

VEGETABLE EXTENSION AND RESEARCH IPM PRIORITIES

revised November 2011

(Rank: H=high, M=medium, L=low)

Multiple Crop Priorities: Field Production

Implementation Priorities:

- H Alternative weed management techniques such as interseeding, new cultivation tactics, and banding of herbicides
- H Demonstrate new biological and biocompatible control measures, including practices for organic systems, that look promising in replicated experiments.
- H Demonstrate pest management benefits of improved and calibrated application equipment.
- H Demonstrate the benefits of seed treatments for insect and disease management.
- M Demonstrate to growers how to effectively make use of the previous season's weed population information when planning rotations, tillage and herbicide options for the following season weed control program.
- H Evaluate IPM programs developed in other states. Refine and adapt them for NY.
- H Improve and expand weather-based insect and disease forecasting models.
- H Demonstrate the use of cover crops for disease and weed management.
- H Using more exacting plant fertility measurements, demonstrate improved plant resistance to pests in crops appropriately fertilized and encourage implementation of these tools.
- H Demonstrate effective management practices for plant-parasitic nematodes.

Research Priorities:

- H Use of mulches, including no-till and killed, rotational strategies and other alternative practices for improved soil quality and weed control in vegetable cropping situations.
- H Maximize effectiveness of pesticides through evaluation of application equipment.
- H Develop decision systems for diseases and insect pests that are based on weather data and compatible with the currently owned electronic weather sensors.
- H Preventative measures for disease control such as rotation, cultural practices and avoidance.
- H Optimize pesticide efficacy evaluations by timing treatments based on action thresholds.
- H Management of root rot and nematode diseases.
- H Improve our understanding of which are the most important natural enemies and how insecticides and biotech products may affect them.
- H Evaluate new biological and biocompatible control measures including practices for organic systems.
- H Evaluate new biotech products.
- H Improve flea beetle management tactics, especially for organic systems.
- H Seed treatments to control seed maggots, flea beetles, other insects and diseases
- M Slug biology and management.
- M Influence of environmental factors on the efficacy of aerial sprays for insect control.
- H Breeding to improve insect and disease management.
- H Investigate the use of cover crops for disease and weed management.

Multiple Crop Priorities: High Tunnel/Greenhouse Production

Implementation Priorities:

- H Promote adoption of biological control of thrips and two spotted spider mites in high tunnel crops.

Research Priorities:

- H Improve and refine two spotted spider mite management with biological control in passively heated structures.
- M Improve and refine thrips management with biological control in passively heated structures.

Crucifers (cabbage, cauliflower, broccoli)

Implementation Priorities:

- H Demonstration and evaluation of biological control (including natural enemies and pathogens) and assessment of the effects of presently used insecticides on natural enemies.
- H Black rot management information dissemination

Research Priorities:

- H see multicrop weed management
- H Evaluation of biological control (including natural enemies and pathogens) of Lepidopteran pests, aphids, and maggots - especially for those insects where insecticide resistance is a concern.
- M Development of alternative control tactics for root maggots including use of pathogens, host plant resistance, seed coating and adult trapping.
- H Disease control in storage cabbage
- H Breed for and evaluate varieties for pest (insects and disease) resistance alone or in combination with other bio-based practices.
- H Improve management strategies for thrips in cabbage and work with growers and companies to incorporate such into commercial production.
- M Evaluate swede midge management techniques for organic production
- M Evaluate Alternaria head rot management techniques in organic cauliflower

Cucurbits (Field)

Implementation Priorities:

- H Continue with cucurbit IPM implementation including recommendations for resistant varieties.
- H Assess the extent of powdery mildew resistance to fungicides
- H Demonstrate some documented strategies for Phytophthora blight management
Increase grower awareness and use of downy mildew tracking and forecasting (PIPE)
- H Demonstrate and increase grower awareness of seed treatment technology for striped cucumber beetle management.

Research Priorities:

- H Continue interdisciplinary research on diseases and insect pests including evaluation of resistant varieties and biocompatible pesticides.
- H Develop strategies for managing Phytophthora Blight
- M Determine strategies for control of bacterial diseases (bacterial wilt, leaf spot and angular leaf spot) of cucurbits.
- M Develop striped cucumber beetle management strategies for organic production.
- M Develop downy mildew management strategies for organic production.

Cucurbits (High Tunnel)

Implementation Priorities:

H Promote adoption of powdery mildew resistant cucumber varieties.

Research Priorities:

H Striped cucumber beetle management in high tunnel cucumbers

M Downy mildew management in high tunnels.

M Improve and refine grafting for soil borne disease management

M Powdery mildew management for zucchini and summer squash grown in high tunnels

M Pollinator management in high tunnel cucurbits.

Dry Beans

Implementation Priorities

H Trapping and scouting for western bean cutworm to determine need for control.

Research Priorities

H Investigate biology and management (including action thresholds) for western bean cutworm.

Greens (High Tunnel)

Implementation Priorities:

H Promote adoption of downy mildew and Fusarium resistant spinach varieties.

H Promote adoption of downy mildew resistant lettuce varieties.

H Educate growers on the importance of controlling warm season pests prior to winter greens crops.

H Promote adoption of biological control of cool weather mites that attack winter greens.

Research Priorities:

H Screen for aphid resistant greens varieties.

H Spray options (organic and conventional) for pest control in low temperature settings.

H Investigate the effects of temperature and photoperiod on natural enemies for control of aphids and mites in high tunnel greens.

H Management of cabbage worms on brassica greens.

M Management of rodents (voles and mice) in high tunnel greens and root crops.

Onions and other Alliums

Implementation Priorities:

H Demonstrate benefits of rotations for pest control, e.g. weeds and onion maggot.

H Continuation of implementation projects to increase adoption of IPM techniques including but not limited to the use of the onion thrips threshold and the use of Blight Alert.

H Demonstrate an efficient program for detecting thrips susceptibility to commonly used insecticides.

H Demonstrate management of black rot (*Aspergillus niger*) and neck rot (*Botrytis allii*) from field to storage

- H Demonstrate best management practices for management of garlic bloat nematode, including seed certification

Research Priorities:

- M Investigate biology of black rot (*Aspergillus niger*) and neck rot (*Botrytis allii*) from field to storage
- H Evaluate onion varieties for resistance to onion maggot, Botrytis leaf blight, onion thrips and other pests.
- H Investigate new seed treatments for onion maggot or thrips.
- H Investigate ecology of onion thrips, onion maggot and their natural enemies for improved management.
- H Investigate biology and management of bacterial pathogens.
- L Investigate biology and management of Iris Yellow Spot Virus.
- M Investigate biology and management of leek moth.
- M Investigate cover crops for suppressing soilborne insects and bacterial diseases.
- H Develop best management practices for garlic bloat nematode.

Peppers

Implementation Priorities:

- M Demonstrate Phytophthora blight best management practices.
- M Improve European corn borer management in peppers.

Research Priorities:

- M Develop best management practices for Phytophthora blight
- M Breed for resistance to disease and insect pests

Potatoes

Implementation Priorities:

- H Screen varieties for leafhopper resistance.
- H Demonstrate cultural practices such as rotation, cull management, scouting seed tubers as late blight management tactics
- H Demonstrate and increase grower adoption of late blight forecasting.
- H Improve grower awareness of resistance management strategies for CPB.
- H Demonstrate the benefits of seed cutting and suberization for seed decay management.

Research Priorities:

- H Evaluation of integrated management of silver scurf and Colletotrichum black dot, including seed treatments, storage treatments, rotation and disease suppressing cover crops, fungicides, and other options.
- M Necrotic virus management strategies in potatoes.
- H Tuber blight management strategies including organic strategies (seedpiece treatments and post harvest strategies)
- M Breeding potatoes for resistance to multiple pests including Colorado potato beetle, potato leafhopper, aphids, late blight, early blight, Verticillium wilt, leafroll and other diseases.
- H Develop information for improving late blight forecasts.

Snap beans

Implementation Priorities:

Research Priorities:

- H Alternatives to fungicide applications for white and gray molds.
- H Develop improved management tactics for European corn borer.
- H Bean virus biology and management.
- H Leaf hopper control for organic production.
- M Elucidation of etiology and epidemiology of *Phytophthora capsici* in snap beans.

Sweet Corn

Implementation Priorities:

- H Demonstrate alternative control tactics for worm pests including biologicals, biotech plants, and biorational insecticides and compare their impact on important natural enemies.
- L Demonstrate management tactics for corn flea beetle, the vector of Stewart's wilt.
Improve grower success with grass weed management.
- H Demonstrate effective bird management strategies.

Research Priorities:

- H See multicrop weed management
- H Development of action thresholds for rust on late-planted and highly susceptible varieties.
- H Refinement of fresh market sweet corn IPM protocols, including relationship between trap counts and field infestations for corn started under plastic
- L Breeding for resistance to multiple pests including "worms" and diseases.
- M Screening of existing varieties for resistance.
- H Screening of corn earworm for insecticide resistance
- H Investigate biology and management (including action thresholds) of corn earworm and its potential to overwinter in NY
- H Evaluate Bt corn lines for horticultural performance and pest control under NY conditions.
- M Corn leaf aphid management through varietal resistance, threshold development, optimal insecticide use and evaluation and conservation of natural enemies.
- H Investigate biology and management (including action thresholds) of brown marmorated stink bug
- H Investigate biology and management (including action thresholds) of western bean cutworm.
- H Develop effective bird management strategies.

Field Tomato

Implementation Priorities:

- H Demonstrate bacterial disease management strategies.
- M Demonstration projects using TOMCAST forecasting system
- H Demonstration projects using late blight forecasting system

Research Priorities:

- H Investigate control of bacterial diseases - speck, spot, and canker.
- H Determine the integration of newer fungicides (non-strobilurin) for foliar disease (early and late blight)

using TOMCAST.

- H Develop information for improving late blight forecasting in tomatoes.
- M Develop strategies for managing Phytophthora blight
- H Breeding for disease resistance

High Tunnel/Greenhouse tomato

Implementation Priorities:

- H Promote the use of Fulvia fulva (brown leaf mold) resistant varieties.
- M Demonstrate benefits of pruning for disease and insect/mite control.
- M Demonstrate the benefits of ventilation, pruning and plant density as disease management tools.
- M Demonstrate the benefits of between-row mulch for control of mites, Sclerotinia and weeds.
- M Demonstrate the benefits of powdery mildew resistant varieties.

Research Priorities:

- H Screen for Fulvia fulva (brown leaf mold) resistant varieties (both determinate and indeterminate).
- H Identify effective spray materials for Fulvia control on susceptible varieties (both organic and conventional).
- H Develop cultural controls for tobacco mosaic and cucumber mosaic virus.
- H Develop techniques for prevention of ant damage in high tunnel tomatoes.
- M Identify effective materials for Botrytis management.
- M Develop cultural control techniques for Botrytis gray mold.
- M Develop techniques for Sclerotinia management in high tunnel tomatoes.
- M Identify effective, labeled materials with short PHIs for early blight management in high tunnel tomatoes.
- M Identify effective, labeled materials with short PHIs for late blight management in high tunnel tomatoes.