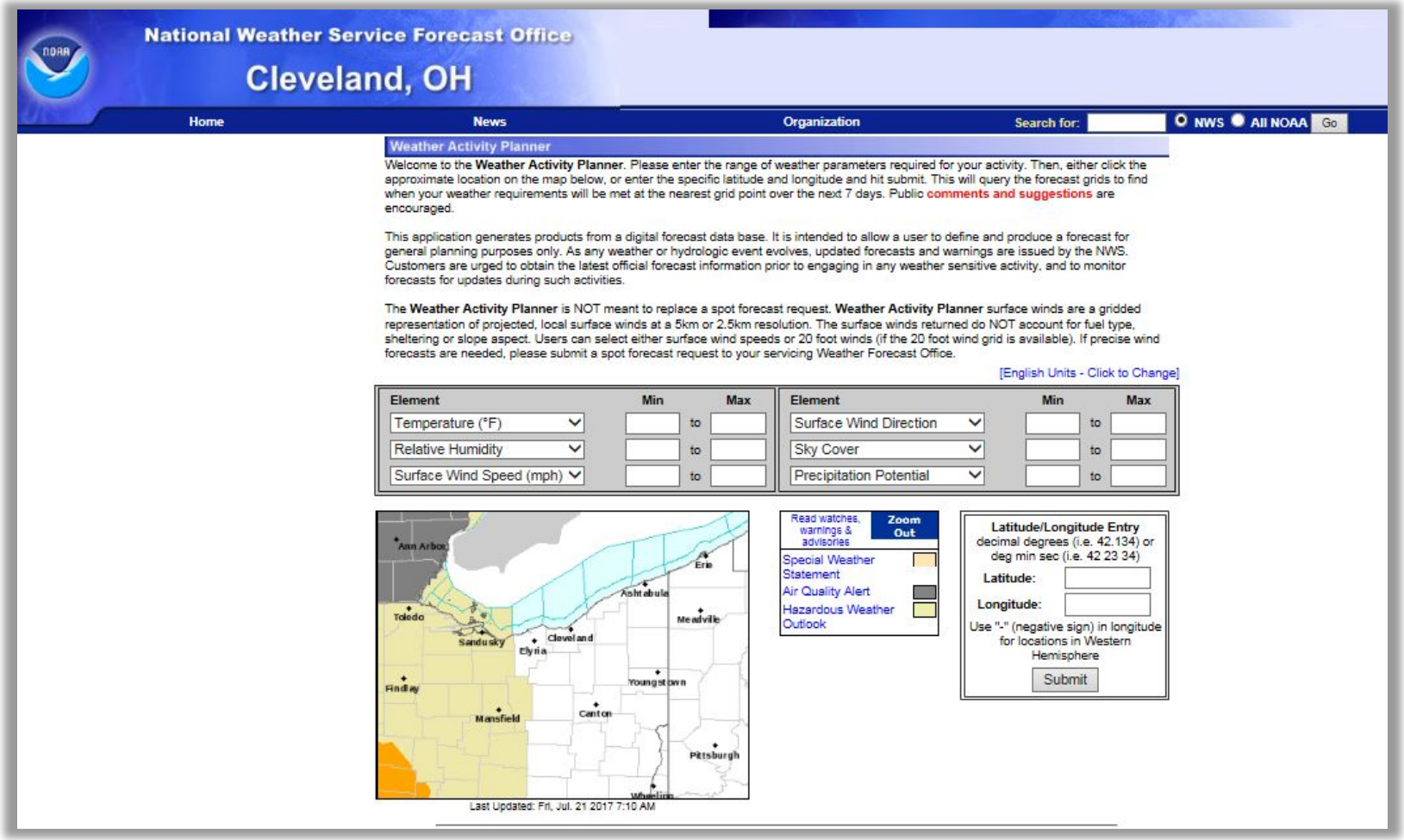
- Model predicts infection risk.
- Based on research at Ohio State University and Florida State University.
- Used to time fungicide applications.
- Will be on the same page with Botrytis risk.
- Field validation in 2018.

Mummy berry of blueberry

- Highbush blueberry.
- Primary infection of emerging shoots.
- Several models in North America.
  - highbush / lowbush
  - primary / secondary infections
- Looking at two possible models for primary infection.
- Field validation in 2019.

Weather Data | Pest Forecasts | Station Pages | Crop Management | Crop Pages | About Weather Stations

NOAA Activity Planner



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New York State IPM Program

Weather Activity Planner

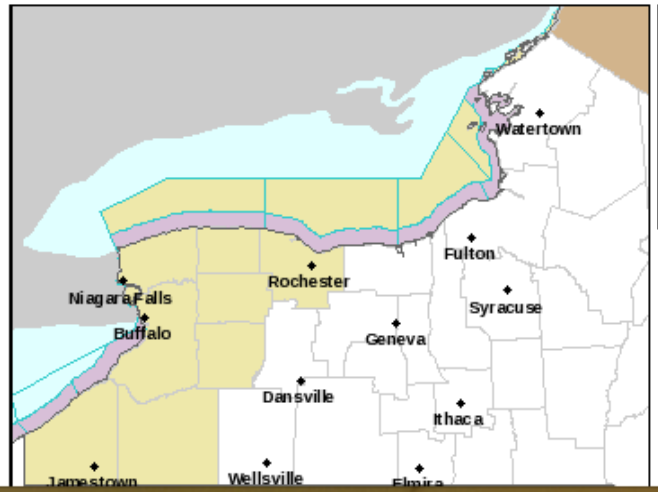
Welcome to the **Weather Activity Planner**. Please enter the range of weather parameters required for your activity. Then, either click the approximate location on the map below, or enter the specific latitude and longitude and hit submit. This will query the forecast grids to find when your weather requirements will be met at the nearest grid point over the next 7 days. Public **comments and suggestions** are encouraged.

This application generates products from a digital forecast data base. It is intended to allow a user to define and produce a forecast for general planning purposes only. As any weather or hydrologic event evolves, updated forecasts and warnings are issued by the NWS. Customers are urged to obtain the latest official forecast information prior to engaging in any weather sensitive activity, and to monitor forecasts for updates during such activities.

The **Weather Activity Planner** is NOT meant to replace a spot forecast request. **Weather Activity Planner** surface winds are a gridded representation of projected, local surface winds at a 5km or 2.5km resolution. The surface winds returned do NOT account for fuel type, sheltering or slope aspect. Users can select either surface wind speeds or 20 foot winds (if the 20 foot wind grid is available). If precise wind forecasts are needed, please submit a spot forecast request to your servicing Weather Forecast Office.

[English Units - Click to Change]

Element	Min		Max	Element	Min		Max
Temperature (°F)		to		Surface Wind Direction	E	to	NE
Relative Humidity		to		Sky Cover		to	
Surface Wind Speed (mph)	1	to	5	Precipitation Potential	0	to	20



Read watches, warnings & advisories | **Zoom Out**

- Red Flag Warning
- Small Craft Advisory
- Wind Advisory
- Hazardous Weather Outlook

Latitude/Longitude Entry
decimal degrees (i.e. 42.134) or deg min sec (i.e. 42 23 34)

Latitude:

Longitude:

Use "-" (negative sign) in longitude for locations in Western Hemisphere

Submit

Select Cities

Buffalo NY
Dansville NY
Elmira NY

Weather Activity Planner for 42.35°N 79.46°W

Interactive

Point Forecast: 3 Miles S Portland NY

Weather Activity Planner

This interactive forecast display is intended for general planning purposes. Data entered may have been changed for accuracy. Please verify the below data is appropriate. All wind direction information should be entered in a clockwise direction (using compass directions i.e. E, ESE, SE, etc). Public **comments and suggestions** are encouraged.

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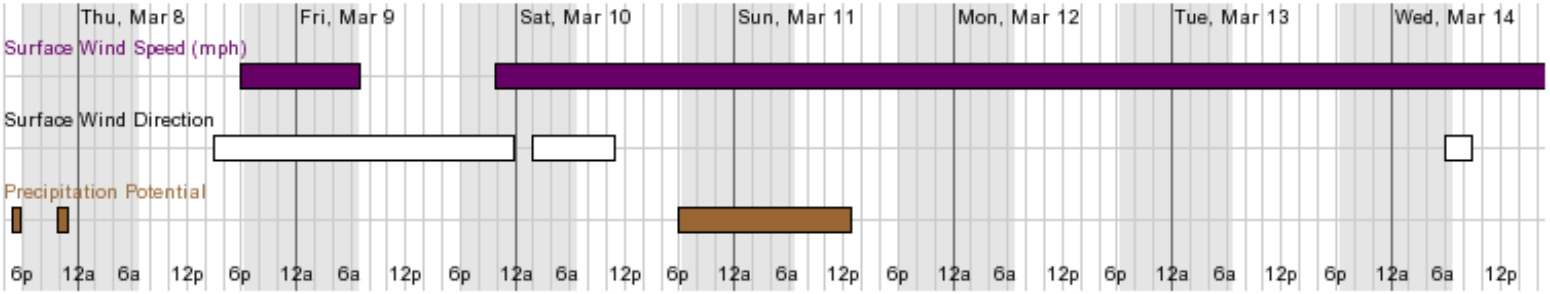


Monday, March 12 at 7pm

Surface Wind: SW 13mph (11kts)

Precipitation Potential: 30%

48-hr Element Meteorogram

Hazardous weather condition(s):

Hazardous Weather Outlook

Element	Min		Max	Element	Min		Max
Temperature (°F)		to		Surface Wind Direction	W	to	NW
Relative Humidity		to		Sky Cover		to	
Surface Wind Speed (mph)	1	to	15	Precipitation Potential	0	to	0

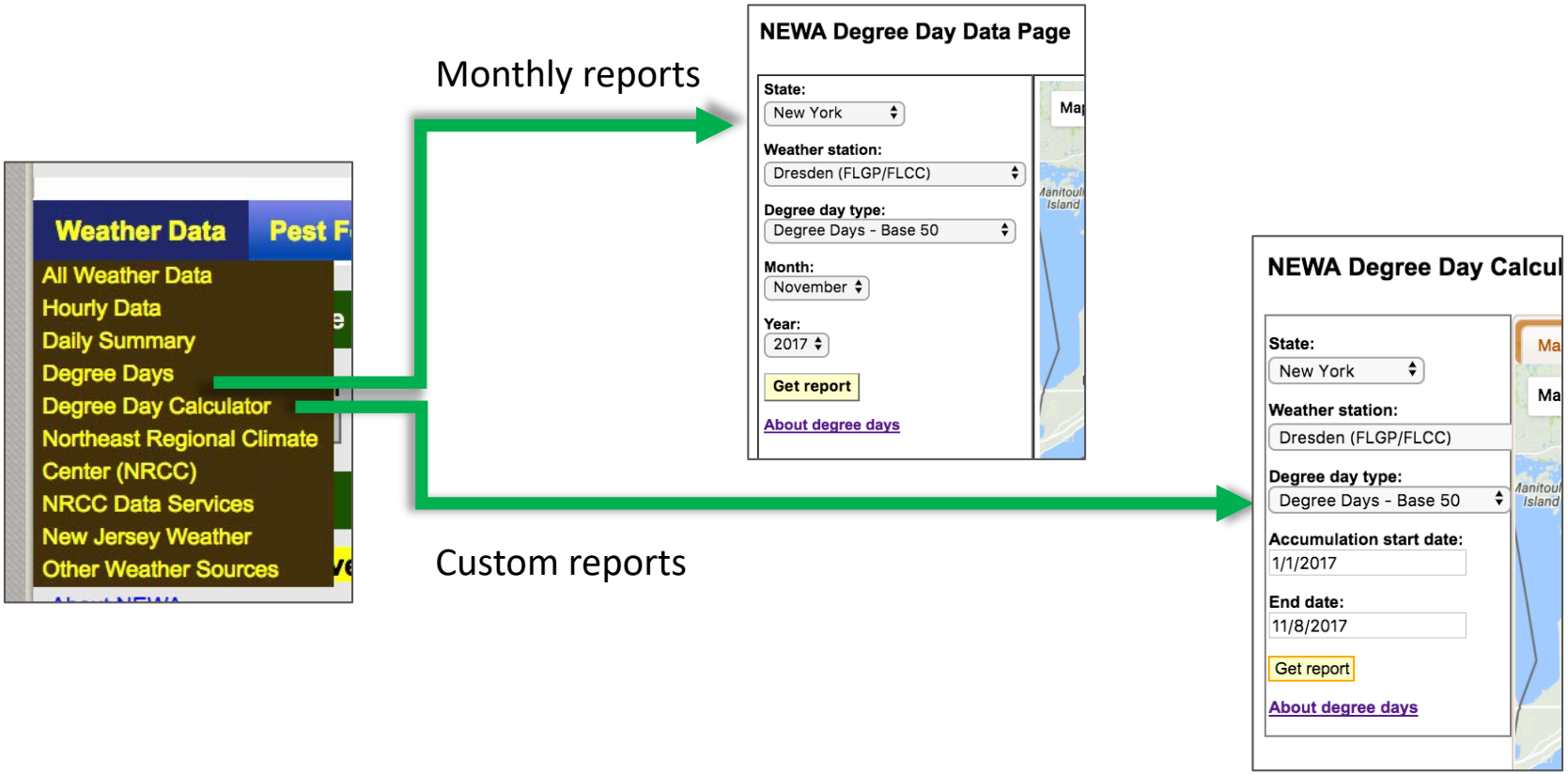
Latitude/Longitude Entry

decimal degrees (i.e. 42.134) or deg min sec (i.e. 42 23 34)

Use "-" (negative sign) in longitude for locations in Western Hemisphere

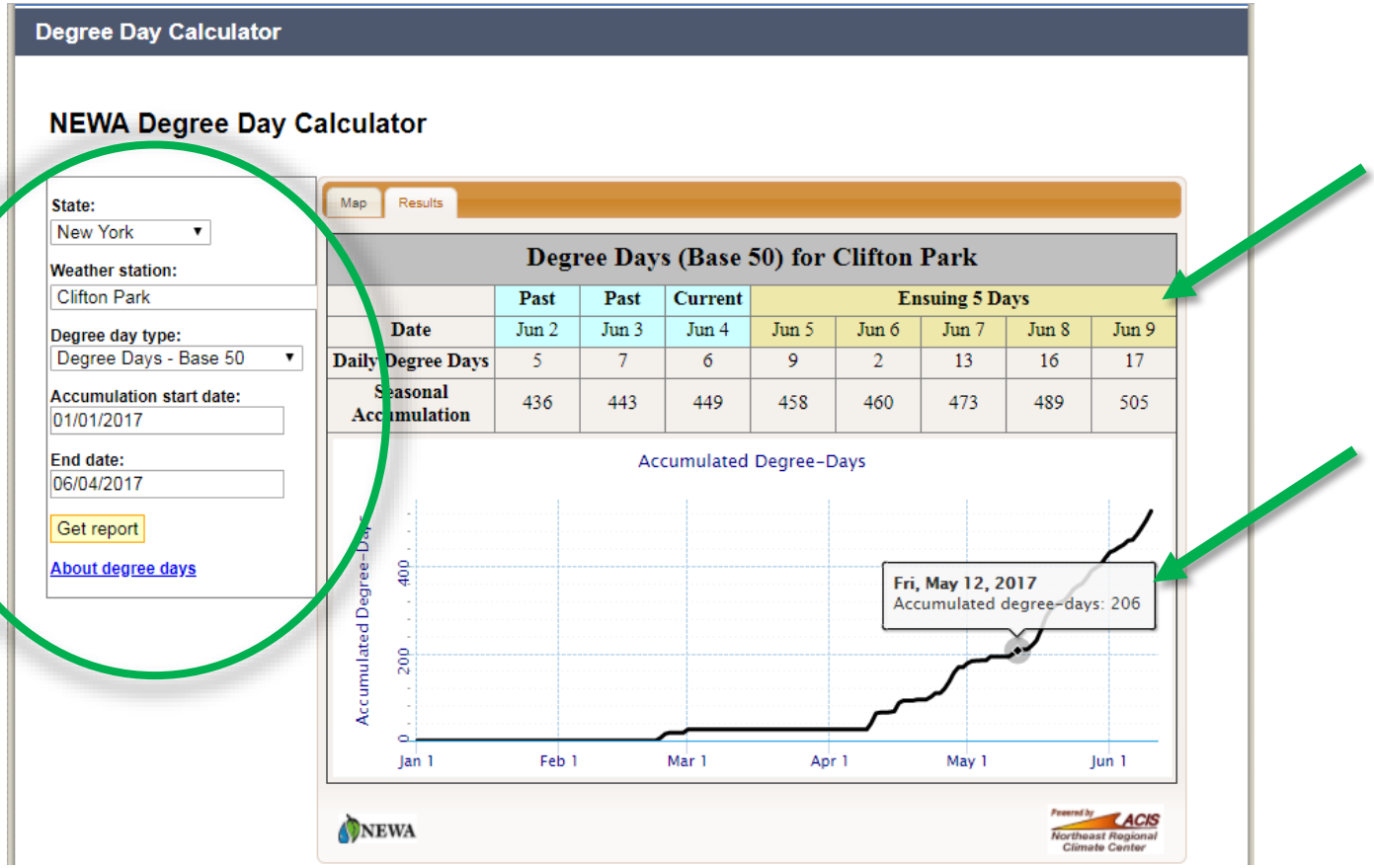
Latitude: 42.3388 **Longitude:** -79.4651 Submit

Degree day tools



Degree day calculator

On the Main menu, click Weather data, select Degree day calculator

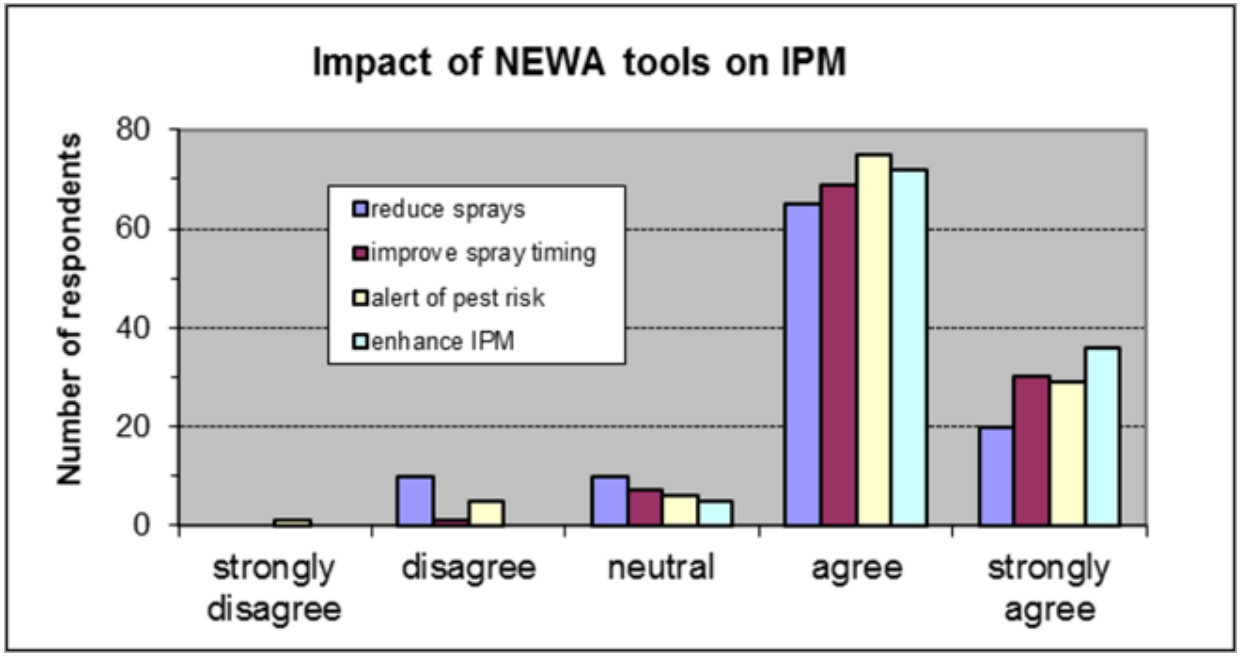


How can people use NEWA tools?

- Pesticide application timing
  - Protect crops when sprays are necessary
  - Protect the environment when sprays aren't necessary
- When to set traps for monitoring insects
- When to scout for plant disease symptoms
- Documentation for crop insurance
  - Freeze damage
  - Disease outbreaks
- Irrigation timing

- Open access
- Real-time
- Query-based
- Decision support

What growers say about NEWA (2007 survey)



Growers can save, on average, $19,500/yr in spray costs and prevent $264,000/yr in crop loss as a direct result of using NEWA pest forecast models.

<u>99% of NEWA users would recommend NEWA to farmers.</u>

New York State Integrated Pest Management Program

NEWA Network for Environment and Weather Applications

Search NEWA website

Enter Search... Search

Weather Data | Pest Forecasts | Station Pages | Crop Management | Crop Pages | About Weather Stations

National Weather Service Forecast

Enter "City, ST" or "zip code"

City,ST Go

National Weather Service Information

NEWA News and Reports

Status Update

News

About NEWA

Questions and Comments

Email us at NEWA

Pest Forecasts

Select a link from list...

Crop Management

Select a link from list...

Crop Pages

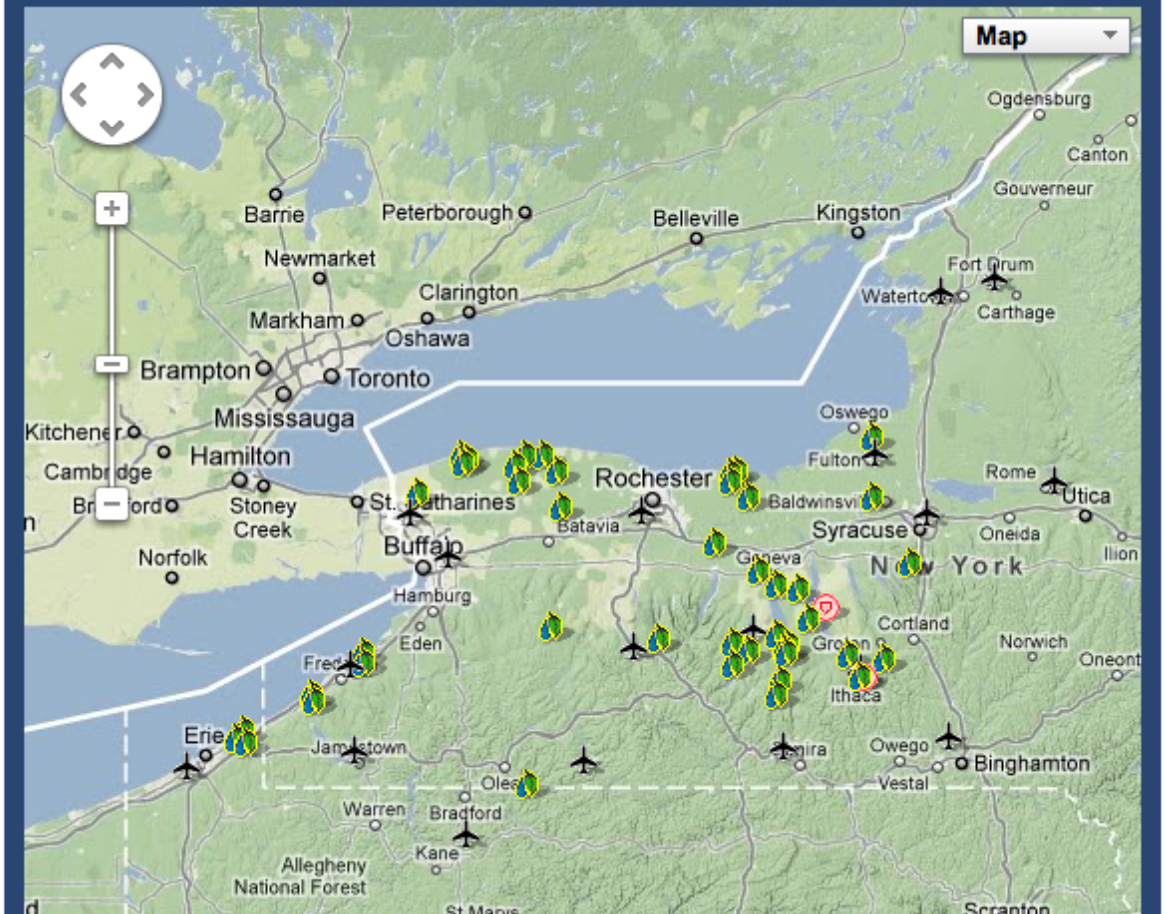
Apples

Grapes

Welcome to the NEWA Home Page

Choose a NEWA weather station home page

Click on a map marker to go to the weather station's home page.



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Thank you! …any questions?

newa.cornell.edu

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