Project Summary/Abstract.

(i) Project Type: Extension

(ii) Summary Statement.

This is an Extension project with two main objectives.

The first objective is to provide interdisciplinary education in pest management to northeastern US berry crop growers. Pest management topics identified by grower groups, IPM advisory teams and project collaborators will be prioritized. Small fruit pests that may be addressed will be those posing the greatest challenge to northeastern growers, and those pests that have been the focus of recent research projects. Topics chosen will be presented by the regional expert who will also address ongoing research efforts.

Berry crops including strawberries, blueberries, bramble fruits, cranberries, currants, gooseberries, and other minor fruits may be addressed. The emphasis will be on berry crops of greatest economic importance or crops that show the most potential for growth in the northeast region. Berry crops have been chosen because they are a high value crop and continued competitiveness of specialty crop production is a key issue in maintaining viable agriculture in rapidly urbanizing areas of the northeastern US.

The second objective is to explore the utility of webcasting technology. We will investigate if interactive, "real-time" web seminars will be accepted by growers as a valuable and effective approach to grower education. We will also evaluate if this technology allows agricultural researchers and extension faculty greater ability to utilize diminishing extension budgets. Results of the evaluation of our second objective will be shared with researchers in other commodity groups.

Project Narrative

1. Part 1

Problem: This project proposal, *Using webcast training to advance interdisciplinary approaches to small fruit pest management*, addresses two primary problems. 1) a need to improve the level of awareness, understanding and adoption of pest management techniques by berry growers and 2) accomplishing the first objective in an age of dramatic reduction of extension staff, shrinking budgets and with expertise scattered across states within regions.

Berry crops have enjoyed a resurgence of interest by retail consumers in the past several years. The combination of the "Eat Local" movement along with very favorable nutritional composition make berries an attractive crop for the retail farm market as well as the growing domestic wholesale market. Information gathered from all states involved in this grant project show that the 2007 wholesale value of berry crops in the northeast region is valued at $314,558,000. This figure is probably still lower than the real value because most berry crops are actually sold to the retail market where prices are significantly higher than wholesale.[1]

According to a 2002 Census of Agriculture, the northeast region has nearly 169,000 farms. Many of these farms are located in metropolitan counties as noted in a policy brief on population settlement funded by USDA.[2] 17% of these farms are specialty crop farms, of which 66% are fruit farms located in metropolitan counties. It is exceptionally important for these growers to be getting factual, effective Integrated Pest Management information so that they minimize their impact on the environment and maximize their productivity. These farms exist on the urban edge, and as such draw disproportional attention to agricultural practices that may be questioned by the general public. It is important to have northeast farmers well versed in research-based IPM techniques.

Secondly, how can berry farmers be trained in an age of shrinking and dispersed resources? We will evaluate the utility, acceptance and effectiveness of using web conferencing technology to present a series of scientific topics dealing with subjects prioritized by leaders in the northeast berry industry. This technology can draw on experts located anywhere in the world and provide real-time teaching and interaction with a target audience without the need to travel to a distant location.

Background: In 2006 the New York Farm Viability Institute with cooperation from the NY Berry Growers Association identified specific barriers to success for the berry industry in New York State. Intermediate-term threats and opportunities to the industry, along with potential production and management system changes that could make a difference to enterprise success, were identified. It is likely that similar barriers are perceived by growers throughout the Northeast.

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[1] 2002 Agricultural Census, http://www.agcensus.usda.gov/ see attachment for breakdown

[2] Bills, N.L., Uva, W. and Cheng, M.L. Policy Brief – Population Settlement and Specialty Crop Production in the Northeastern US. http://www.cissc.calpoly.edu/farmbill/policies.asp?pid=1

The results of this barrier identification were not surprising. Three out of the top 5 barriers were related to pest management including 1) implementation of improved weed control practices 2) planting new berry varieties and 3) adoption of improved pesticide application technology.

The knowledge base, and research and development capacity at Cornell, the Geneva Research Station and other research stations around NY that work to support NY berry growers through improved production practices and technology were recognized to provide the most opportunity for advancement in 5 years for the NY berry industry.

In 2003 the Northeast Fruit IPM Working group listed priorities for work in applied science and extension. From that list we selected those priorities that our project would address. Focus on these priorities would help remove barriers to success as identified by the NYSBGA. These are listed below:

- Education regarding implementation of IPM programs and potential economic benefits.
- Education regarding monitoring techniques, economic thresholds, etc.
- Education regarding use of limited-spectrum insecticides or alternative management strategies such as mating disruption as replacements for broad-spectrum materials and potential secondary effects.
- Promote educational support to independent crop consultants/IPM scouts on relevant IPM issues
- Aiding in the transition to web-based information delivery
- Education for growers to recognize new and/or emerging pests and associated damage.
- Resources for developing educational materials
- Sprayer and irrigation pesticide application resources (evaluations, calibration, best use patterns, etc.)

Very similar priorities were recognized by the NYS IPM Fruit Working Group and the Cornell University Small Fruit Program Work Team[3].

In June 2008 surveys were also sent to Cornell Cooperative Extension educators and to members of the NYS Berry Association asking for them to prioritize production areas of greatest importance to the berry industry. These groups ranked topics in weed management, pest management, variety selection and development, new technologies, and berry crop nutritional management as being the top ranked priorities for extension programming.

Justification: This project will fit the identified needs of the northeast berry industry and it will accomplish it in within the confines of an extremely modest budget. It is a critical time to leverage resources across a regional level since the needs of berry growers are increasing while state resources diminish.

[3] NYS IPM Fruit Program Priorities: http://www.nysipm.cornell.edu/grantspgm/rfp_ag/fruitpri_06.asp

The webcasting project, although focused on exploring a web-based delivery system, also calls for using "host sites" to help eliminate challenges with connectivity that rural growers might face. If half of the exiting 80 connection spaces are filled with host sites that attract 20 people, we will have an audience of 800 berry professionals without including the other 40 connections that might be single individuals. The other advantage is that we can record the audio and digital presentation and post them on the web for many more people to view or review at their convenience.

We believe that the current system for information dissemination is proving inadequate given extension and research staff reduction region wide, the looming problem of high transportation costs and the fact that many growers are employed off the farm, leaving them limited time to attend educational meetings.

Evaluating the web conferencing technology will be important as other commodity groups struggle with these same challenges.

This project fulfills regional IPM goals of reducing the risk to the environment and reducing the risk to human health not only with the type of subject matter to be presented but also in the fact that we are moving towards a more sustainable presentation method.

This project has stakeholder support as suggested by the previously mentioned priorities. The webcast series will focus on Northeast berry growers and pest problems that are unique to our region. This project has collaborators from 8 states including New York, but the information can be accessed by people beyond this region.

Our goal is to hold a series of 12 inter-disciplinary sessions from over a period of one year. Dr. Marvin Pritts, the proposed director of *Using webcast training to advance interdisciplinary approaches to small fruit pest management,* in concert with the collaborators listed, will direct the activities of support staff in the implementation of the webcast series and will also direct the evaluation of the proposed series of lectures. Immediately following the series conclusion we will evaluate adoption of IPM practices and the utility and acceptance of the webcasting format. Berry growers in the northeastern US are a unique and underserved audience that, given the nature of their health conscious, retail consumers, would actively pursue IPM methods that reduce chemical use and improve the economic implications on the farm.

2. Objectives and Anticipated Impacts:

Objective 1 – Using existing data from the berry industry and IPM and fruit research and extension teams we will craft 12 technical programs for berry growers.

The collaborators on this project have already suggested presentation topics that will address identified barriers and fit within our recognized priorities. Some of these include:

- Appropriate non-chemical and chemical weed management strategies
- Efficacy of softer (OMRI-listed and not) pesticides on berry pests
- Detailed presentations on specific insects and diseases for berry crops (e.g., tarnished plant bug in strawberries, blueberry maggot in blueberries, cane blight and other cane diseases in raspberries, etc.) and how to monitor and control using organic control methods
- Resistance management principles and practices for diseases and insects in berry crops
- Sprayer technology and calibration for various types of sprayers used in berry crops
- How pruning practices can play a role in disease management and overall crop performance in berry crops
- Insect and disease management and season extension systems (e.g., high tunnels, row covers, etc.)
- Nutrient management practices that would improve plant vigor and performance and help with pest control
- Nematode-fungus interactions - specifically black root rot in strawberries and how to collect samples for laboratory assessment of nematode populations
- Soil borne insect problems including the white grub complex in strawberry plantings and the appropriate use of imidacloprid to prevent white grub injury
- Addressing root weevils including black vine weevil; monitoring fields for weevil activity and control methods if weevils are present

Anticipated Impacts:

Short and Medium Term Impacts:

- Increase the amount of non-chemical pest control methods used in berry pest management strategies.

- Improve the utilization of existing chemical pest control materials by improving application methods, timing, and “soft-chemical” selection.

- Increase the understanding of resistance management/avoidance principles.

- Increase the utilization of nutrient management tools.

- Reduce chemical pesticide output due to appropriate sprayer calibration and sprayer equipment.

- Improve the detection of soil-borne disease and nematode pest problems due to improved ability to scout and sample for potential problems.

- Improve the understanding of root weevils and their impact on strawberry crops by improving monitoring and assessment skills.

- Increase awareness and understanding of the role that cultural practices play in pest management.

Long Term Impacts:

- Improve the economic outlook for berry crop producers in the northeast.

- Contribute to the best management of pest management materials so that environmental impacts will be negligible.

Due to the nature of the priorities listed, we feel that our impacts will fit the mission of the NE Regional IPM program which include safeguarding human health and the environment, provide economic benefits to berry growers and will improve the rate of implementation of IPM techniques.

For many of these topics we can track economic benefit by evaluating the adoption rate success. We will evaluate the change in amount of scouting done on these high value crops. Change in use of more organic or "soft" materials and practices when growers attempt to control pests can be evaluated to estimate the impact on human health and the environment. We will measure the # of acres involved in the adoption of IPM practices.

Objective #2 – Evaluate the utility and acceptance of berry growers and other industry professionals with using webcasting technology for educational programming.

Anticipated Impact – Based from feedback from a series of lectures for Cornell Cooperative Extension educators delivered in fall 2008 (http://www.fruit.cornell.edu/berries/webinar.htm), educational programming delivered using webcasting technology receives high marks. We hope to show that after a brief feeling of discomfort, both speakers and participants will find webcasting to be user friendly and appropriate to the subject matter being addressed.

We feel that this delivery method itself is a more economically and environmentally sustainable approach to agricultural extension based programming. We will measure acceptance of the technology with first time users, with 3-4 time users and with individuals who may attend all 12 classes. We expect participants to become more accepting of the technology with increased exposure.

Short Term Impact:

- Have more researchers feel comfortable and capable with using web conferencing software in educational forums.
- Improve awareness of growers to a new information delivery system.

Medium term Impact:

- Help growers use web conferencing as an active part of their continuing education program

Long Term Impact:

- Contribute to a more sustainable approach to delivering research based information to growers, industry professionals and other researchers by utilizing the existing pool of talent in the Northeast in an innovative manner.

3. **Approaches and Procedures:** The following outline of our expected approach to this grant will be led by Dr. Marvin Pritts, the Project Director of the proposed project *Using webcast training to advance interdisciplinary approaches to small fruit pest management.* Dr. Pritts, in concert with the collaborators listed, will direct the activities of support staff in the implementation of the webcast series and will also direct the evaluation of the proposed series of lectures. The chart below describes the tasks more specifically with projected completion dates.

Objective	Phase	Task	Complete by:
Construct 12 IPM webcast programs	Planning	Construct schedule of topics and speakers for Webcast program using input from collaborators	May 2009
	Planning	Attend Training for Adobe Connect Pro	June 2009
	Implementation	Train presenters in use of webcast program and presentation style	Sept. 2009
	Implementation	Organize publicity and information about program and disperse to collaborators	February 2010
	Implementation	Coordinate "live" meeting sites (ie. program devt., technology requirements etc)	February 2010
	Implementation	Coordinate pre and post broadcast queries	February 2010

	re: subject matter and technology	
Evaluation	Coordinate participant evaluation (see plan)	April 2010
Reporting	Report on adoption of IPM technologies	Dec. 2010
Reporting	Report on acceptance and utility of webcast program in delivering IPM information	Dec. 2010

4. Evaluation Plans – One aspect of the Adobe Connect Pro software that we will be able to use for evaluation purposes is real-time polling. We can ask questions that evaluate current practices and then get immediate feedback following the seminar. We will also have access to email addresses of participants that have identified themselves as being innovators and highly motivated merely by logging on to this type of seminar.

Evaluation Objective	Task	Complete by:
Determine adoption rate of IPM strategies presented in seminars	Using polling tool in webcast, we can determine pre-seminar level of adoption. Post seminar adoption level can be determined using email surveys	Sept. 2010
Determine # of acres impacted by IPM strategy	Same technique above	Sept. 2010
Determine present pest control techniques and changes in those practices	Same as above	Sept. 2010
Determine most prevalent attitude regarding control of specific pest problems	Same as above	Sept. 2010
Evaluate utility of webcasting as information delivery method	Track participation numbers	March 2010
Evaluate effectiveness of Webcasting as it relates to IPM adoption	Poll participants and presenters	March 2010

5. Key Personnel

Project Director:
Dr. Marvin Pritts, Small Fruit Specialist, Dept of Horticulture Chair, Cornell University

Dr. Marvin Pritts, the proposed director of *Using webcast training to advance interdisciplinary approaches to small fruit pest management,* in concert with the collaborators listed below, will direct the activities of support staff in the implementation of the webcast series and will also direct the evaluation of the proposed series of lectures.

Other Personnel - Staff directly involved with implementing project:
Laura McDermott, Extension Support Specialist, Eastern NY, Cornell University
Cathy Heidenreich, Extension Support Specialist, Western NY, Cornell University

Regional Collaborators:

Dr. Richard Cowles
The Connecticut Ag Expt. Station

Dr. Joseph Fiola
University of Maryland

Dr. Becky Grube
University of New Hampshire

Dr. David Handley
University of Maine

Dr. Lewis Jett
West Virginia University

Dr. Gary Pavlis
Rutgers University

Dr. Elsa Sanchez
Pennsylvania State University

Sonia Schloemann
University of Massachusetts

RIPM Relevancy Rating Sheet

Name of PD and major cooperators:
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Project Title - Using webcast training to advance interdisciplinary approaches to small fruit pest management

Project Type – Extension

Project Summary - This project, entitled **"**Using webcast training to advance interdisciplinary approaches to small fruit pest management" is an agricultural IPM extension project with two main objectives.

The first objective is to provide interdisciplinary education in pest management to northeastern US berry crop growers. Pest management topics identified by grower groups, IPM advisory teams and project collaborators will be prioritized. Small fruit pests that may be addressed will be those posing the greatest challenge to northeastern growers, and those pests that have been the focus of recent research projects. Topics

chosen will be presented by the regional expert who will also address ongoing research efforts.

Berry crops including strawberries, blueberries, bramble fruits, cranberries, currants, gooseberries, and other minor fruits may be addressed. The emphasis will be on berry crops of greatest economic importance or crops that show the most potential for growth in the northeast region. Berry crops have been chosen because they are a high value crop – estimated wholesale value for the 2007 northeast berry crop is $308,358,000. Continued competitiveness of specialty crop production is a key issue in maintaining viable agriculture in rapidly urbanizing areas of the northeastern US.

The second objective is to explore the utility of webcasting technology. We will investigate if interactive, "real-time" web seminars will be accepted by growers as a valuable and effective approach to grower education. We will also evaluate if this technology allows agricultural researchers and extension faculty greater ability to utilize diminishing extension budgets. Results of the evaluation of our second objective will be shared with researchers in other commodity groups.

Live webcasts will be aired 2x daily, in the afternoon and evening. This will allow participation from a wider audience. Host site participation will be encouraged. This will help alleviate the problem of poor connectivity in rural areas and also provide existing agricultural extension programs the opportunity to provide programming directly to their stakeholders. These sites may choose to enhance the webcast with live instructors and this approach would be encouraged and assisted by project staff.

Description of Problem: This project proposal addresses two primary problems. 1) a need to improve the level of awareness, understanding and adoption of pest management techniques by berry growers and 2) accomplishing the first objective in an age of dramatic reduction of extension staff, shrinking budgets and with expertise scattered across states within regions.

Date of completion: Active project will be completed by March 2010. Evaluation and reporting will be completed by December 2010.

Project objectives and outcomes

Objective 1: Using existing data from the berry industry and IPM and fruit research and extension teams we will craft 12 technical programs for berry growers.

Outcomes:

Short and Medium Term Impacts:

- Increase the amount of non-chemical pest control methods used in berry pest management strategies.

- Improve the utilization of existing chemical pest control materials by improving application methods, timing, and "soft-chemical" selection.

- Increase the understanding of resistance management/avoidance principles.

- Increase the utilization of nutrient management tools.

- Reduce chemical pesticide output due to appropriate sprayer calibration and sprayer equipment.

- Improve the detection of soil-borne disease and nematode pest problems due to improved ability to scout and sample for potential problems.

- Improve the understanding of root weevils and their impact on strawberry crops by improving monitoring and assessment skills.

- Increase awareness and understanding of the role that cultural practices play in pest management.

Long Term Impacts:

- Improve the Economic outlook for berry crop producers in the northeast.

- Contribute to the best management of pest management materials so that environmental impacts will be negligible.

Objective 2 – Evaluate the utility and acceptance of berry growers and other industry professionals with using webcasting technology for educational programming.

Anticipated Outcomes

Short Term Impact:

- Have involved researchers feel comfortable and capable using web conferencing software in educational forums.
- Improve awareness of growers to a new information delivery system.

Medium term Impact:

- Help growers use web conferencing as an active part of their continuing education program

Long Term Impact:

- Contribute to a more sustainable approach to delivering research based information to growers, industry professionals and other researchers by utilizing the existing pool of talent in the northeast in an innovative manner.