



UMASS
EXTENSION



Vegetable Notes

For Vegetable Farmers in Massachusetts

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CROP CONDITIONS

Growers are looking back over the year and seeing the impact of late, low yields on the year's income. It's a good year to be growing a lot of different crops, but it's been one of the hardest growing years in memory. Sweet corn that was on heavier land is still suffering from the impact of wet, cold growing conditions of June and early July, yielding smaller ears that sell for less, if they are salable at all. Later plantings are doing better, but corn is in short supply overall. The same is true for tomatoes, which suffered as much from cold temperatures, wet soils, poor nutrition, and uneven weather conditions -- conditions that could not be controlled -- as from late blight, which seems to have been held at bay where fungicides were used frequently. Sclerotinia, blotchy ripening, poor shape and other defects have caused a lot of grade-outs even though tomatoes are ripening better. Prospects are good for better quality in the next several weeks, especially if the sunnier weather pattern holds. Prices are good.

SHELLED CORN FOR GREENHOUSE HEAT 2009

Agricultural Innovations Project, 2008-2010

We would like to invite interested growers to participate in a project that will increase energy independence, support local agriculture, and insulate participating growers against the kind of drastic increases in fuel costs that we saw in 2007-2008.

This is the second year of a project that is exploring the economic and environmental feasibility of using locally grown grain corn as fuel for heating greenhouses. Growers who participated in 2008-2009 found that the furnaces they installed were cost efficient, reasonably simple to set up and use, and did an excellent job of reducing or eliminating the need for supplemental heat in their greenhouses.

Our goal is to foster a regional network of renewable energy producers and users, with a focus on grain corn but also including other types of renewable energy. The emphasis of this project is on making the best possible use of our land for food and fuel production and not to detract from our ability to grow food crops. We're envisioning a system where fuel crops become a valuable rotational crop in vegetable farms and an alternative revenue stream for dairy farmers in a time of shrinking demand for silage; not a system in which the production of fuel shifts acreage away from food production.

We would like to find farms that represent a range of vegetable and floriculture businesses in Massachusetts and various types of greenhouse designs, crops and heating needs. We have funding to provide cost-share for purchase of one corn furnace or boiler per farm (up to 50% of the cost, maximum \$3000 per farm) for a limited number of farms. Although we may not be able to provide cost-share funds for all growers who are interested, we will be able to provide useful information and contacts to all interested growers.

We have included an application as a supplement in this week's newsletter. It is also available on our website, www.umassvegetable.org. If you are interested in applying to be a part of one of these regional networks and receiving cost share for the purchase of a biomass furnace please fill out the application and return to it the address listed on the application form.

SCLEROTINIA WHITE MOLD

White mold is caused by *Sclerotinia sclerotiorum*, which causes disease on more than 360 different plant species including beans, tomatoes, cabbage, lettuce, carrots and peppers. The disease can cause severe losses to susceptible crops under favorable conditions. The summer of 2009 has been favorable.

Life cycle. *Sclerotinia* overwinters in the soil as sclerotia (small, black resting structures that look much like rat droppings) and can persist there for 5-8 years. The fungus is favored by cool, moist weather, high humidity, and long periods of soil and leaf wetness. Continuous soil moisture at field capacity for ten days or more stimulates growth of spore-producing bodies from sclerotia in the soil. Spores are released into the air and travel to host crops.

White mold generally develops after or during the flowering period in beans, during head fill in cabbage, or after fruit set in tomato. The fungus needs senescing or wounded tissue to begin the infection process. All aerial parts of the plants including may be attacked but senescing flowers or leaves in direct contact with the soil are most likely to be infected. Initial lesions are small, circular, water-soaked and light green but rapidly increase in size. Affected tissues dry, turn brown, and may be covered with a white, cottony mycelium. In beans, the disease progresses through stems, leaves and pods. Infected but symptomless pods can develop symptoms after harvest. Sclerotia form in infected tissue and entire branches or plants may be killed.

Sources. Numerous weeds such as marsh elder, lambsquarters, pigweed, Canada thistle, sow thistle, and wild mustard are also hosts and can play a role in disease cycles. There are four primary methods that fields are infested with sclerotia. Often susceptible crops or weeds are infected by spores coming from adjacent infested fields. The fungus then produces sclerotia on those plants and some are returned to the soil when the field is harvested and the crop residue is incorporated. Wind transported soil or crop debris infested with sclerotia can contaminate adjacent fields. Tires and equipment caked with soil from an infested field can introduce sclerotia into a clean field. Surface irrigation water or rain water moving naturally between fields can also move sclerotia to previously clean fields. Seed contaminated with sclerotia can introduce the fungus into clean fields.

Management

Deep plowing and crop rotation are of limited value because of the wide host range of the pathogen and its ability to persist in the soil for extended periods. Sclerotia buried by deep plowing may subsequently emerge at soil surface with later plowings. Losses can be minimized by timely harvesting, rapid cooling, and storage under refrigeration. White mold is more severe where the plant canopy is dense; reduction in canopy density can be achieved by increases in row width, raised beds, plant spacing, cultivar selection, and careful attention to nitrogen levels.

- Reduce humidity and high moisture periods within the field by orienting rows in the direction of prevailing winds, avoiding excessive irrigation after petal fall, and timing irrigation to allow plants to dry before nightfall.
- Rotate with nonhosts for up to 8 years. Nonhosts include grasses, cereals, and onions.
- In fields with a history of White mold, apply fungicides at 1-10 % bloom (for beans). A second application may be necessary under heavy disease pressure. See the New England Vegetable & Berry Guide for recommendations for specific crops.
- For beans, a postharvest dip in 125 degree F water for 30 seconds can reduce development of white mold infections.
- Contans is a biological control that may be effective against Sclerotinia blight.

-Adapted from Howard, R.J. et al., eds. 1994. Diseases and Pests of Vegetable Crops in Canada. Canadian Phytopathological Society. 554 pp. and the National Sclerotinia Initiative (<http://www.whitemoldresearch.com>)

GRASS AND GRAIN COVER CROPS FOR FALL AND WINTER

Fields are opening up as early crops or failed crops are disked under. Many growers are looking at their cover crop choices. With two weeks left in August, there is plenty of time to establish a strong stand, grow organic matter, scavenge any remaining nitrogen or other nutrients, choke out weeds, and make sure soil will not erode during fall and winter rains. Grains and grasses can provide all of these functions. Each has strengths and weaknesses. Below is a list of several good choices, depending on your specific goals and field conditions.

Winter rye is easily the most common cover crop used by growers in Massachusetts, and for good reason. It is inexpensive, easy to get and establish, and can be seeded fairly late into the fall and still take. It consistently overwinters here and will continue to grow in the spring producing lots of organic matter. Some growers find it difficult to incorporate in the spring if it is left to grow into May. Seeding rate: 90 – 120 lbs./acre.

Oats can be seeded in the late summer to fall and will come up quickly, similar to winter rye. Unlike winter rye, oats will winterkill here in Massachusetts and will not regrow in the spring. For this reason some growers prefer it over winter rye since it is easier to manage in the spring. It might have to be lightly incorporated into the soil in order to germinate. To maximize nitrogen captured and held for the following crop, mix with a legume that will overwinter such as hairy vetch. Enough growth is required in the fall to give adequate cover through the winter and early spring. Try to seed by Sept. 1 or no later than 40 days before killing frost. Growers along the coast can plant later. Make sure the oats have not been cooked (used as an animal feed); cleaned, bin-run seed is fine. Seeding rate: 100 lbs./acre. As a nurse crop for hairy vetch or clover, use 35-75 lb/A.

Ryegrass is used by some growers because of its thick root system that is thought to mop up more nitrogen than winter rye or oat. There are two types: annual and perennial. Despite their names, the annual ryegrass may overwinter and the perennial ryegrass may winterkill depending on when you seed them. If you have not seeded them before and would like to evaluate them, seed a little of each in order to see their growth habits. These can also be used as cover crops in the early spring. The seed is small and light, so specialized equipment will be needed if seeding a large area. Seeding rate: 30 – 40 lbs./acre.

Winter Wheat – there is increasing interest in wheat both as a cereal grain and as a cover crop. It is easier to manage in the spring compared to winter rye: it does not grow as tall or mature as quickly as rye so there is no rush to kill it in early spring and risk compacting soils. Wheat is excellent for erosion control, for scavenging K, P and N in fall (takes up N slowly in fall, heavily in spring), suppressing weeds in spring and fall, and building soil organic matter and tilth. In spring, it can be grazed or tilled under. Plant in late summer to early fall, before mid September. Best growth will be in well-drained soils with moderate fertility; wet or heavy soils are tolerated but flooding is not. Rye is a better choice on poor soils. Use 60-120 lb/A if drilling or 60 to 160 lb if broadcasting. Seed depth should be about ½ to 1.5 inches. 1 bu = 60 lb. Wheat works well as a nurse crop for legumes such as hairy vetch or clover, either fall seeded or frost seeded in spring.

Buckwheat establishes quickly and provides a weed-smothering canopy within two to three weeks. It's one of the best cover crops for filling a short niche during the growing season. It scavenges phosphorus from soil and makes it unavailable to subsequent crops. It does well in poor or worn-out soils and newly tilled land, likes light or sandy soil, but does not grow in wet heavy soils. The dense fibrous roots take up nutrients and leave top soil loose and friable. It is easy to incorporate. If mowed before 25 percent bloom it will regrow. Pollinators as well as natural enemies of insect pests thrive on the shallow white blossoms. It is frost sensitive and will winter kill. Drill at 50 -60 lb/A, 0.5 to 1.5 inches deep or broadcast at 2 bu (96 lb)/A on a firm seedbed and disk or tine lightly. If left to overwinter, it can provide adequate soil cover with easy spring management, but it may be best used to fill a window between early and late crops.

Sorghum-sudangrass hybrids (sudex). It is getting late to get the most out of this cover crop, since it establishes and grows best in hot weather. However it could still be planted and would grow until frost-killed – which could be well into October in some years and locations. Sudex is one of the best for building organic matter, penetrating and loosening compacted layers in subsoil, competing with weeds. If left over the winter, the dead residue protects soils and is easy to manage in spring. Mowing at 3-4 feet stimulates root depth (from 6-8 to 10-12 inches) and root mass as well as production of more tillers. The most organic matter for the cost of seed of any cover crop. Incorporate while green to obtain nematode suppression. Seed at 2 inches deep if needed to reach moist soil, drilled at 35-40 lb/A or broadcast at 40-50 lb/A.

- R. Hazzard & F. Mangan, *UMass. Resource: Managing Cover Crops Profitably, 3rd edition, published by Sustainable Agriculture Network.*

ONIONS: HARVEST AND CURING TIPS FOR BEST QUALITY

As onions mature, their dry matter content and pungency increase, with a resulting increase in storage potential. Onions are ready for harvest when at least half the leaves are dead. Generally the tops will have fallen over by this time. Pull the bulbs by hand, or use equipment such as a potato digger or undercutter to cut the roots and lift the bulbs. If you wait until all the leaves are dead and dry, it's likely that the outer skins will be loose rather than firm, which may not hurt the

keeping quality but the onions will not look as nice. However, pulling too green will make it difficult to cure them well. Harvest when the weather is dry; harvesting after a rainfall or when the humidity is high increases susceptibility to post-harvest disease.

For optimum storage quality, onions must be cured soon after harvest. Optimum conditions are 68-86°F and 70% relative humidity for at least 12 to 24 h. Curing decreases the incidence of neck rot, reduces water loss during storage, prevents microbial infection, and is desirable for development of good scale color. Curing can be done in the field, preferably when the weather is warm and dry. If it rains, let them dry fully before handling – don't handle the bulbs when they are wet. A greenhouse or hoophouse also provides good conditions for curing. Temperatures in 80's will enhance the bronze color in the skins. Sunshine is good as long as it is not too hot. Extremely hot sun, with temperatures in the 90's, can produce sunscald. Onions curing on a sandy soil will get hot quicker than those lying on a heavier soil. In a greenhouse, temperatures should be held below 85 degrees F, which will probably require leaving everything wide open. Using a black shade curtain over the house can help. Curing is complete when the neck is completely dry and tight. If the neck remains open that allows entry of pathogens such as Botrytis neck rot.

The next step is topping. Mechanical onion toppers are essential for larger plantings, and for the needs of a small diversified farm are probably best obtained second-hand. Check your favorite used equipment dealers! Onions can also be topped by hand using clippers. Handle gently to avoid bruising. Defective onions (i.e. sprouted, insect damaged, sunscalded, green, bruised) should be discarded. Grade for size according to your markets.

To ensure maximum storage, onions must be promptly stored after curing. Get them out of the sun; exposure to light after curing will induce greening of the outer scales. The optimum temperature for long-term storage of onions is 32°F with 65-70% relative humidity, but it is important to bring them down to this temperature slowly. In fact, holding onions in a barn or garage so that they cool along with the average outdoor temperature in late summer and fall works quite well. Avoid cooling bulbs to well below the average daily temperature, because they will draw moisture from the warmer air, which can lead to disease. If you are selling them within a couple of months, keeping them in an un-insulated barn is fine. To hold longer, an insulated storage room will be needed.

Harvest Tips for Best Quality

- 1) Be sure onions are well dried and necks tight (i.e. the tissue does not slide when you roll your neck between your fingers) before topping. Bacterial diseases and Botrytis Neck rot can move through green tissue into the bulbs. These diseases do not move in dry tissue.
- 2) Leave 2-3 inches of neck on the bulb. This increases the distance from the cut surface to the bulb for these pathogens to travel.
- 3) Minimize mechanical injury during. Reduce drops to 6" and pad sharp surfaces. Bruises provide direct entry points for diseases to get started.
- 4) Grade out damaged onions before putting them into storage. Damaged bulbs give off moisture, which is favorable for development of diseases in storage.

- John Howell, Andrew Cavanagh, & Ruth Hazzard. Resources: CSU Extension and the University of Saskatchewan Vegetable Program.

SWEET CORN REPORT

Small ears and low yields are still being reported. It just depends on which plantings were on which soils, and how those soils handled the heavy rains and cold. Gradually fields with top quality ears are reaching maturity. Overall, corn is still in short supply. Demand and price are good. Demand exceeds supply, especially for wholesale.

Corn earworm trap counts remain high in all areas of Massachusetts, especially the central and eastern parts of the state and coastal areas.. CEW remains the driving force behind spray schedules. A 6-7 day schedule should be maintained where corn earworm is 2-3 moths per week (see table below). If you are catching 7 or more moths per week (1 moth per night or more), you should be on a four day schedule. Southern New Hampshire and one location in the

Corn Earworm Threshold		
Moths/Night	Moths/Week	Spray Interval
0-0.2	0-1.4	no spray
0.3-0.5	1.5-3.5	every 6 days
0.6-1	3.6-7	every 5 days
1.1-13.0	7.1-91	every 4 days
Over 13	Over 91	every 3 days

southeastern MA captured >100 per week and require a three day schedule. When possible, it's important to get 3-5 hours of drying time after the spray to make it more rainfast. If you have pheromone traps make sure that you move them to fresh silk to get an accurate measure of CEW activity. Given variable winds, thunderstorms, and weather fronts going many different directions, it is not surprising to see differences between farms, making it important to keep track of flight in your field. Keep checking traps at least twice a week so you don't have a surprise attack from a CEW infestation in your silking corn. Numbers can reach alarming levels overnight when weather fronts move up the coast from the South.

European corn borer is generally declining, though high trap counts were reported at a couple of locations. We sometimes see a second peak in late August, which may reflect a partial third generation. It is important to know that the ECB overwinters here in New England in corn stalks and stems of other host plants. If you are finished picking in a field make sure to chop stalks and till in the plant debris to cut down on next years population.

Location	Z1	EII	Total ECB	AVG CEW	FAW AVG
CT Valley					
South Deerfield	2	28	30	-	-
Deerfield				6.5	-
Sunderland (1)	0	4	4	14	-
Sunderland (2)	0	0	0	75	0
Hadley (1)	0	8	8	-	-
Hadley (2)				39	
Granby	0	0	0	0	-
Easthampton	-	-	-	14	-
Hatfield	5	0	5	13	-
Whatley	1	27	28	-	-
Central & Eastern MA					
Sheffield	1	0	1	5	-
Lancaster	0	0	0	15	0
Tyngsboro	3	0	3	4	0
Concord	0	0	0	90	0
Northbridge	1	5	6	30	8
Spencer	0	0	0	25	0
Dracut	0	0	0	48	0
Rehobeth	0	6	6	14	0
Seekonk				200	
NH					
Litchfield, NH	0	8	8	146	25
Hollis, NH	0	2	2	43	3
Mason, NH	0	0	0	58	5
VT					

Sweet Corn Trap Counts

Late season field management.

Early fields are starting to get tilled under and ready for cover crops. Make sure to get your cover crops in as soon as possible to conserve the nitrogen from crop residues. The sooner that rye or oats is planted, the more nitrogen you will recover from the soil and hold over for next year. Given the rising price of fertilizer, each extra week of cover crop growth will give you a worthwhile payback. Research conducted by Stephen Herbert of UMass has shown that planting rye or oat after September 15 dramatically reduces the ability of the roots to reach the available N in the soil and to produce enough canopy to protect soil from erosion. Cover crops planted in August develop larger, deeper roots and more canopy – providing better Nitrogen uptake, less leaching, and more protection of soil from erosion. Planting legume cover crops along with oat or rye will provide additional nitrogen for next season. Hairy Vetch and red clover are two options.

Location	Z1	EII	Total ECB
CT Valley			
Hadley	0	31	31
Deerfield	2	24	26

Pepper Trap Counts

Pepper. As ECB flight declines, there is less need for regular sprays in pepper. Typically we have used a threshold of 20 moths per night at the end of the flight as the trigger for ending regular sprays. Continue monitoring traps.

- C. Huffman & R. Hazzard

UPCOMING MEETINGS

Massachusetts Tomato Contest

Monday, August 17th; Boston's City Hall Plaza Farmers' Market

Program Details: http://www.mass.gov/agr/markets/tomato_contest.htm.

The 25th Annual Massachusetts Tomato Contest will be held at Boston's City Hall Plaza Farmers' Market on Monday, August 17th in conjunction with the City Hall Plaza Farmers' Market and the start of Massachusetts Farmers' Market Week.

Farmers who want to submit entries can bring tomatoes to the City Hall Plaza Farmers' Market by 10:15 am on August 17th or drop their entries off with the corresponding registration form to one of several locations around the state on August 15th or 16th. These tomatoes will be brought into Boston on Monday.

For the complete details, including contest criteria and a registration form, go to: http://www.mass.gov/agr/markets/tomato_contest.htm. The 25th Annual Tomato Contest is sponsored by the New England Vegetable and Berry Growers Association and Massachusetts Department of Agricultural Resources in cooperation with the Federation of Massachusetts Farmers' Markets.

Redesigning a Garden Center and Farm Stand for Future Growth

September 2, 2009; Volante Farms, Inc., 226 Brookside Rd., Needham, MA

4:30 PM to 7:00 PM

Program details: www.umass.edu/umext/floriculture/upcoming_events/index.html

Volante Farms, farmstand and garden center recently redesigned and constructed their garden center featuring a new, state-of-the-art 16,000 square foot gutter-connected greenhouse with rainwater collection, ebb and flood benches, heated floor, shade curtains and more. Join us for pizza and an evening learning about their renovation.

Cosponsored by University of Massachusetts Extension Greenhouse Crops and Floriculture Program and Massachusetts Flower Growers Association. For more information, contact: Tina Smith 413-545-5306 – tsmith@umext.umass.edu, Paul Lopes 508-295-2212 ext. 24 – lopes@umext.umass.edu or Bob Luczai 781-275-4811 - bluczai@ballseed.com

New England Vegetable and Fruit Conference

Tues-Thurs Dec 15-17; Center of New Hampshire Radisson, Manchester, NH

Three days of informative sessions and farmer-to-farmer networking! More details to come. Mark your calendars now! Get the latest info at <http://www.newenglandvfc.org/>.

Out of State Programs:

Tues Aug 13. The Organic Project: Organic Apple Production. UVM Hort Farm, 65 Green Mountain Drive Burlington VT. 2-5pm. Cosponsored by NOFA-VT and the Organic Project. \$10 for NOFA members, \$15 for non-members. For info, please contact NOFA VT at 80-434-4122 or info@nofavt.org.

Thurs Aug 20. New Hampshire Vegetable & Berry Twilight Meeting, Blueberry Bay Farm, Stratham NH. 5:15-7:30pm. Emphasis will be on pesticide-free growing of mixed vegetables, raspberries, and blueberries. For info, please contact Nada Haddad at nada.haddad@unh.edu or 603-679-5616.

Wed Sep 2. New Hampshire Vegetable & Berry Twilight Meeting. UNH Woodman Horticultural Research Farm, Durham NH. 5:30-7:30 pm. Ag Experiment Station Research on Horticultural crops. For info, please contact Becky Grube at becky.grube@unh.edu or 603-862-3203..

Wed Sep 2. Soil and Soil Health. Wellspring Farm CSA, 182 LaFirira Pl, Marshfield VT. 5-7 pm. Sponsored by NOFA-VT. \$10 for NOFA members, \$15 for non-members. For info, please contact NOFA VT at 80-434-4122 or info@nofavt.org.

Thurs Sep 17. Biological Control for Ornamentals in Greenhouses – Putting it all together. Tolland County Extension Center, Vernon, CT. 9:30am-3:30pm. For info, see http://www.umass.edu/umext/floriculture/upcoming_events/index.html.