

Elements of IPM for Onions in New York State

PESTS		
Major Insects	Major Diseases	Weeds
onion maggot	Botrytis leaf blight	annual grasses
onion thrips	smut	annual broadleaves
bulb mite	downy mildew	perennial grasses
Minor Insects	purple blotch	perennial broadleaves
western flower thrips	Aspergillus black mold	nutsedge
cutworms	Stemphylium leaf blight	
aster leafhopper	pink root	
mites	bacterial rots	
aphids	Fusarium basal rot	
leaf miner	Botrytis neck rot	
seed corn maggot	damping off	
	white rot	
	Botrytis flower blight and scape girdling	
	Smudge (white onion only)	
	yellow dwarf	
	aster yellows	
	root knot nematode	
	lesion nematode	

A. Site Preparation/Selection	Priority	Points
1) Select varieties resistant or tolerant to bacterial rots, Fusarium basal rot, damping off, and pink root.	High	10
2) Crop rotation to control (or improve control of) sour skin/bacterial canker, Fusarium basal rot (3 years), downy mildew (2 years), nematodes, smut, black mold, onion maggot (1 mile or more in distance), and weeds	Medium	5
3) Remove cull piles, volunteer onions and field debris to improve control of Botrytis flower blight, Botrytis leaf blight, Botrytis neck rot, downy mildew, purple blotch, Stemphylium leaf blight, onion yellow dwarf, onion maggot, bulb mite,	Medium	5
4) Cultivate and destroy weeds 10 days before planting to reduce cut-worm larvae.	Medium	5

5) Tillage at least 2-3 weeks before planting if there is a heavy cover crop to avoid seed maggot problems	Low	3
B. Planting		
1) Use treated seed at planting to control damping off, and onion maggot and to help control smut.	High	10
2) Plant seed free of Alternaria purple blotch, smut, Stemphylium leaf blight,, black mold and Botrytis neck rot.	High	10
3) Do not plant deeper than 1/4 inch to avoid smut unless soil is very dry.	Low	3
4) If using transplants make sure they are free of pink root, damping off organisms and downy mildew or virus diseases.	High	10
C. Nutrient and SOIL Management		
1) Soil test every 3 years.	High	10
2) Fertilize according to the soil test for P, K and pH to amounts recommended by CU.	High	10
3) Maximum of 125 pounds of N per year broadcast after plowing. Avoid excessive N applications to allow necks to dry down and avoid infection by Botrytis neck rot, bacterial diseases and black mold.	Medium	5
4) Plant a soil building rotational crop to reduce compaction.	Medium	5
5) Use cover crops in the off season to protect soil from wind erosion and reduce compaction.	High	10
D. Pest Monitoring and Forecasting		
1) Scout at least once per week for insects and foliar diseases (onion thrips, BLB, onion maggot, downy mildew, purple blotch).	High	10
2) Use available CU thresholds for diseases, nematodes, and insects.	High	10
3) Use an on farm disease forecasting instrument or join a disease forecasting network (e.g. NEWA or CCE updates) to predict Botrytis leaf blight, downy mildew, and Alternaria purple blotch risk.	Medium	5
4) Apply fungicides according to disease forecasts	High	10
5) Make a weed map/list 3 times annually and choose herbicide/tillage strategy according to weed species and populations. See the Weed Assessment List available for use in satisfying this element.	Low	3
6) Remove and destroy any onions infected with yellow dwarf virus to avoid additional transmission by aphids.	Medium	5
7) Chose effective labeled pesticides with the least environmental and beneficial organism impact (EIQ).	Medium	5
8) Calibrate sprayer at least once per season	High	10
9) Keep complete records of soil tests, fertilizer applications, cultural practices, weed maps, scouting results, and pesticide applications.	Medium	5
10) Rotate insecticides differing in classes of chemistry for onion thrips management	High	10
11) Do not spray an insecticide (for onion thrips) that did not work well earlier in the season.	High	10

12) Monitor susceptibility of onion thrips populations to major classes of insecticides (as techniques become available - Shelton/Nault).	High	10
13) Handweed prior to weed flowering to remove escapes from herbicide treatments.	Medium	5
14) Assess or index soil for nematode populations (as techniques become available - Abawi).	High	10
E. Harvesting		
1) Minimize damage to onions while harvesting to avoid attracting adult onion maggots; reduce drops on harvest equipment to no more than 6 inches.	High	10
2) Remove all bulbs from the field at harvest in order to avoid overwintering sites for bulb mites, onion maggot, downy mildew.	High	10
3) Harvest in dry weather, allow onions to air-dry, and sort damaged onions before storing at 32¼ to 33¼ F and below 70% relative humidity to reduce spread of purple blotch, Botrytis neck rot, Fusarium basal rot, and bacterial diseases in storage.	High	10
4) Wait until onion necks are completely dry before harvesting wind-rowed onions to avoid Botrytis neck rot, black mold, neck rot, and bacterial diseases.	High	10
5) Use artificial curing if necessary (forced heated air at recommended temperature and duration) to avoid Botrytis neck rot.	Low	3
6) Clean up field to reduce overwintering weeds and onion residue prior to planting cover crop.	High	10

REFERENCES...

Specific information about the use of these IPM elements can be found in the following publications:

Hoffmann, Michael P., Curtis Petzoldt, Anne Frodsham. 1996. Integrated Pest Management for Onions. New York IPM Publication No. 119.

[Integrated Crop and Pest Management Guidelines for Commercial Vegetable Production.](#)

[A Method to Measure the Environmental Impact of Pesticides.](#) 1992. New York Food and Life Sciences Bulletin Number 139.

T.L. Widmer, J.W. Ludwig, and G.S. Abawi. [The Northern Root-Knot Nematode on Carrot, Lettuce, and Onion in New York.](#) New York Food and Life Science Bulletin No. 156. Department of Plant Pathology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY

The above reference material can be obtained from county Cornell Cooperative Extension offices