Emerging New Pests (Organic Session)

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In this session I will introduce the new edition of the Resource Guide to Organic Insect and Disease Management, and present information about some of the up and coming pests and diseases. The second edition of the Resource Guide to Organic Insect and Disease Management was published earlier this year. It is available for purchase, or as a free pdf, at http://web.pppmb.cals.cornell.edu/resourceguide/ . The new edition has chapters on four additional crop families and four additional pest and disease management materials. The biology of the disease organisms and pests is presented for each crop family, and cultural management practices are recommended. Materials are recommended for rescue treatment. A unique feature of this publication is the presentation of efficacy data for each of the 17 organic pest and disease management materials. In addition to the efficacy data, these chapters include a description of the material, how it is made, how it works, OMRI listed brands, safety and environmental effects and much more. The second edition was needed not only to include more crop families and pest management materials, but also to update the older chapters with new and/or mounting pests and diseases. The following are a few of the serious new concerns for growers in New England.

STEM AND BULB NEMATODE (*Ditylenchus dipsaci*)

The stem and bulb nematode, also called the garlic bloat nematode, is becoming an important garlic pest in the Northeast. Although first reported in the 1930s, it first appeared as a major pest in New York in 2010. Now it is found throughout the Northeast. The most common means of spread is by infested garlic seed. The microscopic worms feed by piercing root and leaf cells with their stylet. Leaves of severely infected plants turn yellow and dry prematurely. Plants may be stunted. The roots are usually at least partially missing, and the basal plate may appear to have a dry rot similar to Fusarium basal plate rot.

The pest is favored by wet, cool conditions. Although the pest is not active in hot, dry weather, such weather may exacerbate symptoms. The nematode survives freezing and/or hot weather in soil and plant debris.

Cultural Control

1. The most important way to avoid garlic bulb nematode is to use uninfested garlic for seed.
2. Monitor for symptoms of infestation during the growing season and submit suspect plants to a diagnostic lab for confirmation. Contact the lab to get instructions regarding how to take and where to send the sample.
3. DO NOT use garlic that is known to be infested for seed. Even bulbs that show no symptoms may have low levels of infestation. Do not sell any garlic for seed from a

potentially infested lot. Do not replant garlic in an infested field for at least four years. Other hosts include all Alliums, celery, parsley, and salsify.
4. Mustards, sorghum-sudan grass, and other bio-fumigant cover crops have been shown to reduce nematode populations. These nematodes can survive in dry debris, making sanitation of equipment and storage areas important.

Materials Approved for Organic Production

None.

SLIPPERY SKIN and SOUR SKIN of onion *(Pseudomonas gladioli and Burkholderia cepacia)*

With both slippery skin and sour skin the bulb of the onion becomes soft and watery. Both of these diseases have been common the past few years due to the long periods of wet weather. In slippery skin the central part of the bulb rots and pops out when the bulb is squeezed. Similar to slippery skin, squeezing an onion bulb infected with sour skin will cause the central portion to pop out, but with sour skin the central portion is not the rotten part. It will be firm and usable. Sour skin causes some of the other scales of the bulb to become translucent and viscous. Scales adjacent to rotting ones on either side may be fine. The disease gets its name from the pungent sour odor of infected bulbs.

The slippery skin pathogen is primarily a wound pathogen. Care during cultivation and harvesting is very important, especially in wet years. Sour skin a sporadic problem, and is more common when there is a lot of water from rain or excessive irrigation on the surface of the soil. The pathogen is soil-borne and transferred by accumulation of water at the neck of the onion. The bacteria move down the leaf through the neck to the corresponding bulb scale. High temperature after wet periods favor the disease.

Cultural Control

1. Avoid excessive overhead irrigation, especially late in the season. Drip irrigation may avoid the problem if there are not heavy rains.
2. Minimize wounding of leaves during fieldwork and harvest.
3. Harvest only when onions are fully mature and weather is dry.
4. There is some varietal tolerance to sour skin. The varieties Redwing, White Cloud, and Bello Blanco ranked first, second, and third, respectively, for tolerance in a trial conducted in Washington State.
5. Dry onions well before putting into storage.

Materials Approved for Organic Production

None.

SWEDE MIDGE (*Contarinia nasturtii*)
The swede midge is a serious insect pest of cruciferous plants, such as cabbage, cauliflower, and broccoli because the larvae feed on and disfigure or destroy the growing tips of the plant. The first discovery of swede midge in the US was in 2004 in western NY. The insect is native to Europe and southwestern Asia and has been known in North America only since 2000, when it was identified in Ontario, Canada. Swede midge has the potential to spread to most crucifers growing areas in the US and Canada. A Cornell website has been developed that describes its biology, the damage it causes, and management strategies. See
http://web.entomology.cornell.edu/shelton/swede-midge/
Eggs are laid on multiple growing tips of plants. Plant damage is caused by the larvae, which are small maggots. Larvae produce a secretion that breaks down the plant cell wall, allowing them to feed on the liquid contents. Larval feeding changes the physiology of the plant and results in the formation of swollen, distorted, and twisted tissue.

The swede midge spends the winter as pupae in the soil. Adult flies emerge from overwintered pupae from May through June. Mating occurs soon after emergence, and the females lay eggs in the newest growing points of the plant. Subsequent overlapping generations are produced during the summer months, ensuring problems with this pest over the entire growing season.

Swede midge injury is often difficult to distinguish from other factors that can damage the growing tip of a plant, such as mechanical injury from cultivation, other insect or animal feeding, molybdenum deficiency, herbicide injury, genetic variation of the plant, and heat or cold stress. For confirmation of injury due to swede midge, look for the larvae, which can be found on or within the plant by putting suspected damaged plant tissue in black plastic bags and leaving them in the sun for an hour or less. The light colored larvae will leave the plant tissue and be visible on the black plastic.

Cultural Control:
1. Use clean transplants.
2. Implement a two- to three- year rotation to non-crucifer crops. Control cruciferous weed hosts during the rotation period. Adults are weak flyers, but may be carried by wind to new fields, so rotate as far from an infested field as possible.
3. Destroy crop as soon after harvest as possible.

Materials Approved for Organic Production

None have been shown to be effective.