

Title:

Creating an IPM Resource for Growers Producing Vegetable Transplants and Food Crops in Protected Culture.

Project Leaders:

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Abstract:

Despite significant production in New York State of both vegetable transplants and edible crops in greenhouses and high tunnels, there are limited resources describing integrated pest management (IPM) strategies available for edible crops in protected culture. This project is in the process of creating an IPM resource to assist extension resource educators and stakeholders. This resource will provide concise information on cultural management and sanitation practices, biological control options, and conventional and organic pesticides for disease, insect, and weed pests of edible plants and transplants grown in greenhouses and high tunnels.

Background and Justification:

Greenhouse production of vegetable transplants for home gardens and field production is a growing sector of greenhouse production. In NYS, the wholesale value of greenhouse-produced vegetable flats and pots for home gardens was valued at 5.88 million in 2010, and has increased 31% over the past 5 years (USDA NASS Floriculture Crops Summary). Additionally, production of edible crops in protected culture – greenhouses and high tunnels – is also rapidly expanding. The total value of edible crops grown in greenhouses in NYS was \$14.6 million in 2009, and the production has increased 650% from 1998-2009 (USDA NASS Census of Horticultural Specialties).

Despite the significant production of vegetable plants and food crops in protected culture in NYS, a concise guide to integrated pest management (IPM) for this production system is currently not available. There are various resources detailing integrated pest management strategies available for growers of flowering crops in the greenhouse and for vegetable crops grown in the field, such as the Cornell Guide for the Integrated Management of Greenhouse

Floral Crops and Cornell Integrated Crop and Pest Management Guidelines for Commercial Vegetable Production. However, there are limited resources available to growers growing vegetable transplants or food crops in protected culture.

A document detailing IPM strategies for vegetable transplants and food crops is a necessary resource for both stakeholders and resource educators. To be most helpful, this resource should include information on cultural management and sanitation practices, and biological control options, as well as a list of appropriately labeled pesticides for use on transplants and food crops in protected culture. Additionally, since numerous growers are interested in using organic practices for pest management or are certified organic producers, this resource should also list which products are listed by the Organic Materials Review Institute (OMRI).

Growers often have a difficult time quickly identifying which products are labeled for disease, insect and weed management for vegetables for transplants or food crops in greenhouses. Most often, labels need to be very carefully read to identify if the pesticide can be used in a greenhouse or on a food crop, or if there are applicable pre-harvest restrictions. This can be time consuming and confusing and often leads to an application of a product that is not appropriately labeled for use in greenhouses or on the crops to be treated. In some cases a pesticide that is labeled for greenhouse use, but not for a food crop will be applied, and in other cases a pesticide that is not labeled for use in a greenhouse will be applied. A concise reference guide would help educators and stakeholders quickly identify what cultural, biological, and both organic and conventional pesticide management options are available and better ensure that appropriate management strategies are used.

The cultural management strategies detailed in this proposed IPM resource will help accomplish several of the Vegetable Crop IPM Priorities: promoting the adoption of biological controls in high tunnels, promoting the use of disease resistant varieties in high tunnels, promoting the benefits of ventilation for disease management in high tunnels, and promoting the use of between row mulching in high tunnels. Also, this IPM resource will accomplish the Ornamental IPM Priorities of transferring knowledge to stakeholders and creating IPM resources.

Objectives:

1. Develop and distribute an IPM resource for edible crop production in greenhouses and high tunnels. This document will be easily shared via website postings and email distribution, and will be downloadable and printable by growers and resource educators.
 - a. Include information on cultural management of important pests of edible crops in greenhouses and high tunnels.
 - b. Include list of pesticides labeled for use in greenhouses and indicate the crops and pests for which the products are labeled. Also indicate which products are OMRI-listed.
 - c. Include a quick reference table for biological controls available.
2. Work with Mike Helms (Cornell Pesticide Management and Education Program) to incorporate this information into the existing guidelines and to provide a system for annual updating of the information.

Procedures:

- Project leaders and collaborators met via phone conferences and personal meetings and determined that the resource will be a stand-alone Pest Management Guide, *Cornell Pest Management Guide for Greenhouse Vegetables and Herbs Production*, which will be offered in addition to the current series of Pest Management Guidelines.
- The Guide will have three crop sections: 1) vegetable and herbs/spices transplants, 2) herbs/spices production in greenhouses, and 3) vegetable production of the most commonly produced vegetables in greenhouses and high tunnels (cole crops, cucurbits, eggplant, lettuce/endive, peppers, spinach, and tomato).
- For the transplant crop and the herbs/spices sections, general greenhouse cultural management, information on the most common insect and disease pests, and a list of fungicides and insecticides allowed for use on greenhouse transplants of food crops will be presented. Any restricted-use pesticides, OMRI-listed pesticides, and fungicide or insecticide resistance groups are noted.
- For the vegetable crop production section, the most common insect and disease pests for each of the most commonly grown greenhouse- and high tunnel-grown vegetable crops (listed above) are discussed. For each pest issue, management strategies are described including cultural management, resistant varieties, and chemical control. A list of labeled fungicides and insecticides is included, with restricted-use pesticides, OMRI-listed pesticides, and fungicide or insecticide resistance groups noted.
- In addition to the crop sections, supporting information on sanitation, weed management, plant growth regulation, biological control, and pesticide information and safety will be provided.
- Once developed the resource will be distributed and promoted. The resource will be distributed to Cornell staff and Cornell Cooperative Extension educators through the Cornell Program Work Teams and email lists. Stakeholders will be reached through website postings on the NYS IPM website, the Cornell Greenhouse Horticulture website, and others; through various local e-newsletters, and through regional educational programs such as the Empire Expo, and various local greenhouse/floriculture and vegetable crop meetings.
- Project Evaluation – The number of individual contacts reached will be recorded. An online evaluation will be distributed or posted along with the resource. Survey participants of various educational programs (such as the annual bedding plant schools in Western NY, Capital District, Hudson Valley, Long Island) on their need for this information.

Results and Discussion:

Currently, drafts have been completed for disease management and labeled fungicides for cole crops, cucurbits, eggplant, lettuce/endive, peppers, spinach, and tomato production, labeled insecticides for cucumber production, labeled fungicides and insecticides for transplant production, labeled fungicides and insecticides for herbs/spices production, and labeled herbicides. Throughout January and February the remaining sections will be created, and all sections will be finalized with the correct format, and edited.

Once completed, this Guideline will be a resource for the approximately 150 greenhouse growers in NYS producing vegetable plants in pots or flats (USDA NASS May 2012 Floriculture Crop Report), the nearly 100 farms growing food crops in greenhouses (USDA NASS 2009 Census of Agriculture), and the approximately 25 operations growing transplants for commercial vegetable production (USDA NASS 2009 Census of Agriculture). In addition, this resource will provide information to vast majority of the over 3000 vegetable farms in NYS that grow their own transplants.

Project Locations: N/A

Samples of Resources Developed:

Will be provided upon the completion of the Guide.