Greenhouse and Nursery IPM Research and Extension Priorities in the Northeast

Consolidated by GO IPM

Developed September 2002

Greenhouse and Ornamental IPM (GO IPM) Commodity Working Group

The Greenhouse and Ornamental IPM (GO IPM) Commodity Working Group is a network of stakeholders interested in Integrated Pest Management for the greenhouse and nursery ornamentals industries in the Northeast. In September 2000, the USDA funded the creation of the Northeastern Pest Management Center (NE PMC) as part of a nationwide pest management information network. The network serves two major purposes: to facilitate communication among key groups of people, and to provide these groups with broad access to pest management information (for more information on the NE PMC go to http://nepmc.org). The GO IPM Commodity Working Group was established to facilitate the NE PMC.

Mission of GO IPM

GO IPM is a partnership between growers and other green industry stakeholders to develop and support greater adoption of innovative, environmentally sound and economical management tactics for plant production in the greenhouse, nursery and allied industries. We strive to provide a forum for identifying the needs and priorities for this agricultural sector that will encourage IPM implementation. Our hope is that by establishing IPM priorities; federal, state, university and private organizations will be better able to meet the critical pest management needs of growers. We will serve as a catalyst for bringing together green industry professionals [1] , Cooperative Extension and University faculty, and government officials on a regional scale to address key IPM issues.

Participants

The participants of GO IPM represent stakeholders region-wide, including greenhouse and nursery growers, extension specialists, researchers (entomologists, plant pathologists, biological control specialists, production specialists), commercial biological control suppliers, Northeast Plant Board, state agriculture department personnel, and environmental-oriented organizations. An effort was made to involve a broad cross-section of specialists and interested persons from all of the states in the region, and membership in the group will evolve over time to respond to changes in the industry.

Challenges to Implementing IPM

Before starting the process of establishing industry priorities, GO IPM felt it was important to identify what barriers hinder adoption of IPM. These are more general issues that will be addressed specifically by the priorities.

- Lack of knowledge of growers on implementing IPM
- Lack of "trust" by growers that IPM and alternative/biological control methods work
- Grower reluctance to change pest management practices
- Lack of adequate science based information (see research priorities listed below) for Extension staff to make pest management recommendations
- Encouraging the pesticide industry to serve as an educational force for IPM
- Developing IPM strategies that deal with multiple pests on multiple crops
- Serving the needs of diverse growers (e.g. different sizes of operations, crop types, climates, etc.)
- Promoting "resistance management" when products become available that are "silver bullets"
- Lack of federal and state funding for research and extension efforts
- Lack of university research and extension personnel (e.g. retirements in ornamental IPM not being replaced, limited resources, inflexible administrative systems)

Priorities

The members of GO IPM first met in June 2002 to initiate the process of identifying research and extension priorities and key pests that should be addressed to expand IPM implementation in our region. Below is a summary of these priorities presented as research related and extension related. Please note there is no ranking of the priorities. We recognize that these priorities may change as new issues arise and more information is received. The summary will be updated annually based on discussions among GO IPM members and feedback from other green industry stakeholders as well as surveys from growers and others involved in this agricultural sector. Anyone interested in completing a survey should contact one of the GO IPM co-leaders:

Margaret Skinner: mskinner@zoo.uvm.edu Tel: 802-656-5440

Paula Shrewsbury: ps161@umail.umd.edu Tel: 301-405-7664

RESEARCH PRIORITIES:

- Evaluate pest / natural enemy / host plant population dynamics and factors that influence these dynamics
    - Identify methods to improve efficacy and cost effectiveness of biological control
    - Identify which natural enemies are best for suppressing specific pests
    - Determine key biological information on pest and natural enemy life histories
    - Determine optimal natural enemy release rates, timing, and methods for greenhouse and nursery environments

- Develop alternative, less toxic pest management tactics, including biological and cultural methods for key weed, disease, and insect pests
    - Evaluate efficacy and cost effectiveness
    - Develop practical, user friendly methods of implementation
- Focus advances made in biotechnology for traditional agricultural crops on development of insect/disease resistance in ornamental plants
- Develop innovative Total Plant Management (TPM) or Best Management Practices (BMP) that emphasize IPM to prevent or suppress pest outbreaks
    - Evaluate the influence of plant health / stress and production practices (e.g. fertilization, irrigation, potting media type) on pest outbreaks / population dynamics
    - Develop and evaluate plant management practices that enhance the effectiveness of natural enemies, specifically related to conservation and augmentative biological control
- Develop effective and easy to use application technologies for biological and chemical control

  Increase knowledge of and applicability of damage / action thresholds

  Develop improved scouting methods and diagnostic tools

  Develop improved methods for detecting low pest populations, as they relate to international trade, exotic pests, and native pests, to prevent their introduction and spread

  Develop strategies for managing new and emerging pests

    - Identify effective controls
    - Obtain labeling of pesticides for emerging pests

EXTENSION PRIORITIES:

- Develop definitions and methods to quantify costs and benefits of IPM as they relate to:
    - Economics
    - Environmental factors
    - Biological control methods
    - Phytotoxicity
    - Risks and benefits to applicators / staff (e.g. LD_{50}'s, REI's)
- Establish effective means of communication between green industry professionals, Cooperative Extension and University faculty, and government officials
    - Develop a "process" for feedback and input **from** growers / green industry professionals
    - Develop a "process" for response and evaluation **to** growers / green industry professionals
        - Establish focus groups
        - Establish grower advisory groups

        - Identify extension / research person for growers to communicate with for each state for greenhouse and/or nursery-related IPM issues
        - Establish grower list serves (nursery and greenhouse)
- Demonstrate full scale IPM Program implementation in greenhouses and production nurseries
    - Feasibility (efficacy, cost effectiveness, ease of use)
    - Integration of IPM tactics, especially biological methods, into ongoing pest management programs
- Educate green industry professionals on implementation of IPM
    - Develop straightforward, hands on training modules or protocols on various aspects of IPM (e.g. key pest identification and biology's, monitoring/scouting, current management strategies, application technologies)
        - Modules and protocols can be used as templates and shared throughout the region
        - Develop 1 day and multi day educational programs
    - Use/exploit successful demonstration IPM programs in training/educational activities
    - Emphasize benefits and need for IPM implementation and develop strategies that are suitable for individual growers
    - Train and produce students with expertise in IPM implementation
- Development and distribution of IPM resources / tools for end users
    - Resources can be used as is or as templates and shared throughout the region
    - Resources such as IPM guidelines, fact sheets, web sites, timely IPM updates (emails, web, fax), etc. that provide information on pest biology's, information on degree day and plant phenological indicators to predict pest activity, which beneficials to use for various pests and how to evaluate their effectiveness, which pesticides have reduced impact on beneficials, environment, and human safety, resistance management, etc.
- Create a directory of information resources (and where to get them) related to greenhouse and nursery IPM (IPM guidelines, fact sheets, web sites) that remains current and is readily accessible

  Create a directory of key people (research, extension, government agencies/officials, professional associations) that remains current and is readily accessible

  Consumer education on IPM relating to what IPM is, benefits of IPM, changes in tolerance to plant damage, and what they should be demanding from nursery (e.g. resistant plant species, low input plant species, plants that attract beneficials)

    - Garden center programs
    - Marketing programs for "sustainable" plants and landscapes
    - Demonstration gardens
    - IPM curricula in public school systems (K-12)

KEY PEST and CROP MANAGEMENT PROBLEMS [1]

Diseases	Nursery	Greenhouse
Anthracnoses	*[2]	
Bacterial leaf spots or cankers	*	*
Botrytis blight		*
Canker diseases	*	
Crown gall	*	
Damping off		*
Downy mildews		*
Fungal leaf spots	*	*
Fusarium wilt		*
Phytophthora root, stem or crown rots	*	
Powdery mildew	*	*
Pythium root, stem or crown rots		*
Rhizoctonia root, stem rot or blight		*
Rust diseases	*	
TSWV and/or INSV (thrips-vectored viruses)		*
Verticillium wilt	*	
Insects	**Nursery**	**Greenhouse**
Aphids	*	*
Black vine weevil	*	
Cyclamen and/or broad mites		*
Fungus gnats and/or shore flies		*
Gall forming insects and/or mites	*	*
Lace bugs	*	*
Leaf feeding beetles	*	
Leaf feeding caterpillars and sawflies	*	
Leafhoppers	*	
Leafminers	*	
Mealybugs		*
Scales and adelgids	*	*
Spider mites and other mites	*	*
Thrips		*
White grubs	*	
Whiteflies		*
Wood/stem borers	*	
Crop Management	**Nursery**	**Greenhouse**

Problems		
Weeds	*	*
Algae and/or moss		*
Environmental control (heating and/or cooling)		*
Fertility and fertilization (pH, EC, etc.)	*	*
Irrigation and/or watering	*	*
Potting media (quality, drainage, etc.)	*	*
Rodents	*	*
Slugs	*	
Waste water treatment/disposal	*	*
Weather (frost, heat, drought, etc.)	*	

[1] Based on results of a survey that is currently underway, the pests, diseases and production problems that plague the greenhouse and nursery industry will be updated and ranked according to their severity.

[2] Indicates if the pest or problem occurs more commonly in nursery, greenhouse, or both cropping systems.

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[1] Green industry professionals include nursery and greenhouse growers, suppliers, distributors, policy makers, and other allied industries.