Northeastern IPM Program Partnership Grant – Regional IPM Publications - Proposal

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Title: Development of a Pest Identification and IPM Manual for Christmas Tree Growers and Conifer Producers in New York and New England

Project Description:

a. Problem, Background and Justification:

According to the 2002 Agricultural Census, the six New England States plus New York State produced over a million and a quarter Christmas trees on approximately 3500 farms covering over 535,000 acres. In New York alone, there were 52 producers of container or 'balled and burlapped' coniferous evergreens with more than $100,000 in sales (USDA Nursery Crops 2003 Summary).

Conifer producers in the Northeast can face serious pest management issues despite the shorter growing season. Insect pests and diseases that specifically attack conifer species may build up quickly and require immediate or frequent treatment to maintain the growth of trees and protect the quality of the crop. Heavy weed infestations can rapidly reduce growth rates and the ability to manage weeds effectively, both in and between rows of conifers, and have been identified as a major concern for conifer producers. Several pests introduced from other regions of the country (e.g. Rhabdocline needle cast) or overseas (e.g. Sirex wood wasp) pose threats to conifer production in this region. Both Christmas tree growers and nursery producers may grow a variety of conifer species in a relatively small area, which can exacerbate both pest problems and control.

Limited information is currently available to producers regarding long-term management strategies for pest control. USDA/Michigan State publishes a Christmas Tree Pest Manual with good photographs and descriptions for identification but it does not include information on weed control. The Cooperative Extension Services of the region publish a variety of materials that address pest control in Christmas trees, such as The Southern New England Christmas Tree Manual (Massachusetts), the 2006 Guide to Chemical Weed and Brush Control in Christmas Trees (New Hampshire), the Connecticut –Rhode Island Christmas Tree Growers Manual, and the Massachusetts Christmas Tree Growers' Handbook. However, no recent comprehensive manual on pest control that includes integrated pest management (IPM) exists for Northeastern conifer and Christmas tree producers. Producers have expressed a need for a pest management manual for conifers that is up to date, specific to production sites in the Northeast, and offers user-friendly descriptions of both cultural and chemical management strategies for key pests including weeds, insects, and pathogens. In addition to producer requests, there are several relevant priority statements issued by regional IPM organizations:

- The Northeast Research, Extension, and Academic Program Committee for IPM identified "IPM strategies and tactics for ornamental crops including Christmas trees" as an area of emphasis in 2006.

- One of the General IPM Priorities for the Northeast listed by the Northeastern IPM Center (NE-IPM) in 2005 was "Provide research for and outreach on alternative control technology for nursery pests including insects, diseases, weeds, vertebrate and soil pests."

- In 2002, the Greenhouse and Ornamental Working Group of NE-IPM strongly recommended the "Development and distribution of IPM resources / tools for end users", particularly those that "can be used as is or as templates and shared throughout the region"

Therefore, we propose to develop a comprehensive pest management guide for Northeastern conifer producers, which is user-friendly and presents pictorial and text descriptions of key conifer disease, insect and weed pests with an emphasis on integrated methods of control. Our intent is that the manual will provide a tool for scouting and making pest-management decisions. By emphasizing the integrated aspects of production and pest management, and encouraging early pest identification and scouting, we wish to encourage the development and utilization of effective and environmentally sound management practices for production of conifers and Christmas trees.

The intended audience consists of a variety of stakeholders. Small and large-scale producers of cut or select-and-cut Christmas trees, and of 'balled and burlapped' or container- grown conifers as nursery stock in the Northeast and Cooperative Extension personnel are of primary interest. The manual may also be useful for landscape managers and retailers as well as growers in other regions of the country with similar pest problems and conifer species. The desired long-term benefits include reduced loss of trees to pest-inflicted damage, reduced time to maturation, and improved quality of trees, resulting in increased income to producers. Possible associated benefits could include reduced use and cost of pesticides as well as the time/inconvenience required to apply them.

b. Objectives and Anticipated Impacts

Objectives:

A. Develop a manual for growers of Christmas trees and nursery conifers that:

1. Fills the existing and stated need for accurate, up-to-date and easy-to-use pest management information, including that for weed pests, relevant to Christmas tree production

2. Enables growers to enhance the use of IPM in their production systems by means of:
    a. Accurate identification of pests through photographs and description of damage
    b. Management techniques that emphasize scouting, management of pest infestations, and IPM strategies

3. Has regional utility through cooperation of specialists in New York and the New England states

B. Evaluate stakeholder response to the manual throughout the specified region

Potential impacts:

1. Fills an existing and stated need
   - The majority of the stakeholders who evaluate the manual will be:
     - satisfied with the manual as a pest management tool
     - would be willing to pay for the manual
   - The web-based version will generate increased traffic on the NYS –IPM website.

2. Has the potential to enhance use of IPM in Christmas tree and conifer nursery production
   - The majority of the stakeholders who evaluate the manual will use it to assist them in implementing IPM control tactics, such as accurate pest identification and scouting in their fields.
   - Cooperators in each state will use the manual as an IPM tool in educational events for Christmas tree and conifer nursery producers

3. Has regional utility and enhances multi-directional flow of information.
   - In each participating state, cooperators will involve stakeholders in informal discussion and organized educational activities to introduce and evaluate the manual.

While the ultimate anticipated impact of the manual is an increase in adoption of IPM measures in Christmas tree and nursery conifer production, with resultant economic and environmental benefits, the accurate measurement of that change is beyond the scope of this project. However, stakeholders throughout the region could be queried on their implementation of IPM and how it benefited them after the manual has been released, with specific questions on reduction in pesticide use, reduction in pesticide exposure, improvement in tree quality and increased yield.

An additional intended benefit of this project is an increase in inter-state cooperation. Again, that is difficult to measure within the stated impacts, but it is hoped that if this interaction is successful, it will lead to others.

c. Approach and Procedures

Objective A. Develop a manual for growers of Christmas trees and nursery conifers.

1. Evaluate existing materials for use in the manual and create draft manual

   The IPM Manual for Christmas Trees and Nursery Conifers will be based on an IPM Manual for Christmas Trees developed in 2006 by Ms. Stephanie Mallozzi for the growers in Southeastern New York State. This manual includes photographic and text descriptions of the disease and insect pests commonly found on the species produced in that region, with scouting/management information for each. Weed management information is available in materials prepared for a website on Alternative Strategies for

Weed Management created by Dr. Leslie Weston. The weed section will include descriptive text and pictures to aid identification, as well as management strategies.

In addition to accurate pest identification, the manual will focus on long-term IPM strategies for effective prevention and management of pest infestations. It will include well-organized sections on cultural control practices, as well as biological control strategies that work in conifers. It will also describe chemical control options from a general perspective and suggest sources for the most current information on application of these pesticides for conifer pest management in each state in the Northeast region.

Additional supporting chapters will be written as needed to create a draft manual. These may include such issues as seedling bed preparation and layout, cover crop establishment for weed suppression and encouragement of beneficial insects, nutrient management and irrigation, pruning and shearing practices that influence pest infestation, soil compaction, management of surrounding areas, cultivar and species selection as it relates to insect and disease control, and implementation of biological control strategies for key conifer pests.

2. Identify required modifications for New York State growers, and add necessary text and photographs

Additional information may be necessary to include all the tree species, insects and diseases commonly found in New York State production sites. Cornell staff will identify gaps in information, with the assistance of New York State conifer producers and Extension staff. The project directors and the student assistant will compile the required text and photographs to fill in these gaps.

3. Cooperators evaluate manual and identify modifications

Specialists in Entomology, Plant Pathology and Weed Science from Connecticut, Maine, Massachusetts, New Hampshire and Vermont have agreed to evaluate the draft manual. They will review the manual both for the accuracy of the technical information and for its relevance to growers in their states. Cooperators may involve stakeholders and other interested parties from their states in this evaluation as they see fit.

4. Insert necessary text and photographs

Project directors, with the assistance of regional cooperators, will write/find and include any text or photographs necessary to make the manual relevant, current, and easy to use for the growers throughout New York and New England.

5. Print and distribute to cooperators in region

The manual will be professionally printed on glossy stock, to enhance the appearance of the photographs, in an 8.5 x 11 spiral bound format. The intent is that the manual be useful as a tool in the field as well as for making good management decisions. Fifty to 100 copies of the manual will be sent to each cooperator for use in educational events or for other methods of stakeholder evaluation.

The intent is that the manual will be a for-sale publication in the future, in order to

generate funds for reprinting and distribution. Also, an html format of the manual will be available on the NYS IPM website to reach a wider audience and to increase interest in sales of the hard copy.

Objective B. Evaluate stakeholder response throughout region

1. Hold educational activities or use existing meetings to introduce the manual and gather feedback

Project directors and cooperators will gather feedback from stakeholders on their interest in, and evaluation of, the manual in a variety of ways. Because personnel have different job responsibilities in their states, the methods used may vary. Cooperators may create specific educational activities to introduce the manual or combine gathering feedback with existing activities where interested stakeholders would be present. In New York State, for example, project directors will attend area Christmas tree workshops, the Summer Convention of the Christmas Tree Farmers Association of New York, Inc. and the Empire State Green Industries Show to provide growers with copies of the manual and to solicit their feedback. Less formal interactions are possible with growers involved in research projects or on advisory boards, etc.

2. Evaluate success of project and compile reports

While evaluation of the progress of the project will be ongoing throughout the grant period, it is anticipated that the majority of the stakeholder evaluation information will only be available toward the end of the project period. Project directors will compile results from New York State and those provided by the cooperators in order to determine the success of the manual as a resource.

Table 1. Timetable for completion of tasks associated with production of IPM Manual for Christmas Tree and Nursery Conifers

Objective	Task	Responsible	Completed by (assuming April 1, 2007 start date)
A. Develop a manual for Christmas tree and nursery conifer producers			
	1. Evaluate existing materials for use in manual and create draft manual	Project directors and student	June 1, 2007
	2. Identify required modifications for New York State growers, and add necessary text and photographs	Project directors and student	August 1, 2007
	3. Cooperators evaluate manual and identify modifications	Cooperators	September 1, 2007
	4. Insert necessary text and photographs	Cooperators and project directors	October 1, 2007
	5. Print and distribute to cooperators in region	Project directors	December 1, 2007
B. Evaluate stakeholder response throughout region			
	1. Hold educational activities or use existing meetings to introduce manual and gather feedback in all relevant states	Cooperators and project directors	March 1, 2008
	2. Evaluate success of project and compile reports	Project directors	March 31, 2008

d. Evaluation Plans

The completion of Objective A will be fairly easy to verify and is the basis for completing Objective B, so the majority of effort on verification will be on determining whether accurate and sufficient stakeholder information has been gathered and whether the potential impacts have been realized.

There will be 3 primary methods of gathering information on grower response to the IPM Manual for Christmas Trees and Nursery Conifers: direct interaction of project directors/cooperators with stakeholders, a questionnaire included in the manual and web traffic generated by the html version.

To assess the usefulness of the manual to the end-user, we will incorporate a questionnaire into the manual. The questionnaire will be a detachable page at the front of the manual, and will include questions regarding the layout of the manual, the usefulness of the information, and specific changes the user would like to see (additional pests, type of information, etc.). Stakeholders will be encouraged to send in the questionnaire to provide a mailing address for any updates to the manual (on a separate sheet to maintain confidentiality of responses). This method of gathering information may be more important once the manual is a for-sale publication but could provide information from stakeholders not involved in direct interaction.

Web traffic information, measured as number of 'hits', can be generated from the NYS IPM website. This is a fairly indirect method of evaluating interest, but increased web traffic over time could indicate an increase in demand for, or use of, the manual.

Direct interaction is much more likely to provide the necessary information to assess impact. Therefore, the majority of effort will be placed on face-to-face gathering of data. As mentioned before, the number and type of interactions may vary by state, but project directors and cooperators will make the effort to reach as many stakeholders, producers and Extension personnel as possible. Potential venues include grower workshops, state or regional grower organization's annual meetings, trade shows, in-service training, etc.

<u>Verification of stated potential impacts</u>
1. Fills an existing and stated need

Project directors and cooperators will create a list of questions that all will use to determine if stakeholders are satisfied with the manual as a pest management tool and would be willing to pay for the manual. This list of questions can be included in the educational activities that occur in each state and/or in more informal discussions with growers. Cooperators could adapt the questions to their situations, but using a somewhat standardized list would ease reporting results.

2. Has the potential to enhance use of IPM in Christmas tree and conifer nursery production

While actual increase in implementation of IPM methods cannot be evaluated, growers could be questioned on the likelihood of their using the manual to assist them in pest identification and

scouting, and whether it provides useful information on pest control methods they had not previously considered using.

Another method of determining whether the manual could enhance the use of IPM is to ask Cooperative Extension personnel whether they consider it a useful tool for their educational activities.

3. Has regional utility and enhances multi-directional flow of information.

Regional utility should have been built in to the manual by the time it is being evaluated by stakeholders, except perhaps for those growers involved in evaluating the draft versions. Using direct interaction as a primary means of gathering data enhances the potential for generating discussion, rather than the static answering of questions. Often discussion will bring to light aspects of an issue that the authors had not considered. Ease of use is an intended characteristic of this manual, and a multi-directional flow of information may be the best way to determine what stakeholders consider appropriate.

Cooperation and Institutional Units Involved

Cornell University:

Dr. Elizabeth M. Lamb, New York Integrated Pest Management Program
Dr. Leslie A. Weston, Department of Horticultural Sciences
Dr. Paul A. Weston, Department of Entomology

The co-project directors (see Key Personnel section for CV's) will compile the manual, adding information on weeds (not in current Christmas Tree IPM manual), and updating the disease and insect control sections to make the manual relevant to all regions of New York State. They will use the amendments and materials provided by the cooperators to create the final document. They will also gather stakeholder information through educational activities, such as regional Christmas Tree Workshops, the annual meetings of the Christmas Tree Farmers Association of New York, Inc. and the Empire State Green Industry Show.

Ms. Stephanie Mallozzi, Extension Educator, Duchess County, New York

Ms. Mallozzi will assist in updating the information to include tree species and pests found throughout New York.

Connecticut Agricultural Experiment Station, Dr. Todd Mervosh, Weed Scientist
Maine Forest Service, Dr. Bill Ostrofsky, Plant Pathologist
University of Massachusetts, Dr. Robert Wick, Plant Pathologist
University of New Hampshire, Dr. Stan Swier, Entomologist
University of Vermont, Dr. Margaret Skinner, Entomologist

The cooperators at the institutions listed were chosen to represent the disciplines covered by the manual (Entomology, Plant Pathology and Weed Science) in order to provide a panel of experts to evaluate the information in the manual. They were also chosen to represent the primary Christmas tree producing states of New England. They will evaluate the draft manual for its application to the producers in their states and assist in updating the manual to include text and pictures necessary to this applicability. They will also interact with stakeholders to ensure that the manual fills the stated need and to determine the impacts of the project.

Key Personnel

Project Director – Elizabeth M. Lamb

Dr. Lamb is responsible for coordinating development of the draft manual, managing the student assistant, interacting with cooperators to complete the manual, coordinating printing of the manual, coordinating collection of stakeholder information from New York and New England, and coordinating preparation of reports.

Co-Project Director – Leslie A. Weston

Dr. L. Weston is responsible for providing weed management information for the draft manual, cooperating on the draft manual as a whole, and assisting with collection of stakeholder information.

Co-Project Director – Paul A. Weston

Dr. P. Weston is responsible for evaluating insect pest and management information, cooperating on the development of the internet-based version, cooperating on the draft manual as a whole, and assisting with collection of stakeholder information.