



**Project Name:** Applying weather data and forecasts for managing crop inputs and reducing crop losses.

**Project Number:** RME-DFL02621

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**Project Director:** Juliet Carroll  
Cornell University  
Phone: 315-787-2430  
E-mail: jec3@cornell.edu

**Contact Person:** Lisa Warner  
Cornell University  
Phone: 607-255-8057

**Mailing Address:** 630 W. North St.  
NYS IPM Program  
Geneva, NY 14456  
FAX: 315-787-2360

### **Project Summary:**

Our project covered education on managing the risk of weather in crop production. Weather data is crucial to effective pest management, critical for preventing crop loss, and essential for documenting damaging weather conditions. We upgraded the Network for Environment and Weather Applications (NEWA) at [www.newa.cornell.edu](http://www.newa.cornell.edu), tracked website access, and offered hands-on computer workshops and presentations on NEWA for farmers. Our audience consisted of high-value fruit and vegetable growers in New York, Pennsylvania and Vermont. Six educators conducted up to two workshops each, five educators gave a presentation at their extension meetings and all disseminated information in newsletters. 61 farmers attended workshops and 19 will continue to utilize NEWA weather data and pest forecasts for crop and pest risk management decisions. 1020 farmers attended presentations and over 1800 received newsletters with NEWA information. The improved NEWA website will be utilized by over 1200 additional farmers independently seeking weather risk management applications.

### **Participants:**

Total Number of Participants: 1081

## Results - What Participants Learn, Achieve, Apply

<u>Result(s) that will happen by end of project</u>	<u>Topic</u>	<u>Producer Action</u>	<u>Est. #</u>	<u>Actual #</u>	<u>How Verified</u>
1 Fruit and vegetable growers recruited by extension educators, will participate in one of two NEWA web development committee meeting to learn about NEWA and offer suggestions for desired improvements of the NEWA website to maximize farmer utility for managing weather-related risk. These growers will become NEWA advisors.			36	10	Written documentation during meetings
2 Fruit and vegetable grower participants recruited by extension educators will attend hands-on computer training workshops to learn how to access the improved NEWA website and apply weather information to managing crop and pest inputs to achieve effective pest management, crop loss prevention, and documentation of damaging weather conditions.			200	61	Written evaluation at end of workshops and presentations
3 Fruit and vegetable farmers attending the NEWA computer workshops will use the NEWA weather data technology. These growers will use and apply weather information and pest forecasts for improving IPM practice, reducing crop production risks and for protecting against weather-related losses.	Economic risks of new technologies	Implement	70	19	Phone calls, questionnaire mailings/e-mailings
4 Additional farmers will improve crop production and pest risk management by accessing the NEWA website independently to gain information on weather and pest forecasts essential for managing weather risk. They will apply crucial weather information to managing pests and their crops.	Economic risks of new technologies	Implement	700	1204	Web page tier tracking system

<u>Result(s) that will happen by end of project</u>	<u>Topic</u>	<u>Producer Action</u>	<u>Est. #</u>	<u>Actual #</u>	<u>How Verified</u>
5 Fruit and vegetable farmers that attended the NEWA computer workshops will use and evaluate the NEWA website and suggest areas that need improvement. In addition to using NEWA weather data technology, these growers will become leaders for prioritizing the application of weather information to reduce crop production risk.	Economic risks of new technologies	Implement	30	27	Phone calls, questionnaire mailings/e-mailings
<u>Result(s) that will happen after project</u>	<u>Topic</u>	<u>Producer Action</u>	<u>Est. #</u>	<u>Actual #</u>	<u>How Verified</u>
1 Fruit and vegetable farmers that participated in the NEWA web development committee meetings, the NEWA advisors, will suggest another set of improvements to maximize NEWA utility and applicability to managing weather risk. These grower advisors will contribute their weather risk management knowledge by becoming members of a NEWA Steering Committee.			10	11	Phone calls, e-mail, and written questionnaires
2 Fruit and vegetable farmers that attended the NEWA computer workshops will apply NEWA weather information to achieve improved decisions on weather risk and associated crop management practices.	Economic risks of new technologies	Implement	45	16	Phone calls, questionnaire mailings/e-mailings
3 Fruit and vegetable farmers that attended the NEWA computer workshops will apply NEWA pest forecast information to achieve better IPM practice and improved crop protection.	Economic risks of new technologies	Implement	30	18	Phone calls, questionnaire mailings/e-mailings
4 Farmers will access the new and improved NEWA website independently to gain information on weather and pest forecasts essential for managing weather risks to crop production.			800	1204	Web page tier tracking system

## Project Steps

	<u>What Project Team Did</u>	<u>What Participants Did</u>	<u>Actual Number</u>	<u>When Measured</u>
1	<p>To launch the project, Carroll held two NEWA web development meetings with members of the project team and project participants, one in Eastern and one in Western NY, to introduce the project and gain input on NEWA web improvement. Eastern and Western NY team members will each recruit two to four fruit or vegetable growers that are most likely to agree to serve as NEWA advisors to participate with them in their regional meeting. Eastern and Western NY team members will learn about the NEWA system, provide input on its improvement during the meeting and provide additional feedback through March 2009. Gibbons was invited by the Eastern NY extension educator to give a talk on NEWA, "Using NEWA in Onion Production", to 44 onion growers at the Orange County Onion School in Middletown, NY. Carroll was invited by two Western NY extension educators to give a talk on NEWA, "NEWA Weather Information for Vineyards", to 60 grape growers at the Finger Lakes Grape Growers Conference in Waterloo, NY and 150 grape growers at the Lake Erie Regional Grape Growers Conference in Fredonia, NY.</p>	<p>Fruit and vegetable farmers participated in one NEWA web development meeting, either in Eastern or Western NY, to learn about the NEWA system, provide input on its improvement, begin using NEWA on their farms and to provide additional feedback through March 2009. Onion growers in Orange county and grape growers in the Finger Lakes and Lake Erie regions learned about NEWA and its application to managing crop production and pest risks.</p>	281	Nov 2008 to Mar 2009
2	<p>The team will collate input from growers on suggested improvements to NEWA and provide to Carroll. Team will provide any additional suggestions for improving NEWA weather output to Carroll. Carroll will deliver suggested improvements to Spider ITX, NRCC and NEWA staff to begin developing new website. Team will identify key personnel to write content for the website. The revised website launched at <a href="http://newa.cornell.edu">newa.cornell.edu</a> and <a href="http://www.newa.cornell.edu">www.newa.cornell.edu</a>.</p>	<p>Participants continue to provide any input on NEWA website improvements. Participants will apply their knowledge of crop production to guide team members in best ways to display weather-related risk information on the website, assist with content, and advise on NEWA website development. Participants review the newly launched website.</p>	10	Dec 2008 to Nov 2009

## Project Steps

	<u>What Project Team Did</u>	<u>What Participants Did</u>	<u>Actual Number</u>	<u>When Measured</u>
3	<p>Team members from the NYS IPM Program (Carroll, Petzoldt, Gibbons, Seaman, Weigle) will hold "train-the-trainer" workshops, one each for Eastern and Western NY extension educators. Carroll and Gibbons will develop a NEWA workshop curriculum, workshop evaluation, and other training materials. Potential computer classroom locations will be identified for each extension educator's region. Carroll will present information about the new NEWA website to growers at winter meetings and at the Empire State Fruit &amp; Vegetable Expo booth, NEWA - The Weather Network.</p>	<p>Participants in this case are the ten extension educators, four in Eastern and six in Western NY. Participants will learn how to present a NEWA educational workshop, receive workshop materials and participate in sessions to learn about the new NEWA website with emphasis on fruit or vegetable crops. A faculty member from the Hudson Valley Laboratory in Eastern NY attended the training on using NEWA. Growers learned about the NEWA website offerings for weather and pest management risks and many inquired about obtaining a weather station for their farms and about learning more through the workshops that will be held in their geographic regions by the extension educators.</p>	328	Nov 2009 to Jan 2010
4	<p>The team will hold small, local workshops and give and host presentations for growers to learn about and use NEWA weather and pest forecast information for reducing crop production and pest management risk. Carroll, Petzoldt, and Gibbons will be available to co-teach workshops and give presentations as requested by the extension educators. Curriculum, training materials, and class evaluations will be provided to the educators. Educators will recruit up to 10 growers in the commodity they work in (onions, potatoes, fresh market vegetables, grapes, or tree fruit) to attend each workshop or presentation. One to three workshops or presentations will be conducted by each educator. Workshops will be held in computer laboratories to allow for hands-on learning.</p>	<p>Participants will attend hands-on computer workshops and presentations to learn how to use and apply NEWA weather information for managing crop production and pest management risk. Participants will be encouraged to critique the NEWA web delivery technology to allow for further refinements of the weather risk information delivery system.</p>	361	Dec 2009 to June 2010

## Project Steps

	<u>What Project Team Did</u>	<u>What Participants Did</u>	<u>Actual Number</u>	<u>When Measured</u>
5	The extension educators will conduct follow-up interviews with the growers that attended the workshops to determine if they are using NEWA and applying the information to reduce crop production risk. Educators will utilize NEWA pest forecast information in their extension newsletters to disseminate the information to a larger grower audience. The team will identify and prioritize ways to further improve NEWA. Team members will form a NEWA Steering Committee on weather, climate and agriculture with the Northeast Regional Climate Center (NRCC).	Participants will use and apply NEWA weather and pest forecast information to reducing crop production risk during the growing season. They will achieve improved pest control, reduced spray costs, and documentation of damaging weather conditions. They will provide to the educators suggestions for improvements to NEWA. Participants will become aware of the establishment of the NEWA Steering Committee and have the opportunity to serve on this committee.	27	Apr to Jul 2010
6	Carroll will conduct phone interviews with the project team and collate all suggested improvements to the NEWA website and prioritize them for deployment. Spider ITX and NEWA staff will revise the website accordingly. NEWA staff will track and report web page visits.	Participants will self appoint as members of the NEWA Steering Committee to apply their knowledge to the improvement of weather risk reduction technology for the fruit and vegetable industries in New York.	8	May to Jul 2010

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## Progress Notes

Thursday, July 15, 2010

During these last months, Cornell Cooperative Extension educators conducted workshops, organized presentations, and wrote newsletters articles with NEWA information. They did follow-up evaluations on NEWA's utility with vegetable and fruit growers who attended their workshops and presentations. At least six educators delivered daily or weekly NEWA information through their newsletters, reaching an audience exceeding 1800 people across NY, Pennsylvania and New England. A targeted newsletter article on the use of NEWA circulated in the vegetable extension news.

Farmers utilized NEWA weather data for crop production, pest forecast models, and agricultural risk management.

Workshop evaluation results from 42 farmers, out of 61 that attended 9 workshops on the upgraded NEWA website--

Workshop effective at teaching about NEWA: 81% very effective; 19% effective.

Teaching pace: 95.2% just right, 4.8% too fast.

Presentation clear: 100% yes.

Appropriate content: 100% yes.

Easy to use NEWA website: 90.5% yes, 9.5% not sure yet.

Website ease of navigation: 51.3% excellent, 48.7% good.

Suitable website layout: 43.6% excellent, 53.8% good, 2.6% average.

Logical grouping on website: 48.7% excellent, 51.3% good.

Additional training: 19%, in the following areas--

Weather station installation (2).

Which station location to use.

How to use solar radiation values.

How to apply the information.

More practice using pest forecast models.

Using DMcast for grapevine downy mildew.

Information on any upgrades.

Follow-up evaluations on the use of NEWA, from 18 farmers, out of 61 that attended 9 workshops on the upgraded NEWA website--

Crops grown:

8-grape.

5-potato & other veg.

3-onion & other veg.

1-onion.

1-apple.

Easy to use NEWA website: 100% yes.

Website ease of navigation: 42.9% excellent, 50.0% good, 7.1% average.

Suitable website layout: 35.7% excellent, 50.0% good, 14.3% average.

Logical grouping on website: 42.9% excellent, 50.0% good, 7.1% average.

NEWA bookmarks (9 respondents): Home page (5), Hourly data (2), Daily summary (1), Station pages (1).

How often NEWA used: once/day 14.3%, once/week 71.4%, once/month 7.1%, rarely 7.1%.

Favorite feature of NEWA: IPM forecasts (6), growing degree days (GDD) (3), weather data (2), weather forecasts (2), crop models (1), station pages weather (1).

100% used NEWA weather data, IPM forecasts, crop pages, and NWS forecasts.

91.7% used station pages and 92.3% used crop management pages.

IPM forecasts and crop pages used were specific to the crops grown.  
Growing degree days, degree days, and daily summary weather data were most popular.  
Was NEWA information applied to...  
...reduce crop production risk: yes 81.8%, no 18.2%.  
...document crop-damaging weather conditions: yes 54.5%, no 45.5%.  
...achieve improved pest management: yes 90.9%, no 9.1%.  
...improve spray timing: yes 90.9%, no 9.1%.  
...reduce seasonal spray costs: yes 70.0%, no 30.0%.  
...reduce the number of sprays applied: yes 72.7%, no 27.3%.  
NEWA benefits farm risk management: yes 90.9%, no 9.1%  
Quotes from the follow-up surveys are included in "Stories/Examples".

The programming bugs on the NEWA Station Pages were fixed and the website work was officially completed. The website is fully upgraded and all the content has been migrated into it and, as suggestions arise, new content is being posted. The NEWA system is now reaching into Vermont and Massachusetts.

This spring NEWA served a key risk management function as several spring frosts occurred across New York's fruit-growing region, impacting fruit trees, grapes and berry crops. Growers, crop consultants, extension educators, and research faculty utilized the NEWA temperature data to determine the likelihood of crop damage from the cold temperature events.

The NEWA Steering Committee, formed through this project, includes:  
8 farmers, 9 extension educators, 1 private consultant, and 17 faculty.

Thursday, April 29, 2010

Thursday, April 29, 2010

Cornell Cooperative Extension Educators conducted educational workshops, gave presentations and wrote newsletter articles about the Network for Environment and Weather Awareness (NEWA) website's weather risk management and pest forecast models and the new website. These workshops will be finishing up within the next few weeks and the evaluation results collated. Final numbers on workshops and participants will be included in the final report.

In response to the improvements to the NEWA website and our educational efforts targeting growers, 14 new weather stations have been installed in the NEWA network with two more pending.

One grape grower said that he really likes the website and has been looking at the weather data daily from his site and comparing it to other sites nearby. An apple grower said the website is right on target for delivering the needed IPM risk and weather risk information.

Wednesday, February 24, 2010

Monday, February 1, 2010

The new Network for Environment and Weather Awareness (NEWA) website was launched in November, 2009, and two url's secured from Cornell University for its address, [newa.cornell.edu](http://newa.cornell.edu) and [www.newa.cornell.edu](http://www.newa.cornell.edu). Redirects from the old url [nysaes.newa.cornell.edu](http://nysaes.newa.cornell.edu) were set up to take people to the new website. We are in the process of learning the content management system and working out a few remaining bugs in the website with Spider ITX and the Northeast Regional Climate Center to ready the website for the growing season.

Train-the-Trainer workshop materials were developed including agendas, curricula, a next steps guide, and evaluation materials for two Train-the-Trainer workshops held, one each, in eastern NY and western NY. Our audience consisted of the Cornell Cooperative Extension (CCE) educators on the project who will conduct NEWA workshops and follow-up sessions with fruit and vegetable growers this winter and spring.

As a result of the Train-the-Trainer sessions, Carroll was invited to present information on NEWA to apple



growers at two Lake Ontario Winter Fruit Schools, reaching an additional 225 growers. CCE educators also spearheaded obtaining pesticide applicator license credits from the NY State Department of Environmental Conservation for the growers who will attend their workshops because the pest forecast models and weather information in NEWA enhance growers' decisions regarding pesticide applications and the "DEC credits" are a big draw for attendance. Also, CCE educators suggested Carroll have a booth featuring NEWA at the Empire State Fruit and Vegetable Expo, Syracuse, NY, January 26 and 27. For this booth we developed a large vertical banner-poster featuring NEWA and reached an additional 92 farmers with information about the new NEWA website and risk management information.

Wednesday, October 21, 2009

Spider ITX and NEWA personnel have developed the new website for NEWA based on the design templates completed by Spider ITX. All content has been migrated into the test website and we are in the process of proof-reading it. Spider ITX will train NEWA personnel in use of the Content Manager System of the new website on November 13. We anticipate launch of the website around that time.

The Soil and Water Conservation District of Seneca County received from grape growers an overwhelming response to its announcement of funding assistance for weather stations that connect to NEWA forecast models for crop protection and production. Nine new weather stations will be installed by wine grape growers in Seneca county, including several with award-winning wines. This may have been in response to a presentation by Carroll, "Weather Information for Vineyards – Available on NEWA" at the Finger Lakes Grape Growers Conference organized by Hans Walter-Peterson in March. This outcome underlines the importance of weather information to vineyards for managing risk.

Friday, May 01, 2009

Friday, May 1 2009

During this quarter we started working on grower educational workshop curriculum materials and the revisions to the NEWA website suggested by growers and extension educators.

Spider ITX completed design templates for the NEWA website developed. NEWA Home Page design is nearing completion, but the launch of the website will likely not occur until June 1. Delays with website development have delayed grower educational workshops.

A NEWA Advisory Group of 35 faculty, educators, and producers was established.

Friday, January 30, 2009

During this quarter, Carroll, Ten Eyck and Gibbons completed the development of all the materials for the two regional NEWA review meetings, including a Fruit NEWA Review Tutorial, a Vegetable NEWA Review Tutorial and a Review Meeting Evaluation Form. A list of handout support materials was developed.

Two NEWA Review meetings were held on November 17 and 20 with extension educators, growers, and consultants. Twenty-three attendees participated in reviewing the NEWA website and the pest and weather risk factors available, nine in Eastern NY and 14 in Western NY. Written reviews were collected and results entered into a spreadsheet. Reviews of the website by growers are still pending from four participating extension educators.

Evaluation of the meetings:

65% thought it was very effective, 25% effective, way to review the website.

95% thought the pace was just right, 5% too slow.

All thought the presentation was clear and understandable.

Only 5% thought the content was not appropriate for reviewing the website.

70% of attendees agreed to serve as NEWA Advisors.

Carroll worked with Spider ITX to finalize a Statement of Work for the NEWA website upgrade. This upgrade is going forward with our first meeting on Feb 5. The upgrades will be based on and driven by the website reviews and the NEWA Advisory Group. Carroll, TenEyck and Gibbons have begun to develop improved web content for the upgrades. Target date for launch of the upgraded website is March 20.

Impact of this project will be enhanced by three other weather-based predictive model projects that utilize NEWA data, one on apple pests and diseases, one on potato late blight, and another on grape model improvements for IPM and viticulture.

Friday, October 31, 2008

Carroll was unable to call the NEWA web development meetings in August and September as planned. Instead, meetings have been scheduled for November 17 in Jordan Hall, NY State Agricultural Experiment Station, Geneva, NY for the Western NY team and for November 20 in Cornell Cooperative Extension Association Office, Saratoga County, Ballston Spa, NY for the Eastern NY team. Meetings will be approximately three hours long and will be run by Carroll, Gibbons, TenEyck, Petzoldt, and Seaman.

Concerns expressed by extension educators on the teams regarding their ability to recruit growers to attend the meetings caused Carroll to revise the project steps to allow educators to either bring growers or crop consultants to the review meeting or meet with them one-on-one to review the NEWA website in the two weeks immediately following the review meeting.

Carroll, TenEyck and Gibbons are in the process of developing the NEWA Review Meeting Tutorial and Questionnaire which will be used during the meetings and be given to educators to use one-on-one with growers. We are also revising the NEWA brochure and developing a set of handouts and promotional materials to provide to meeting attendees. All the materials are still in draft phase and were not uploaded for this first progress report in the Promotional Materials or Educational Materials sections.

## Promotional Materials

### **Network for Environment and Weather Applications Brochure**

Material Type: Promotional Material

A tri-fold brochure describing the NYS IPM Program's Network for Environment and Weather Applications (NEWA). It is written for agricultural audiences, primarily farmers of high-value horticultural crops and their extension educators.

This material has been uploaded to the Ag Risk Library.

### **Impact of the NYS IPM Program's Network for Environment and Weather Awareness (NEWA) on Agricultural Production**

Material Type: Promotional Material

This is a report on a survey of the Network for Environment and Weather Awareness (NEWA) users that documents its impact on agricultural production and risk management. The survey report provided background information on NEWA for educators and growers attending the NEWA review meetings and workshops.

This material has been uploaded to the Ag Risk Library.

## Educational Materials

### **NEWA Vegetable Workshop - curriculum**

John Gibbons and Juliet Carroll  
NYS IPM Program, Cornell University, December 2009, Material Type: Curriculum (9 pages).

A curriculum for educators to utilize during workshops for vegetable growers covering the use of the Network for Environment and Weather Applications (NEWA) website.

This material has been uploaded to the Ag Risk Library.

### **NEWA Fruit Workshop - curriculum**

John Gibbons and Juliet Carroll  
NYS IPM Program, Cornell University, December 2009, Material Type: Curriculum (8 pages).

A curriculum for educators to utilize during workshops for fruit growers covering the use of the Network for Environment and Weather Applications (NEWA) website.

This material has been uploaded to the Ag Risk Library.

### **NEWA Grower Workshops Agenda**

Juliet Carroll  
NYS IPM Program, Cornell University, December 2009, Material Type: Other (1 pages).

A sample agenda for educators to utilize for planning workshops on the use of the Network for Environment and Weather Applications (NEWA) website for grower audiences.

This material has been uploaded to the Ag Risk Library.

### **NEWA (Network for Environment and Weather Awareness) 2007: A Year in Review**

John Gibbons, Juliet Carroll, Cheryl TenEyck, Curt Petzoldt and Tim Weigle  
NYS IPM Program, 2008, Material Type: Publication (4 pages).

This is the 2008 yearly technical report about NEWA filed by the NYS IPM Program to document activities. It was used as an educational material for growers and educators because it describes the activities of NEWA and provides background information about the network.

This material has been uploaded to the Ag Risk Library.

## Educational Materials

### **NEWA - Network for Environment and Weather Applications**

Juliet Carroll, John Gibbons, Cheryl TenEyck, Keith Eggleston, William Noon, Curt Petzoldt, Tim Weigle and Arthur DeGaetano

NYS IPM Program, Cornell University, November 2009, Material Type: Web Site

The NEWA website provides pest forecasts, weather data, links to weather information, weather station pages, and other weather-related resources for agricultural producers to inform crop and pest management decisions. It is a web site built with data collected from producer-owned weather stations that is run through degree day calculations, monthly summaries, and pest and disease forecast algorithms.

<http://newa.cornell.edu>

Available on the internet via open access to any user.

## Evaluations and Reports

### **NEWA Review Meetings - Fruit Tutorial & Questionnaire**

November 2008, Material Type: None Selected

This document was used to educate fruit growers and extension educators about the Network for Environment and Weather Awareness (NEWA) website as well as provide a platform for evaluating NEWA.

This document is not viewable in the Ag Risk Library.

### **NEWA Review Meetings - Vegetable Tutorial & Questionnaire**

November 2008, Material Type: None Selected

This document was used to educate vegetable growers and extension educators about the Network for Environment and Weather Awareness (NEWA) website as well as provide a platform for evaluating NEWA.

This document is not viewable in the Ag Risk Library.

### **NEWA Review Meeting Evaluation**

November 2008, Material Type: None Selected

This is the evaluation form that growers and extension educators completed at the Network for Environment and Weather Awareness (NEWA) website review meetings.

This document is not viewable in the Ag Risk Library.

### **NEWA (Network for Environment and Weather Awareness) 2008: A year in review.**

2009, Material Type: None Selected

This is the 2008 technical report for the Network for Environment and Weather Awareness (NEWA) describing all of its activities for the year. The report is filed annually with the NYS IPM Program.

## Evaluations and Reports

### **NEWA Workshop Evaluation**

December 2009, Material Type: None Selected

This is an evaluation form that growers will use to evaluate the workshops on the Network for Environment and Weather Awareness (NEWA) held by the extension educators.

### **NEWA follow-up with growers**

December 2009, Material Type: None Selected

This is an evaluation form that extension educators will use to conduct follow-up interviews and visits with growers to assess what the outcomes of their using the NEWA system to manage weather, crop, and pest risks on their farms.

### **NEWA (Network for Environment and Weather Applications) 2009: A Year in Review**

2010, Material Type: None Selected

This is the technical report of the Network for Environment and Weather Applications (NEWA) for year 2009 documenting all of its activities. The report is filed annually with the NYS IPM Program.

## Project Comments

Describe any unexpected results of the project:

The interest in NEWA has gained great momentum within the fruit and vegetable industries, especially in grape production, over the duration of this project.

This project had good synergy with three other projects on NEWA pest forecast model development in potatoes, apples and grapes.

Four out of 10 extension educators preferred to give presentations on NEWA at their extension meetings. This precluded determining if these farmers implemented the NEWA information that was learned.

Farmers are very interested in growing degree days (GDD). We found out that there is need for background information on GDD, the various equations used to calculate GDD, and why there can be relatively large discrepancies in accumulated GDD between two weather station locations even though they are close to one another.

Explanation of discrepancies in the results numbers (projected vs. actual):

1. There were fewer growers (10 actual versus 36 projected) participating in NEWA web site development than projected because 4 out of 10 extension educators did not bring growers to the web site review meetings.
2. There were fewer growers (61 actual versus 200 projected) participating in NEWA educational workshops projected because 4 out of 10 extension educators did not conduct workshops. However, more producers were reached through oral presentations on NEWA given by educators, Carroll and Gibbons. Educators gave presentations on NEWA, either instead of or in addition to workshops, and reached 300 growers. Carroll and Gibbons gave presentations on NEWA and reached 720 producers. Overall, we reached 1081 participants through workshops and presentations.
3. We anticipated that 70 growers would apply NEWA information, but reported an actual number of 19. This is because only 61 attended the NEWA workshops that would then allow for follow-up interviews. Of these 61 attendees, the follow-up interviews were done with 19 growers. All of these indicated they would continue to use the NEWA weather data technology, a 100% result. It was not possible to determine what proportion of the 1020 growers attending presentations on NEWA would use the NEWA web site technology because no mechanism was used to obtain this information.
4. We estimated that web page use statistics would show 700 web page downloads from the NEWA web site. We were pleased that the number was higher, showing a total of 1204.
5. We were very close to our estimate of 30 growers who would use and evaluate the web site and then become leaders for NEWA. 19 growers provided NEWA usage feedback and 8 growers became members of the NEWA Steering Committee.



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How would you improve the project if you were to do it again?

The timing of the project was difficult. It would have been best to end the project in November to allow more time for follow-up with farmers after the growing season when NEWA information would have been utilized.

Develop better supporting information on how to apply and use the weather information.

More funding - NEWA web improvement suggestions could not be implemented due to a reduction in the requested budget.

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What were the keys to success for your participants?

Familiarity with computer technology.

Willingness to learn and use something new.

Proximity to a weather station location.

## Individual Stories / Examples of Success / Quotes

One grape grower said that he really likes the website and has been looking at the weather data daily from his site and comparing it to other sites nearby.

An apple grower said the website is right on target for delivering the needed IPM risk and weather risk information.

Quotes from the follow-up evaluations in answer to the question, "Do you think NEWA benefitted your farm risk management? If yes, describe.":

I was able to make more informed decisions on timing of grape berry moth sprays. Later in the season, I plan to use the downy mildew forecast to determine whether downy mildew sprays are necessary. I can also more accurately track growing degree days in my immediate area.

(Grape grower) Risk management improved from spray timings. Possibility exists for reduction in number of sprays, but must be experienced enough to know ramifications.

Helped me know when onion diseases were climbing (i.e. risk increasing).

Helped me keep track of things -- difficult with so many crops (onions, potatoes, tomatoes, sweet corn, cabbage, cucurbits, berries, other veg)

NEWA provided us with specific information to our crop (onions) that other weather programs do not provide.

Have not used yet, but looks like a useful tool that will be used more in the future.

Used mostly the late blight forecast (potatoes).

Used GDD information to track insect/disease modeling and sustainable spray practices.

Biggest single value and reason I invested in a weather station is the carbohydrate model produced by Dr. Terence Robinson for apple. Has a major impact on the total crop value. Best information of any kind anywhere in the world for apples!!!

**IT'S A GREAT RESOURCE TO DIRECT GROWERS TO!**

### How did the project leverage resources?

RME grant funds allocated:	\$30,000
RME grant funds expended:	\$30,000
Other funds used for the project:	\$0
Non-cash resources:	\$0

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### Delivery area:

This project was delivered in 3 states: New York, Pennsylvania, Vermont