Garlic planting is going to be starting very soon, and despite a good harvest across most areas this year we continue to receive many questions about proper pre-planting treatment of seed to prevent diseases and bloat nematode. Growers are more likely than ever to take a hard look at what they are buying or saving for seed, which is a very positive development from a disease control standpoint. Discarding suspect seed now saves growers money, labor, and time later. Here are some things to consider as you go through your seed garlic and ready your garlic field this year.

**Seed Selection:**
Most of you should already have your seed at this point, but make sure that you still grade hard while cracking the bulbs before planting. Don’t just examine each bulb, examine each clove, since some diseases such as neck rots can be present on the inside edge or bottom of the clove and will not be detectable from the outside of the bulb. Remove any cloves that have signs of disease or are damaged in any way. Try to select cloves that are medium to large. However, if you are having any trouble with harvesting bulbs that contain just one clove, try to remove the very largest cloves from your seed stock this year, since sometimes extremely large cloves will not make new bulbs with individual cloves. This can also occur due to excessive cold.

**Seed Treatments for Garlic:**
A few seed treatments are available to suppress diseases and nematodes in garlic. However, none of these treatments have been demonstrated to be 100% effective by research at Cornell or other universities. Suppression of diseases and nematodes has been demonstrated.

Hot water treatment: Many organic growers are considering using hot water treatments, which are popular in western states. The key difference between our systems and theirs is scale—they have very large, very precise hot water treatment systems, which makes effective treatment much easier. If you do want to

**Diseases to look for on garlic seed:**
The following diseases are seed-borne, and will persist or multiply in your field if not culled. Check each clove carefully, and discard suspect cloves. If a bulb has widespread Penicillium, Botrytis or Fusarium, it may be better to discard the entire bulb than to crack it searching for quality cloves. Some diseases’ spores, like Penicillium, may spread by air when disturbed.

- **Penicillium (blue mold)** will persist on seed from year to year.
- **Small Fusarium lesions.** Fusarium may persist in soil or on seed.
- **Botrytis porri** on garlic may persist on seed or as sclerotia
try a hot water treatment, make sure that you have a significant enough volume of water that when you add the garlic you will not have a large temperature fluctuation. The timing of treatments and the temperatures need to be very precise, or they will either be ineffective or will cook your garlic, which will lead to stunting or death of seed.

The standard treatment for nematodes is a 30-45 minute warming period at 38°C (100°F) followed by exactly 20 minutes at exactly 49°C (120°F) with a cooling period of 10-20 minutes at 18-22°C (64-72°F). Crack seed prior to treatment, and plant as quickly as possible after treatment. Research examining adding bleach to the hot water treatment (Roberts and Matthews, 2005) found that addition of 1.05-2.6% sodium hypochlorite (AI in bleach) during the hot treatment were consistently effective for controlling bloat nematode. However, it doesn’t appear that this treatment is OMRI approved, since bleach is not allowed to contact organic produce, only to disinfect equipment.

Vydate (nematode suppression only): This restricted-use nematicide has received a 24(c) label for use in garlic in New York for use on bloat (stem and bulb) nematode. It can be used as a broadcast application at a rate of 2 gallons per acre with a minimum of 20 gallons of water within one week of planting, or as an in-furrow treatment at the rate of 3/4 to one gallon per acre in a drench with 100-150 gallons water or 1.5-2 gallons per acre in 20 to 50 gallons water as an in-furrow band spray at planting. All applications must be incorporated by water or mechanically to 4-6 inches. Dr. Abawi has been trialing the use of Vydate for bloat nematode suppression in the greenhouse, and his initial findings were very promising.

Pre-planting fertilization: Aside from starting with quality, disease-free seed, the most important thing you can do to ensure a good garlic harvest next year is start with good soil with adequate fertility. A loose, well drained soil is ideal for garlic. Heavy clay soils and soils with poor drainage are known to produce poorer stands with more disease problems. Ideally, your garlic field was chosen well in advance, and has been prepared using cover crops and/or weed control techniques that will benefit your garlic crop.

After selecting your field, review your soil test results. The fertility table (below) from the New England Vegetable Management Guide provides guidelines for pre-plant and in-season fertility. If you can use an organic source of Nitrogen such as alfalfa meal this fall, or you can rely on N from a recent cover crop, do so. The garlic only takes up a little N in the fall, since most growth should be taking place in the roots. –Crystal Stewart, CDVSFP

Sources:


Garlic fertility requirements

<table>
<thead>
<tr>
<th>Garlic</th>
<th>Nitrogen (N) Lbs/A</th>
<th>Phosphorus (P₂O₅) Lbs/A</th>
<th>Potassium (K₂O) Lbs/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Test Results</td>
<td>Very low</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Incorporate at planting</td>
<td>40</td>
<td>150</td>
<td>100</td>
</tr>
<tr>
<td>Sidedress at 6” tall</td>
<td>40</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sidedress 3-4 weeks later*</td>
<td>40</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>120</td>
<td>150</td>
<td>100</td>
</tr>
</tbody>
</table>

*Do not apply any N fertilizer after bulb initiation has begun. This could reduce yield.
This week I was called into a field of pie pumpkins to look at fruit breakdown. Before even seeing the field, my first thought was Phytophthora blight, but after looking at the fruit, I was convinced that the problem was not caused by *P. capsici*.

The symptoms looked similar to Phytophthora, with a white cottony growth on the fruit surface touching the soil, but it was much more fluffy than Phytophthora (Figure 1). Dr. Tom Zitter, Cornell, examined the photos and we have come to the conclusion that the problem is due to Pythium fruit rot also know as Cottony Leak. This disease has been brought on as a result of prolonged saturated field conditions. There was no evidence of any issues prior to Tropical Storms Irene and Lee and the crop had been treated properly for Powdery and Downy mildew. Secondary pathogens such as bacterial soft rots moved in after the initial Pythium infection (Figure 2).

The following information was found in High Plains IPM Guide, a cooperative effort of the University of Wyoming, University of Nebraska, Colorado State University and Montana State University, written by Howard F. Schwartz and David H. Gent:

“Identification and Life Cycle - Pythium fruit rot of cucurbits is caused by several fungus-like organism of the genus Pythium. The disease is most severe on cucumber, but watermelon, pumpkin, and melon can also be affected. Pythium spp. are found in most, if not all soils, of the world. Fruit infection occurs through wounds or where fruit touches wet soil. The pathogens grow quickly through diseased tissues. The Pythium fruit rot pathogens are readily disseminated within and among fields in irrigation water and on contaminated equipment. Pythium spp. survive between cucurbit crops as pathogens on many crops and weeds, and as dormant resting structures in soil.

Plant Response and Damage - Pythium fruit rot symptoms begin as brownish, water-soaked lesions that quickly become large, watery, soft, and rotten. The rot generally begins on the parts of fruit in contact with the soil. In cucumber, a brown to dark green blister often is apparent on fruit before they become watery and rot. White cottony mycelium is apparent on rotten tissues, especially during humid weather. Pythium fruit rot is most severe in poorly-drained fields during wet weather. The disease can render fruit unmarketable.

Management Approaches - No biological control strategies have been developed for Pythium fruit rot.

Cultural Control - Cucurbits should be planted on sandy, well-drained soils to allow rapid drainage after rain or irrigation. Avoid dense plant populations and narrow row spacing that leads to dense vine matting. Plastic mulch can provide some disease reduction in semi-arid production environments, but should not be used with overhead irrigation or in high rainfall production areas because water accumulates on the plastic and promotes fruit decay.”

Ridomil Gold SL or other labeled formulations mefenoxam are labeled for control on all cucurbit crops but, in a case like this, we are not sure they would be very effective.—*CDB*
As you begin to dig sweet potatoes, it is worth mentioning a few tips for harvesting, curing and storing your roots. The one thing that I continue to remind myself of is that sweet potatoes are nothing like your standard Irish potatoes. In fact, they have very little in common. Sweet potatoes are much more delicate and require more attention when harvesting and storing.

First, frost does impact sweet potatoes. It is very important not to let the roots get exposed to cold temperatures (less than 50°F). Sweet potato vines can be hit with a light frost, but when roots are exposed to prolonged colder temperatures, they can form an internal white ring of tissue which decreases the quality of the root. The roots will not store as long or taste as good. This is why we recommend storing sweet potato roots at around 55°F. I would say if the soil temperatures are still above 60 degrees, the roots should continue to size up as long as the vines are not dead. However, with all the rain the last couple of weeks, it would be important to see what your soil temperatures are. It looks as though we are going to be in a slightly warmer, but rainy weather pattern into next week, so what I would recommend is putting a floating rowcover over the top of those sweet potatoes to help build a little more heat in the beds and promote some additional root sizing. I wish I could see into the future, but I would say hopefully we have a little more growing season left.

Let me reiterate: sweet potatoes are nothing like Irish potatoes - the way they grow, the temperatures for curing and storing and vine killing etc. Mowing or cutting the vines will help make the harvest go easier, but it will not help “set” the skins or “toughen up” the skins as it does with regular Irish potatoes. You can mow and dig sweet potatoes the same day and the skins would be no different than if you cut the vines two weeks prior to harvesting.

If you are using a mechanical digger such as a potato digger to harvest your roots, make sure you run the chain as slow as possible and carry as much dirt up the chain as possible to reduce the amount of bouncing that occurs.

The sweet potato has a thin, delicate skin that is easily broken. Any cuts, bruises, or skin abrasions will reduce quality and storability significantly. With our wet soils, these abrasions can also allow for soft rot bacteria to get into roots and rot them in storage. It might even be worth taking the shakers off of your digger to reduce the amount of bouncing of the roots on the rods. The longer the chain, the more dirt that can sift down through the rods exposing the roots which can then allow workers to pull the roots off the digger before they are put back on the ground. This would eliminate one more potential bruising opportunity.

If possible when picking up your sweet potatoes, use some kind of slotted crate or small bin (apple bins, milk crates etc.) that will allow air to flow through them. Instruct your workers to gently place them in these containers. If picking up with buckets and dumping into bins, reduce the distance the roots have to fall as much as possible. This again will help reduce cuts and bruises.

Do not wash your roots until you are ready to go to market with them! Remove as much dirt as possible when digging, keep them dry and place directly into the harvest containers. These containers should then be taken an area to cure. Ideal curing conditions are a temperature of 85°F with 90% humidity for at least 10 days. The curing process allows any cuts, abrasions or bruises to heal which allowing for better storability of roots. At this time of year empty greenhouses can be an excellent place to cure sweet potatoes, but there are a couple of things that need to be done. First, floors of the greenhouse should be watered several times a day in order to keep the humidity levels at 90%. Second, make sure fans are set for 85°F and the heater is turned on and set to keep the greenhouse as close to 85°F night.

Once your sweet potatoes are cured, store as close to 60°F as possible, but no lower, and maintain a high humidity. If done properly, sweet potatoes should easily store into January or even February. –CDB

Fall-tillage Tips for Vegetables

Written by Daniel Brainard, Michigan State University Extension, Department of Horticulture

Decisions about how and whether to till vegetable fields in the fall are complex and depend on balancing soil, nutrient, pest and economic considerations. Fall tillage is helpful for managing many pests of vegetables and for incorporating soil amendments, but can also lead to soil degradation, nutrient losses and unnecessary expenditures in some cases. Below are a few key principles to keep in mind when making decisions about fall tillage.

Avoid tillage when fields are wet
Tillage when soil is wet (above field capacity) can lead to soil compaction, soil smearing and clod formation, all of
which ultimately reduce crop yields. Since soil moisture in late summer and fall is often lower than in the spring, fall-tillage can reduce the risk of these potential problems. On the other hand, if fields are wet in the fall, it may be better to wait until spring in the hopes that moisture conditions will be more suitable. Delaying tillage until spring is less risky on fields with light, well-drained soils and on those where late-planted vegetables are planned.

**Time tillage to suppress insects and diseases**
Many vegetable insects, such as squash vine borer, and pathogens, such as black rot, survive in crop residue. Therefore, fall-tillage can reduce the risk of recurrence of these pests by burying residue in the soil where microorganisms speed decomposition. However, for insects and diseases that do not depend on crop residue for survival, like migratory pests and some soil-borne diseases, fall-tillage often provides little benefit and may even increase survival by burying pests and their propagules (larvae, spores) to depths where they are less vulnerable to decay or where they are induced into a dormant state. Under these conditions, subsequent tillage may bring them back to the surface to infest future crops. Clearly, knowing the rotational and pest history of a field, as well as the life-cycle of key pests, is valuable for making optimal tillage decisions.

**Time tillage to suppress weeds**
Tillage can impact weeds by uprooting or burying seedlings, changing the depth of weed propagules (i.e., seeds) in the soil, and by stimulating seed germination. If you’ve just harvested a vegetable field and perennial (i.e., horsenettle) or winter annual seedlings (i.e., chickweed) are taking hold, fall-tillage may be an important weed management strategy. Likewise, if immature summer annual weeds (i.e., lambsquarters or pigweed) are present that are likely to produce seeds before a killing frost, tillage is one option for preventing seed production.

On the other hand, if your field is loaded with weeds that have already shed thousands of seeds on the soil surface, delaying tillage until late fall or spring may be beneficial; seeds left on the soil surface are more vulnerable to consumption by seed predators or decay organisms than those buried through tillage.

Also keep in mind that for many weed species, tillage can result in a flush of weeds by exposing seeds to germination cues including light and soil nitrates. Winter annual weeds – including many in the mustard family – are particularly sensitive to these cues in the early fall. Therefore, delaying tillage until late fall or early spring is one strategy for reducing potential problems with these weeds.

**Time tillage to manage manure and minimize nutrient and soil loss**
Incorporation of manures within 12 hours of application is generally recommended to avoid loss of N as ammonia. Since manure applications must be made 90 to 120 days before crop harvest, manure application and associated tillage is most safely accomplished in the fall. This is particularly true for vegetables that are in contact with soil and are destined for fresh consumption. However, keep in mind that tillage in the fall exposes soil to erosion and can result in significant nutrient and soil losses.

Where fall-tillage is used for manure incorporation or disease management, planting a cover crop immediately following tillage, like winter rye, can reduce nutrient losses and protect the soil. Manure application and incorporation technologies that leave at least some crop residue in place, such as injection systems and vertical tillage, are also useful for minimizing soil loss.

**Implement conservation tillage where possible**
Although strict no-till production is challenging in vegetable crops, many opportunities exist for reducing the number of tillage passes or the amount of soil disturbance with each pass. Less tillage can result in lower costs, improved soil characteristics and, ultimately, higher yields. Conservation tillage practices range from relatively simple approaches, like using less aggressive tillage tools (i.e., chisel plow or spade instead of a moldboard plow or rototiller) or planting fall cover crops with a no-till drill, to more experimental approaches like “zone tillage,” where tillage is targeted only
New late blight finds in the past week:

September 19 on tomato in a commercial field in Montour Co., PA. Montour county is in central PA.
September 19 on tomato in a market garden in Monroe Co., NY. Monroe county is in western NY.
September 16 on tomato in a home garden in Jefferson (northern) NY
September 16 on tomato in home garden in Chenango Co., (south central) NY
September 16 on tomato in a commercial field in Wayne Co., (north central) NY
September 15 on tomato in a home garden in Genesee Co., NY in a second commercial potato field. Genesee Co. is in western NY
September 14: Genesee Co., NY on tomato in a home garden

Email and text alerts are now available from usablight! Go to http://usablight.org/ and use the quick links below the map to sign up for an account and/or alerts. If you find late blight please also report it at http://usablight.org/ and send a sample to the Bill Fry lab at Cornell for isolate identification following the instructions on the USAblight site.

As we plan for next year, Late Blight is somewhat less of a concern than other persistent diseases that overwinter more easily. These include Early Blight, Bacterial Spot, Speck and Canker, Septoria Leaf Spot and Leaf Mold (an emerging field disease of NY tomatoes. Crop rotation is the single most important tool in disease management. We recommend that soil now dedicated to tomatoes, eggplant, peppers and potatoes not see any of these crops for 3 years if possible. Vine crops such as pumpkins, cucumbers and squash also share a disease known as Phytophthora Blight. So it’s best to stay away from these as well. The best rotations include small grains and legumes which disrupt weed life cycles as well as pathogens and pests specific to vegetable crops. There is still plenty of time to sow a cover crop after vegetables have been pulled this fall. Interested in options? Go to covercrop.net on the internet to learn more.

To reduce the impact of Late Blight in 2012, it is very important to destroy any infected potato tubers, including volunteers and cull piles, which can be sources of infection in the Spring.

Late Blight Update courtesy Abby Seaman and the NYS IPM program. Management options from Veg Edge, Vol 7 issue 25.

Continued from page 5

to the area of the field where it is needed most. For example, strip-tillage systems commonly used in field crops can be successfully adapted to vegetable productions systems (see Photos 1 and 2).

In sum, decisions about whether, when and how to till should be guided by the knowledge of how tillage impacts specific soils and pests. When specific benefits of fall tillage are not obvious, consider saving time and money and improving your soils by delaying, reducing or eliminating tillage.

Photo 2. Butternut squash grown under conventional spring tillage. In strip-tilled production, a winter rye cover crop was planted in the fall following light disking of last year’s bean crop; squash was planted into 9-inch wide by 12-inch deep strips that were tilled in the spring. Note that soil splash on leaves in conventional tillage is avoided where strip tillage was used.
Spotted Winged Drosophila (SWD), the vinegar or fruit flies that appeared in the Pacific Northwest in 2008 have gradually been making their way east, and has been confirmed in Connecticut, New Hampshire and Massachusetts. The Hudson Valley lab has positively identified one male fly and at least one farm has reported problems with flies but ID has yet to be confirmed. In light of these findings, fall raspberry and day-neutral strawberry growers are urged to be vigilant about this pest.

Monitor for SWD – There are two basic strategies to monitor for SWD – trapping adult flies and monitoring fruit for larval infestation. To trap adult flies, you can use a clear plastic cup with a removable lid and poke several small holes (literature reports that you should use a drill bit of 0.1875 inch) 3” up from bottom all around the cup. Pour 2” of apple cider vinegar (studies have also tested sake, azadirachtin, spinetoram and try to capture some adult flies that we can have identified. If not, I can set up traps for SWD. If you can collect a sample, that is helpful, but if not, I can set up traps and try to capture some adult flies that we can have identified.

**Sugar Water Extraction Method**: Lightly crush fruit and place in a plastic quart-size bag. Add sugar water (4 cups of water and ¼ cup of sugar) to the bag. If fruits are infested, white SWD larvae will float to the top, and fruit should settle on the bottom. Because some fruit may float at first, this process may take up to an hour.

**Cultural Management**

Harvest fruit as soon as they are ripe and at regular intervals. Make sure that pickers pick clean leaving no ripe fruit behind. SWD are attracted to damaged fruit, so growers should do everything possible to reduce splitting, and improving fruit quality. In some fruits, such as grapes, cherries and possibly even blueberries it may be possible to choose thicker skinned varieties that would reduce the amount of egg laying, although I have yet to find a list of those cultivars. Clean up infested fruit to help prevent a buildup of SWD. Infested fruit should be destroyed by bagging, crushing or solarizing.

Many gardening websites suggest that fine netting may create an insect barrier, but to my knowledge, there is no research data to support this claim. Growers should be aware of the challenge that wild hosts might bring. Take a look at your hedge rows for fruiting plants like blackberries, crabapples and dogwood. These may act as alternate hosts for SWD. Hot and/or dry sites may be less suitable for SWD development.

Biological control – Little is known about predators or parasites that might aid in the control of SWD. Traditional predaceous wasps may be helpful in controlling this pest.

**Chemical control** – The first step in all control strategies is positive identification. As growers in the Capital District region begin to monitor for SWD, we will need to make sure that we are always dealing with the right thing. Please call me if you think you have SWD. If you can collect a sample, that is helpful, but if not, I can set up traps and try to capture some adult flies that we can have identified.

<table>
<thead>
<tr>
<th>Active ingredient</th>
<th>Product name (EPA No.)</th>
<th>Bushberries subgroup 13-07B</th>
<th>Canebberries subgroup 13-07A</th>
<th>Cranberries</th>
<th>Strawberries</th>
</tr>
</thead>
<tbody>
<tr>
<td>azadirachtin</td>
<td>AzaSol (81899-4)</td>
<td>6 oz/A (50 gal water)</td>
<td>6 oz/A (50 gal water)</td>
<td>6 oz/A</td>
<td>6 oz/A</td>
</tr>
<tr>
<td>spinetoram</td>
<td>Delegate WG (62719-541)</td>
<td>3-6 oz/A</td>
<td>3-6 oz/A</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>spinosad</td>
<td>Entrust (62719-282)</td>
<td>1.25 – 2 oz/A</td>
<td>1.25 – 2 oz/A</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

@LGM
Waiver of Permit Requirements for Emergency Cleanup Work

Environmental Permitting in the Aftermath of Hurricane Irene
Hurricane Irene has caused widespread damage to public and private property and infrastructure from wind, flooding and stream bank and coastal erosion. Much of the replacement and repair of the damage will take place in environmentally sensitive areas such as coastal erosion areas, protected waterways, and wetlands. Permitting for construction and repair projects in these areas is suspended. When possible, work should be undertaken in consultation with the DEC to ensure that the project will be carried out in a manner that will cause the least adverse impact to natural resources. To consult on environmental impacts in the wake of Hurricane Irene, individuals and businesses may contact the Regional Environmental Permits Office (http://www.dec.ny.gov/about/50230.html).

Storm Debris Disposal Guidance
DEC is also providing general assistance and guidance to help local communities address damaged facilities, debris disposal and solid waste. DEC has developed guidance for storm-related waste from damaged areas http://www.dec.ny.gov/regulations/8751.html. Responsible parties should contact the DEC regional office (http://www.dec.ny.gov/about/50230.html) for specific project applications. In an effort to keep overall cleanup costs to a minimum and to reduce the overall impacts from the disaster debris it is important that those conducting the cleanup be mindful to separate out those waste materials which are benign or exempt from regulation, such as tree branches and limbs, from other more environmentally concerning debris during the cleanups. Care should be taken to set aside such materials as household hazardous waste, gasoline containers and propane canisters and other regulated solid wastes that would require special handling.

Emergency Spill Response
DEC is deploying spill response teams to assess flooding related spills throughout the impacted areas. DEC operates a 24-hour Emergency Spill Hotline (1-800-457-7362) for the public to notify the department of suspected spills.

Upcoming Meeting Schedule

October 11-13th—The 26th Annual Tomato Disease Workshop will be held at the Holiday Inn downtown in Ithaca, NY. The goal of the workshop is to provide a forum for presentations of new products and recent research results targeting tomato diseases. Originally started to discuss the occurrence of bacterial canker, the TDW has expanded to discuss all tomato pathogens and use of chemical, cultural and biological disease management strategies.

December 13-15—New England Vegetable & Fruit Conference and Trade Show, Radisson Hotel in Manchester, NH. More than 25 educational sessions, covering major vegetable, berry and tree fruit crops as well as various special topics. A Farmer to Farmer meeting after each morning and afternoon session will bring speakers and farmers together for informal, in-depth discussion on certain issues. http://www.newenglandvfc.org

Websites of Interest

Diagnose pest and disease problems using color pictures: http://vegetablemdonline.ppath.cornell.edu/
Cornell Guidelines for fruit and vegetables: http://www.nysaes.cornell.edu/recommends/
Download weekly wholesale prices from the Capital District Farmers’ Market in Menands: http://www.capitaldistrictfarmersmarket.org/
USDA Fruit and Vegetable Market News: www.marketnews.usda.gov/portal/fv

Cornell Cooperative Extension and the staff assume no liability for the effectiveness of results of any chemicals for pesticide use. No endorsement of any products is made or implied. Every effort has been made to provide correct, complete, and current pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly and human errors are still possible. These recommendations are not substitutes for pesticide labeling. Please read the label before applying any pesticide. Where trade names are used, no discrimination is intended and no endorsement is implied by Cornell Cooperative Extension.

Cornell Cooperative Extension provides equal program and employment opportunities.