UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

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CROP CONDITIONS

The state has been blanketed with steady, heavy rainfall this week, adding more water to fields that are already saturated and rivers that are already full. The amount of rainfall has exceeded 2-3 inches in most locations, and exceeded five inches in the Berkshires. It has been accompanied by 2-3 days of continuous leaf wetness with temperatures in the 55-65 degree range. More flooding from rivers as well as pooling in saturated fields can be expected, though hopefully this flooding will be less damaging than the torrents delivered by Tropical Storm Irene. In the Connecticut Valley and its rivershed as well as in the Berkshires, crop losses are being assessed at many millions of dollars, affecting hundreds of acres and dozens of vegetable farms.

Downy mildew is affecting all the cucurbit crops, bringing foliage down rapidly in unsprayed fields. This disease does not affect fruit, but of course all cucurbit fruit is highly vulnerable to diseases such as black rot, Fusarium fruit rot and Phytophthora blight under the current wet conditions. Growers are working hard to bring in squash crops during dry periods. Late blight was confirmed at one MA location this week; conditions were highly favorable for late blight this week with weekly severity values 12-14 across the state and tomato crops that are still in good shape and producing fruit need regular fungicides. However, field tomato quality and quantity is winding down. Fall high tunnel tomatoes, especially those that were started later and are just coming into production, should be able to carry on after field tomatoes go down – if growers and customers have not had their fill of what has been a good harvest of tomatoes this year. Brassicas grow well under cool wet conditions, but are also vulnerable to diseases.

Remember that fall-grown crops continue to need a strong fertility program, including side-dressing, especially given that large amounts of rain have leached out soluble nutrients and cooling temperatures slow the conversion of organic matter into readily available forms of Nitrogen.

We look forward to seeing you at Four Town Farm next Wednesday! More details are in upcoming meetings and on our website, www.umassvegetable.org. This is the last weekly issue of Vegetable Notes for 2011; we will continue biweekly issues into October.

CHECKLIST FOR HARVEST AND STORAGE OF POTATOES

Potato fields that have been saturated with water will be especially prone to post-harvest diseases. Bacterial soft rot (*Erwinia* species), Fusarium dry rot, pink rot (*Phytophthora erythroseptica*), and Pythium leak are four serious tuber rotting pathogens that cause the most significant losses in storage. These pathogens can be brought in on infected tubers or survive on storage debris. Many of them take only a few weeks to destroy a tuber and then spread through the storage pile. Growers may be aiming for short term or long term storage and sales, or some of each, and attention to the harvest, curing, and handling issues can help maintain quality.

Note that fields that were flooded by river water are considered contaminated and should not be harvested.

Two management practices that reduce post-harvest losses are: allowing tuber skins to mature in the field before harvesting and eliminating free moisture in storage areas. There are some risks from leaving tubers in the soil, however. Rhizoctonia black scurf and silver scurf (*Helminthosporium solani*) may be at high levels on the tubers and will increase in

severity as long as tubers remain in the soil. Wireworms can also cause tuber damage. To avoid these diseases and pests, harvest should begin as soon as skins are set. If the weather remains wet during the harvest, soil may adhere to the tubers during harvest and promote soft rot.

Potatoes should be harvested at pulp temperatures that allow for successful storage. Allowable pulp temperatures vary based on storage ventilation systems, varieties, availability of cooling air, and timeliness. If potatoes are harvested during hot weather (above 80F) and cool off slowly the likelihood of storage rot is increased. Potatoes destined for storages with refrigeration could be harvested at 62 to 65°F pulp temperature. Storage areas with no refrigeration should not be loaded with potatoes with a pulp temperature above 60°F.

Healing of cuts and bruises is most rapid at high relative humidity (95%) with a tuber temperature of 50°F to 60°F and adequate through the pile ventilation. This temperature should be provided for two to three weeks at the beginning of the storage period. This process is called suberization. Effective suberization will reduce evaporative weight loss and prevent rot organisms from entering damaged tubers.

If pulp temperatures are higher than recommended it is more difficult to manage critical environmental conditions in storage. Time your harvest when cooling air is available to allow open outside doors and 3 to 6 hours of fresh air per day. Questionable potato lots should be harvested closer to 55° F if they must be stored. For later harvests, avoid harvesting at temperatures lower than 45 degrees as this increases the occurrence of bruising. Below is a list of guidelines that can be used during harvesting and storage to help prevent the spread of the diseases mentioned above and to maintain high quality potatoes.

After suberization the temperature should be lowered gradually to 40°F for tablestock or seed or maintained at 50°F for chip stock varieties. When a rot potential such as field frost, late blight or ring rot is present, the curing period should be eliminated, the temperature dropped and the ventilation increased. The crop should be utilized as soon as possible.

Vine killing

* Vine killing stops tuber growth at the desired maturity, stabilizes the tuber solids, and promotes skin set.
* Mechanical or chemical methods or a combination of the two can be used to kill potato vines.
* More than one application of a chemical desiccant may be required.
* Vine killing permits easier digging and harvesting operations.

Disease management

* Foliar diseases, especially late blight, are still a threat as vines begin to die or vine killing methods are implemented. These pathogens can spread to tubers and cause problems in storage if they are not controlled prior to harvest.
* Application of a desiccant followed by a fungicide application a few days later is recommended rather than simultaneous applications to ensure thorough coverage of the remaining plant material.

Skin set

* Most tuber diseases require a wound to infect potatoes. Good skin set greatly reduces the amount of wounding at harvest and increases the storability of tubers.
* Allow 10-14 days for skin set on the tubers in the field before harvesting.

Wounding and bruising prevention

* Check harvesting and transporting equipment to make sure it is working properly and does not bruise or wound tubers.
* Harvest when the soil is moist but not too wet. Tuber pulp temperatures around 60-65°F make the potatoes less susceptible to bruising and wounds compared to lower temperatures.

Grading

* Grade out diseased tubers as quickly as possible. The longer they are mixed with healthy tubers, the higher the chance of disease spread.

Healing period

* The 'curing', 'suberization' or 'wound healing' period immediately after harvest is critical to successful storage.
*Store tubers at about 50-60°F at high relative humidity (95%) for 10-14 days to allow wounds to heal before placing potatoes into colder storage. Lower RH results in poor suberization.
* Airflow over and through the pile is important to supply oxygen and prevent condensation. However, do not overdry the potatoes during curing.

Storage

* Before storing potatoes, facilities should be cleaned and thoroughly disinfected. Inspect to make sure to check the insulation, fans, humidifiers, and ventilation system are working. If any of these are in poor condition it could result in losses due to disease.
* After the curing period, cool potatoes gradually and steadily to the holding temperature suited to your goals: 38-40 F for tablestock, and seed potatoes, 45-50F for chipping, and 50-55 F for French fry stock.

Diagnostics

* Don't assume that every tuber rot is late blight. Send samples to the Plant Disease Diagnostic lab to get an accurate diagnosis. Different tuber blights need different management and proper identification can guide management practices next year to prevent reoccurrence. Phone for UMass Diagnostics Lab: 413-545-3209.
* A good online resource on tuber diseases can be found at http://vegetablemdonline.ppath.cornell.edu/factsheets/Potato_Detection.htm#Click2
* However, finding a photo online that looks like your problem is not the same as having a plant pathologist confirm what is on YOUR tubers!

-- R Hazzard, A. Cavanagh and M.B Dicklow; compiled from the following sources: Vegetable Crop Update, U of WI, 8/13/10, edited by C. MacNeil, CCE, CVP for Veg Edge, Cornell CES; New England Vegetable Management Guide; Potato Production in the Northeast: A Guide to Integrated Pest Management.

SWEET POTATO HARVEST & STORAGE

Sweet potatoes are becoming an increasingly popular crop to grow, with strong market interest from consumers. Their harvest and storage needs differ from other common New England root crops.

Sweet potato roots continue to grow until the leaves are killed by frost or until soil temperatures fall consistently below 65F, whichever comes first. Time of harvest is often determined by digging up a few representative plants and determining the percentage of roots in the size classes.

When tops of the plants turn black after the first frost, it is imperative to harvest as quickly as possible regardless of root size.

Sweet potatoes are very susceptible to damage at harvest. Sweet potato roots do not have a thick protective outer layer of cells such as that on white potato tubers. Abrasions and wounds can lead to rots in storage.

Curing immediately after harvesting is recommended when selling sweet potatoes wholesale. This minimizes damage and loss during storage by healing harvest wounds. To cure, maintain roots in temperatures between 80°F to 86°F and a high relative humidity (85-95) for 4 to 7 days. This forms a corky periderm layer below the damaged areas which limits microbial invasion and water loss. A freshly harvested sweet potato is more starchy than sweet. During curing and storage, starches in the sweet potato are converted to sugars, improving flavor. It is recommended to wait at least three weeks after harvest before consuming sweet potatoes to permit the starches to convert to sugars for maximum eating quality.

Sweet potatoes can maintain excellent quality for up to a year in proper storage conditions. The ideal storage conditions for sweet potato are the same as for winter squash; moderately warm (55-60F) at 60-75% relative humidity.

- excerpted from the New England Vegetable Management Guide, nevegetable.org.

BRASSICAS: FALL DISEASES

Many growers expand their Brassica production for fall, as these crops do especially well at cooler temperatures and the harvest season can easily be extended through October or later. These crops get their start during the high temperatures and high humidity of August, then face cooler periods of high humidity and long leaf wetness as fall comes on. These conditions can result in significant disease pressure from August through harvest.

Alternaria is one of the more common diseases of brassicas, and was covered in detail in the August 11th issue of Vegetable Notes.

Bacterial Black Rot of Brassicas, caused by *Xanthomonas campestris pv. campestris* is one of the most devastating diseases of Brassica crops and can result in high losses of yield and quality. It occurs worldwide and infects all species of Brassica. In recent years, we have observed black rot to be especially common in Brussels sprouts.

Symptoms can appear at any growth stage as yellow, V-shaped lesions that extend toward the base of the leaf resulting in wilt and necrosis. It can also occur mid-leaf, as darkened dead patches of tissue between the veins. The pathogen may move into the petiole and spread up the stem or into the roots and become systemic. As the disease progresses, the veins of infected tissues turn black and the normal flow of water and nutrients is impeded. Symptoms on root crops may not be visible on foliage, but blackened veins appear in the roots. On heading crops, infection may spread into the leaves of the head. Black Rot is often followed by invasion of soft-rotting organisms.

The bacterium that causes black rot plugs the water-conducting tissue of the plant with xanthan, a mucilaginous sugar. The most important means of transmission for this pathogen is on seed and as little as 0.03% infection can cause epidemics. The bacteria can persist in infected plant debris for up to two years, especially in cabbage and Brussels sprout debris; it survives in the soil for 40-60 days. It is favored by warm temperatures and symptoms may not appear in the seedbed, allowing infected plants to be transplanted into the field. It is spread within the field by splashing water, wind, equipment, people, and insects. *X. campestris pv. campestris* can be spread long distances by infested seeds and transplants.

Cultural practices:

- Practice a three year rotation and control Brassica weeds during the rotation period.
- Select seed that has been certified as disease-free.
- Treat seed with hot water to eradicate the bacteria. Soak seed for 15-30 minutes at 122˚ F (50˚ C), dry, and test for germination. Use an accurate lab thermometer. This process must be done carefully and it is recommended that a small sample of seed be tested for the effect on germination first.
- For greenhouse-grown transplants, use clean, sterilized seed flats and trays.
- For outdoor seedbeds, locate seedbeds where Brassica crops have not been grown for 4 years and avoid areas that receive run-off from areas previously planted to Brassicas. If this is not possible, fumigate or steam sterilize soil in seedbeds.
- Avoid dense seeding rates which can prolong periods of leaf infection and favor pathogen spread.
- Monitor transplants and promptly remove and destroy infected seedlings.
- Do not trim seedlings as the bacteria are easily spread by contaminated tools.
- Do not work fields when they are wet.
- Use trickle irrigation instead of overhead, where possible.
- Avoid disposal of infected plant material in the field, or near fields or storage areas.
- Promptly incorporate crop residues after harvest to speed decomposition.

Powdery mildew of Brassicas. This disease is unusual in the US, but is reported to occur regularly in England and southern Ontario, among other locations, especially on rutabagas and turnips. Brussels sprouts, kale, Chinese cabbage, collards, broccoli, mustard and cauliflower are also reported to be hosts. The disease is rare in New England, but it does occur. Just as you would expect, the symptoms are white talcum-like growth on the upper leaf surface, starting as circular patches and expanding to cover the leaf. Leaves become pale green to yellow or tan, or if severely infected, curl and die.

The plant is rarely killed, but growth can be stunted or defoliated, and of course if the leaves are sold the disease would render them unmarketable. Note that this is a different species of powdery mildew than those that infect cucurbits, or tomato, or various ornamental crops.

Conditions that favor this disease seem to be low relative humidity with cool temperatures, water stress of the crop, and the availability of a thin film of moisture in which spores can germinate. The white powdery growth includes mycelium and spores (conidia), which can be dispersed quite long distances by wind.

Spores overwinter "with difficulty"; however, survival of the fungus is better when the host plant material lives through the winter because this enables the fungus to produce new spores in the spring. It seems possible that we may see this disease more often if we start to have consistently milder winters which allow the survival of Brassicas, and because growers are overwintering Brassica plants through protection with row covers and high tunnels. If you see powdery mildew on your Brassicas in fall, don't overwinter those plants!

Fungicides which are labeled for fungal diseases of Brassicas, especially those which also work against powdery mildew in other crops, should provide control of the disease. Apply at first indication of disease.

Cultural practices: Put crop residue under as soon as possible after harvest, control Brassica weeds which could also harbor the disease.

Downy mildew of Brassicas. This disease, caused by the fungus *Peronospora parasitca*, should not be confused with downy mildew of cucurbits (caused by *Pseudoperonosproa cubensis*), which is related but does not infect Brassica crops. Downy mildews tend to be specific to a certain plant family or even species within a plant family. They are in the same group of fungi (Oomycetes or 'water molds') that cause late blight of potato and tomato and blue mold of tobacco.

Downy mildew is an important disease of broccoli, collards, kale, cabbage, cauliflower and Brussels sprouts. It can also infect rutabaga, turnip and radish. It is encouraged by cool, moist conditions (from rain, heavy dew or fog), which are more typical in late August, September and October in our region. Infection can occur at any stage of growth. Severe infections can kill seedlings, but stem, leaf and flower/head infections can cause crop injury and loss at later stages.

The most distinctive symptom is grayish white, fluffy growth on the undersides of leaves. Irregular, angular yellow to brown spots develop on both top and bottom of the leaf. In the floral parts of broccoli or cauliflower, dark brown areas develop internally in curds or floral buds of the head. Stems and stalks of the flower head may be darkened or have black streaks, and this may be the first sign of infection in broccoli. In cabbage, internal darkening and purplish spots appear in the inner layers of the head or move upward in the head from stem infections. Secondary infection with soft rot bacteria (always smelly!) may follow the downy mildew. In cabbage, systemic invasion of the stem may occur after infection of the lower leaves. The fungus may then invade the head leaves and sporulate after the cabbage has been stored.

The fungus survives from season to season as thick-walled resting spores, called Oospores. These sexual spores can survive in the soil for extended periods and produce sporangia when conditions are moist and cool, especially at night. Disease development is favored by abundant moisture on leaves provided by dew, drizzling rain, or heavy fog. Sporulation, germination, and reinfection can occur in four to five days. The fungus may also survive in a latent state within systemically infected plants. Oospores and mycelium can be carried in and upon seed. Sporangia are carried on air currents and on wind-blown rain and when conditions are right, will germinate on leaves and produce new infections.

Cultural controls for downy mildew: Rotation out of Brassicas for at least two years; removal of crop residues which contain Oospores (may not be practical!); adequate crop spacing to encourage drying of leaves. Control in the seed-bed is very important and includes the use of clean growing medium, good drainage, and an avoidance of overhead irrigation. Resistant or tolerant varieties of broccoli have been developed; our sources list Marathon and Arcadia among these.

For current fungicide recommendations, please see the *New England Vegetable Management Guide*. Preventive spraying of protectant foliar fungicides may be necessary if environmental conditions favor disease development.

Blackleg, or Phoma leaf spot and stem canker, caused by *Phoma lingam*. Blackleg attacks many Brassica crops, especially cauliflower, broccoli, and turnip. Rutabaga, radish, and mustard cultivars are only slightly susceptible. This disease can spread rapidly within a field. Though it is favored by wet conditions, it may spread on seedlings in the greenhouse and cause problems even in dry, sandy fields.

Plants can become infected at the seedling stage or at any stage in the field. The initial source is probably infected seed. The disease has become less important in Brassica crops because of successful disease management strategies in seed production. Once present on the farm, management should focus on avoiding spread of the disease, and rotating out of the infected field for four years to eliminate the inoculum. Rogue diseased plants from seedbeds. Improve soil drainage and air circulation. Control Brassica weeds. Incorporate crop debris promptly after harvest to hasten decay. Avoid working in the fields when wet.

Symptoms of the pathogen start as slight lesions on stems at cotyledon stage which elongate, turn brown with a black to purplish border, and become sunken. The lesion extends up and down the stem, the stem becomes girdled and blackened, with many fruiting bodies (pycnidia) embedded in the tissue. Lesions may extend below the soil and attack roots. Diseased plants often wilt, lodge, and die. On root crops, symptoms occur in the form of cankers on the fleshy roots and a dry rot may appear in storage. *Phoma lingam* can survive for up to four years in seed and three years in infected crop debris. The pathogen infects seedlings, forms pycnidia, and produces abundant amounts of spores which exude from the pycnidia in long coils and are splashed to nearby plants to initiate new infections. The disease is favored by wet, rainy weather. Start with seed certified as disease-free or treat seeds with hot water.

Chemical recommendations: For organic growers: potassium bicarbonate (Armicarb 100): 2.5 to 5.0 lb/100 gal (0 dh, REI 4h). Start application at the first sign of disease and continue at 7-14 day intervals while conditions remain favorable for disease development.

- Bess Dicklow R Hazzard, A. Cavanagh. .

STORAGE DISEASES OF ONION AND GARLIC

Botrytis Neck Rot caused by *B. alli* occurs primarily on bulbs in storage. Infection of seed grown onions is initiated at bulb harvest. The pathogen overwinters as sclerotia on rotting bulbs or in the soil and may be seedborne. Onions can be non-symptomatic and disease develops during storage. Symptoms generally begin in the neck area as decay which gradually moves downward. Scale tissue becomes water-soaked and soft. White to gray mycelium may appear between scales and sclerotia and gray mold form on the shoulders of bulbs. The development of this disease is not well understood as onion plants remain relatively symptomless. The fungus produces conidia on dead or dying plant debris and penetration is usually through succulent neck tissue or mechanical wounds. The pathogen cannot infect well-dried neck tissue. A healthy onion with a well-cured neck is rarely affected by neck rot in storage.

In garlic, the disease usually appears first on necks near the soil line at any time after spring greenup when weather conditions permit. The disease is more severe when it starts early in the season. Extensive development of sclerotia is best seen on maturing bulbs just before and during harvest. The fungus moves rapidly into the succulent garlic bulb's neck region, producing a water-soaked appearance. A gray mold develops on the surface of or between garlic scales, later producing black bodies (sclerotia) which develop around the neck. Before bulbing, plants may die or recover if weather permits. Bulbs infected late break down to a soft mass, and secondary infections by other organisms follow.

Black Mold caused by *Aspergillus niger* occurs in the field, during transit, and during storage. The fungus grows saprophytically on dead tissue and is a common inhabitant of the soil; spores are also common in the air. Bulb infection usually occurs through injured tissues in the neck or wounds on roots, basal stem plates, or outer scales. Uninjured bulbs are seldom infected. Seeds may be infected and the pathogen disseminated in infected seeds or transplants. Preemergence damping-off can occur if infected seed is planted. The disease is favored by warm temperatures during the growing season or in storage. Infected bulbs display a black discoloration at the neck or in bruised areas, lesions on outer scales, or black streaks beneath outer scales. As the disease develops, the entire bulb may appear black and shriveled as all scales are infected. Soft rot bacteria may invade and the bulbs exhibit a watery rot. Some bulbs will show no external symptoms, but when the bulb is cut open, central portions may be gray to black.

Fusarium Basal Plate Rot is initiated in the field on onions and garlic during growth. Affected bulbs may display no symptoms at harvest, but subsequently rot in storage. Affected bulbs may appear discolored with internal scales or storage leaves appearing brown and watery. Infected onion stem plates may be brown with white mycelium. Infected garlic may display a reddish purple discoloration on stems, bulbs, or bulb sheathes.

Blue Mold of onion and garlic may be caused by several *Penicillium* species. Penicillium decay of garlic caused by *P. hirsutum* is responsible for poor plant stand in the field and storage decay. Symptoms in the field include clove decay after planting and wilted, yellowed, or stunted seedlings. Infected plants are weak and stands are poor. Other species of *Penicillium* cause Blue Mold on onions and may be prevalent on fresh garlic. These fungi attack a wide range of fruits, vegetables, bulbs, and seeds and are common in the soil on infected animal and plant debris. Symptoms of the disease start as pale blemishes, yellow lesions, and soft spots. A blue-green mold develops on lesions. When bulbs are cut open, one or more of the fleshy scales may be discolored and water-soaked. In advanced stages, bulbs may deteriorate into complete decay. In garlic, the pathogens survive in infected cloves. Invasion of onions is usually through wounds, sunscald, or freezing injury, although the fungi are able to infect uninjured bulbs. Blue Mold pathogens are often present in internal scales of onions with neck rot.

Smudge caused by *Colletotrichum circinans* affects onions, leeks, and shallot, but not garlic. The pathogen is soil-borne, surviving in colonized onion debris and can persist in soil for many years. The pathogen is spread by infested plant material and soil, is favored by warm, wet weather, and can complete its life cycle in a few days when conditions are favorable. Smudge appears on dried outer, scales and lower portions of the bulb as dark green dots which turn black. The symptoms may be scattered, but often appear in distinct circular, concentric rings. The fungus produces enzymes that break down cell walls and allow mycelium to proliferate throughout the bulb.

Storage Disease Management

- Control other diseases and insects in the field to prevent entry of storage rot organisms.
- Black Mold can be reduced by applying calcium carbonate to protect wounds caused by leaf clipping.
- Bruising and other mechanical injury should be avoided when bulbs are harvested, stored, or transported.
- In some instances, treating of bulbs with fungicide before storing may be recommended.
- Cure onions and garlic with hot, dry conditions. A healthy onion with a well cured neck is rarely infected with neck rot during storage.
- Inspect garlic and onion before storing and discard all symptomatic bulbs.
- Practices that hasten curing include undercutting bulbs to sever all roots, avoiding nitrogen fertilization late in the season, and proper plant spacing.
- Ideal storage conditions are at 32-34˚ F with 70-75% relative humidity.

- M.B. Dicklow, UMass Extension

UPCOMING MEETINGS

Massachusetts Raw Milk Dairy Days

September 10th and 11th

Eleven Massachusetts dairies that sell raw milk will open up their farms for tours and other activities on Saturday, September 10 and Sunday, September 11. Visit your local dairy and learn why raw milk tastes so good and why it's so good for you! Meet your farmers and their cows and get to know where your food comes from. See http://www.nofamass.org/programs/organicdairy/dairyday11.php for a list of dairies and schedule, or email winton@nofamass.org.

Twilight Meeting at 4-Town Farm

Wednesday September 14, 3:30pm to 7:00pm

Location: 4-Town Farm, 90 George St., Seekonk, MA 02771

Hosted by the Clegg Family

Sponsored by UMass Extension Vegetable Program

Join us for one of our last 2011 vegetable twilight meeting, hosted by the Clegg Family at 4-Town farm. The Clegg family grows most types of small fruits and vegetables that can be grown in our climate. They are especially known for their asparagus, strawberries, sweet corn, melons, and fall crops. They also offer pick your own which includes strawberries,

fava beans, English peas, raspberries, pumpkins, and cut flowers.

The full program will include:

Deep Zone Tillage. The Clegg's are helping us experiment with a deep zone tillage system that may increase soil quality, reduce stress from both flooding and drought conditions, and save time and fuel in field prep.

Season extension using minimally heated tunnels and greenhouses. 4-Town farm grows greens in a bench system and is experimenting with brassicas in pots for extending the season into the winter.

Commonwealth Quality certification. Commonwealth Quality, a brand developed by the Massachusetts Department of Agricultural Resources, serves to identify locally sourced products that are grown, harvested and processed right here in Massachusetts using safe & sustainable practices.

Using the NEWA pest forecasting system with an on-site weather station. Learn about our new network of weather stations and how you can use them to access on-line weather data and pest modeling and make more informed pest management decisions in both vegetables and fruit crops.

Equipment. 4-Town farm recently purchased a high clearance corn sprayer that they feel is working very well for them and might be a worthwhile investment for other growers.

Postharvest and storage for fall crops. Cleggs will discuss their handling and storage practices for fall crops including cabbage, winter squash, carrots and turnips.

Pesticide applicator recertification credits will be offered. Refreshments will be served.

Directions from Route 195:

Take exit #1/SEEKONK/BARRINGTON RI onto FALL RIVER AVE toward BARRINGTON RI - go 1.6 mi

Bear Right on WARREN AVE - go 0.5 mi

Turn Right on GEORGE ST - go 0.2 mi

Arrive at 90 GEORGE ST, SEEKONK, farmstand and parking on the Right

For pre-registration or more information contact Andy Cavanagh at 413-658-4925 or acavanagh@psis.umass.edu. Pre-registration is encouraged but walk-ins are welcome. Attendance is free.

Brookfield Farm Twilight Meeting

Thursday October 13, 3-7pm

Brookfield Farm, 24 Hulst Rd, Amherst, MA 01002

Topics will include: winter storage of fall crops, producing late-season crops in high tunnels, heating greenhouses with a corn furnace, and Brookfield Farm's self-serve winter CSA.

Bionutrient Food Production

The 'Real Food Campaign' will be offering two kinds of courses in 2011-2012, starting in October and November. Further information may be found on their website at www.realfoodcampaign.org.

Vegetable Notes. Ruth Hazzard, editor and Amanda Brown and Andrew Cavanagh, assistant editors. Vegetable Notes is published weekly from May to September and at intervals during the off-season, and includes contributions from the faculty and staff of the UMass Extension Vegetable Program, other universities and USDA agencies, growers, and private IPM consultants. Authors of articles are noted; author and photographer is R. Hazzard if none is cited.