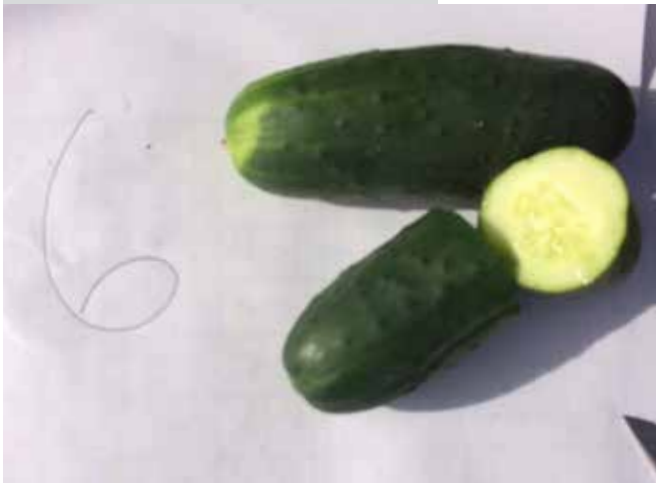
UMass Extension
Vegetable Notes
For Vegetable Farmers in Massachusetts since 1975

Volume 28, Number 19 August 18, 2016

In this issue:

Crop conditions

Tomatoes, eggplant, peppers, melons, and the first winter squash, are all being harvested. Some potatoes are coming out of the field to cure, and onions have been curing of about a week now. Growers are inspecting their earlier season winter squash (acorn, delicata, spaghetti, kabocha) fields now for fruit rots and assessing whether or not it is time to harvest and cure these crops to avoid spreading problems with intermittent down pours predicted in the forecast (see article this issue for more information). Despite the rain, parts of our state are now considered to be in an 'extreme drought' according to the US Drought Monitor, but you wouldn't know it based on wholesale prices for specialty crops. Check wholesale prices at the Boston Terminal Market for yourself here daily: Specialty Crops Terminal Markets Standard Reports. Fields of wholesale crops needing irrigation may be abandoned because the labor needed to irrigate and harvest just isn't worth the meager wholesale price. Those depending on retail sales this year report steady sales saying planting a diversity of crops is their insurance. If one crop didn't make it-a succession of lettuce for example - another did - shelling beans. And yes, our drought survey is open for one more day: https://www.surveymonkey.com/r/72TY7JF. In anticipation of workers returning to school, growers are using the labor now to bring in as much of the harvests as possible, and in general, there is a lot out there to harvest!



We are trialing several downy mildew resistant cucumbers this year – this one was bred for warmer climates but enjoyed all our heat this season and just started producing! Come see if they hold up until our Twilight Meeting on September 14th, 4-6pm. See Events section for more detials.

Pest alerts

Brassica: Cross-striped cabbage worm was found infesting 50% of a fall Brussels sprout crop in Bristol Co., MA, and to a lesser degree in Middlesex and Hampshire Cos. MA. Because this caterpillar lays its eggs in batches of 3-25, it can be fairly damaging. Therefore, spray if 5% of the crop is infested. The threshold for other caterpillars (**Cabbage loopers**, **Diamondback moth**, **Imported cabbageworm**) is 20% infestation for heading crops before heading and 10-15% for leafy crops. *Bacillus thurengiensis* aizawi or kurstaki are effective active ingredients for all the brassica caterpillars.

Cross striped cabbage worm can cause more damage than other brassica caterpillar pests because they lay eggs in batches of up to 25 each.

Cabbage aphids are now reported in Rockingham and Hillsborough Cos. NH and continue to be found in Franklin, Hampshire and now Bristol Cos. MA. Treat if >10% of the plants are infested with aphids, especially after heads or sprouts begin to form. If you have high populations of beneficials you would like to protect, consider using the following active ingredients first: azadirachtin, *Beauvaria bassiana*, insecticidal soap, or petroleum oil.

Flea beetle continues to be aggressive this year and spreads **Alternaria** spores as it

Potyvirus on 'Slick Pick' and 'Sunburst' squash. photo: A. Madeiras

Hornworm pupae. photo: M. Topitzer

Sweet pepper with pepper maggot. photo: R. Hazzard

feeds. Use proteknet or floating row cover. On young plants, threshold is 1 beetle per plant or 10% average leaf damage.

Cucurbit: **Cucurbit downy mildew** was confirmed on 'Straight 8'(susceptible variety of cucumber) in Franklin Co. MA yesterday and on cantaloupe in Suffolk Co. NY this week. We also scouted for CDM in Middlesex and Bristol Cos., MA but did not find it, but it is likely to spread across the state soon. Downy mildew specific materials should be included for fall cucumbers and melons now in MA. Thorough coverage is necessary. See suggestions in this February 2016 issue of Vegetable Notes. Monitor spread of the disease and its forecast here: http://cdm.ipmpipe.org/current-forecast

Potyvirus was diagnosed on summer squash 'Slick Pick' and 'Sunburst' from Middlesex Co., MA. Potyvirus is a family of viruses vectored by aphids and includes watermelon mosaic, papaya ringspot, and zucchini yellow mosaic virus. See this factsheet from Tom Zitter at Cornell Cooperative Extension when selecting your seed for next year: 2014 Summer and Winter Squash Varieties for Virus and PM Tolerance

Solanaceous: **Pepper maggot** has been reported as a problem for the first time in many years in Hillsborough Co., NH, but is commonplace at one farm in Middlesex Co. MA. Other farms in Hampshire Co. MA are also struggling with infestations. Pepper maggot can also infest eggplant. One grower reports that maggots are emerging from picked peppers to pupate on their counter. Unfortunately, it is too late now to make effective insecticide applications. Control needs to target the adult fly because eggs and maggots are inside the peppers. Using cherry bomb peppers as an indicator crop by checking for oviposition stings on these peppers first can help to time insecticide applications for adults. See detailed instructions from Jude Boucher in this factsheet: Pepper Maggot: Damage, Detection, Monitoring, and Management.

Tomato hornworm is causing damage now in fields in Franklin Co. MA and in NH. Perhaps you have seen a lot of sphynx, hawk or hummingbird moths this season? Or, did you see their pupae (photo) in the soil in early June? In areas with severe defoliation, spot treatment with *Bacillus thuringiensis* kurstaki or aizawi strain (Dipel DF or Xentari) is effective even on large caterpillars.

Sweet corn: **European corn borer** and **fall armyworm** were present at threshold above 15% infestation in untreated fields for the first time this season in Franklin Co., MA. A field scouted in Middlesex Co., MA this week showed damage, but no caterpillars were found. The grower suspected that the heavy bird pressure in his fields was contributing to

Table 1. Corn pest trap captures for the week of 8/11/16-8/18/16

Location	ECB	FAW	WBC	CEW	Spray Interval for CEW
Western, MA					
Sheffield	1	1	1	2	*6 days*
South Deerfield	2	1	1	0	*No spray*
Whately	3	3	-	7.5	*4 days*
Central, MA					
Bolton	5	2	-	0	*No Spray*
Leominster	2	-	-	48	*4 days*
Eastern, MA					
Concord	1	0	-	16	*4 days*
Haverhill	11	2	-	2	*6 days*
Ipswich	12	0	-	6	*5 days*
Seekonk	0	-	-	33	*4 days*
Tyngsboro	9	0	-	0	*No spray*
NH					
Litchfield	0	10	0	4	*5 days*
Hollis	*1*	*50*	*0*	*10*	*4 days*
Mason	2	3	0	16	*4 days*
Cortland Co., NY	3	13	13	0	*No spray*

European corn borer (ECB), Fall armyworm (FAW), Western bean cutworm (WBC), Corn earwom (CEW)

the caterpillar control. If caterpillars are not found in the emerging tassels, look down the plant or behind forming ears, as the caterpillars will move down the stem looking for moisture when the tassel emerges and dries out. Some growers have been able to get away with no sprays in their corn this year, although now pest pressure is building because of the second flight of ECB and more arriving FAW and CEW on storm fronts (Table 1). Egg hatch for ECB occurred at 1550 GDD, so expect damage now if moths were present in traps (Table2). Treat at threshold of 15% infestation by ECB and FAW combined. A sprayer configuration with one nozzle directed into the tassel and a single drop nozzle to the upper parts of the plant gives the best control. Use of selective products such as *Bacillus thuringiensis* aizawai or kurstaki to control caterpillars will conserve natural enemies. **Corn earworm** pressure is sporadic around New England and Western bean cutworm pressure has dropped off.

* When not given here, refer to the New England Vegetable Management Guide for scouting thresholds and treatment options.

Table 2. Accumulated Growing Degree Days (°F): 1/1/16 - 8/17/16

Location	GDD (base 50F)
Western, MA	
Ashfield	1714.6
South Deerfield	1945.5
Pittsfield	1650.4
Central, MA	
Bolton	1979.1
Northbridge	1835.5
Phillipston	1716.2
Eastern, MA	
Ipswich	1789.3
Sharon	2058.7
Waltham	2025.6
Seekonk	2085
Hollis, NH	1880
Burlington, VT	2009.3
Newport, RI	1878.3

FUNGAL FRUIT ROTS OF PUMPKINS AND WINTER SQUASH

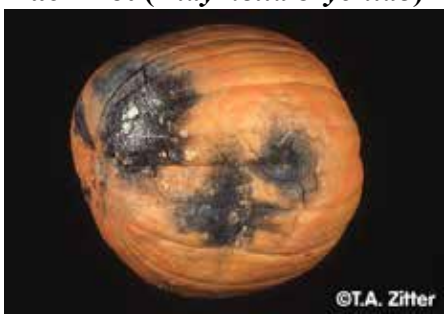
Many pathogens—fungi, bacteria, and viruses—can cause fruit rot, fruit spotting, and other fruit abnormalities in pumpkins that render them unmarketable. The vast majority of fruit rots are caused by the fungal organisms discussed in this article, although several bacteria (*Xanthomonas campestris* pv. *cucurbitae* and *Pseudomonas syringae* pv. *lachrymans*) can also cause fruit lesions and rots. In addition to the pathogens discussed below, other fungi that can cause fruit rots include *Alternaria alternata* (Alternaria Rot), *Penicillium* species (Blue Mold), *Myrothecium roridum* (Crater Rot), *Pythium* species (Pythium Cottony Leak), and *Rhizopus stolonifera* (Rhizopus Soft Rot). In general, a 2- to 3-year crop rotation is recommended where fruit rots have occurred, as the pathogens survive on crop residues in the soil. Many of them can also be seed-borne, so buy certified disease-free seed from reputable sources or use fungicide treated seed when possible. For other chemical recommendations please see the New England Vegetable Management Guide.

Phytophthora Fruit Rot (*Phytophthora capsici*) Perhaps the most serious fruit rot in wet years, *Phytophthora* infection begins as a water-soaked or depressed spot, most often on fruit undersides which are in contact with the soil. The pathogen produces a white, yeast-like growth that contains many fruiting bodies (sporangia) and affected fruit may be completely covered. The disease can develop and spread rapidly with excessive moisture and temperatures between 80-90°F. Entire fields may be destroyed. *Phytophthora* persists in the soil for many years; no effective crop rotation interval has been determined. **Management:** Manage soil moisture by sub-soiling, avoiding over irrigating, selecting well-drained fields, and avoiding areas of fields that do not drain well. Destroying diseased areas at the start of an outbreak can be effective in reducing the spread of disease. Planting pumpkins into cover crop mulch or following the biofumigant cover crop 'Caliente' mustard has shown promise in research trials. Pumpkins with hard, gourd-like rinds are less susceptible to *Phytophthora* fruit blight. 'Lil' Ironsides', 'Apprentice,' 'IronMan,' 'Rockafellow,' and 'CannonBall' have been reported as moderately-resistant. 'IronMan,' 'CannonBall,' and 'Rockafellow' also possess powdery mildew resistance.

Fusarium Fruit Rot (*Fusarium solani* f.sp. *cucurbitae*) Pumpkin fruits are attacked by *Fusarium* at the soil line, and the severity of infection varies with

soil moisture and the age of the rind when infection occurs. Surfaces of fruit that are in contact with the soil develop tan to brown, firm, dry and sunken lesions which may occur in concentric rings and remain firm unless invaded by secondary organisms. It can survive in seed but does not affect the germination or viability of the seed. *Fusarium* produces abundant resting spores (chlamydospores) in the soil, but only persists there for 2-3 years. Wounding is not necessary for infection to occur. Cultivars vary in their resistance with larger pumpkins being generally more susceptible. **Management:** Culling of unmarketable fruit can reduce the risk of spread during the post-harvest period.

Black Rot (*Didymella bryoniae*) Also called Gummy stem blight when it occurs on other plant parts, this disease produces a distinctive black decay. Initially, a brown to pink, water-soaked area develops in which numerous, black fruiting bodies are embedded. On butternut, symptoms may appear as a superficial, hardened, tan to white area which can develop concentric rings. Large Halloween pumpkins are more susceptible to black rot than smaller pie types. The pathogen is soil- and seed-borne and can overwinter in infected crop debris as dormant mycelium or chlamydospores. Wounding is not required for disease initiation, but wounding by striped cucumber beetles, aphid feeding, and powdery mildew infection all lead to increased susceptibility. **Management:** Crop debris should be plowed under promptly after harvest. Control of powdery mildew can significantly reduce black rot infection of pumpkins. Avoid chilling injury to winter squash and pumpkins in storage as this activates dormant black rot lesions and increases losses in storage. Store fruit at 50-55°F and ~60% relative humidity.



Anthracnose (*Colletotrichum orbiculare*) is common on the fruit and foliage of watermelons, squash, melons, and cucumbers in humid regions. Young fruit may turn black and die if their pedicels are infected, while older fruit develop circular, noticeably sunken, dark-green to black lesions which may exhibit a salmon colored exudate in moist weather. The pathogen is both seed- and soil-borne and can cause serious losses. Infected fruit may have a bitter or off-taste, in addition to lesions, and deteriorate quickly due to the invasion of secondary rot organisms. *C. orbiculare* survives between crops in infected crop debris, in volunteer plants, or weeds of the cucurbit family. The fungus does not require a wound to initiate infection and is spread by splashing water, workers, and tools in warm, humid weather. **Management:** Collect and burn or plow down deeply infected crop debris after harvest. Avoid wounding fruit during harvest and immerse fruit in a solution of 120 ppm chlorine after harvest.

Scab *(Cladosporium cucumerinum)* This pathogen attacks all parts of the plants, but is most serious because of the disfiguring scab lesions that develop on fruit. The disease is favored by heavy fog, heavy dews, light rains, and temperatures at or below 70˚ F. The spores (conidia) are borne in long chains, are easily dislodged, and spread long distances on wind. On foliage, the first sign of the disease is pale-green, water-soaked lesions which turn gray and become angular. On fruit, spots first appear as small sunken areas which can be mistaken for insect injury. The spots may ooze a sticky liquid and become crater-like as they darken with age. Dark green, velvety layers of spores may appear in the cavities and secondary soft-rotting bacteria can invade. Severity of symptoms varies with the age of fruit when it becomes infected. *C. cucumerinum* overwinters in infected squash and pumpkin

vines, soil, and may also be seed-borne. Spores produced in the spring can infect in as little as 9 hours, produce spots by 3 days, and produce a new crop of spores by 4 days. **Management:** Do not save your own seed if the disease is present. Select well-drained fields with good air circulation to promote rapid drying of foliage and fruit. During cool, wet weather fungicide sprays may not be entirely effective because of the rapid disease cycle.

Plectosporium Blight (*Plectosporium tabacinum)* Like Scab, Plectosporium Blight is most damaging when it appears on the fruit. Pumpkins, yellow squash, and zucchini are the most susceptible. Lens to diamond shaped, white to tan, lesions occur on stems, leaf veins, petioles, peduncles, while fruit lesions are more rounded. Severe stem and petiole infections can result in death of leaves and defoliation. Infected stems are dry and brittle. On fruit, the pathogen causes white, tan, to silvery russeting; individual lesions can coalesce to form a continuous scabby layer. In wet years, which favor disease development and spread, crop losses in no-spray and low-spray fields can range from 50 to 100%. No resistant cultivar of pumpkins has been reported and it has not been reported to be seed borne.

—M. Bess Dicklow, UMass Plant Diagnostic Lab

HARVESTING AND CURING POTATOES

Potato production has been increasing in recent years in Massachusetts. The 2012 Ag Census showed an almost twofold increase in both acreage (from 2,616A to 3,898A) and the number of farms growing potatoes (from 205 to 425) since 2007. This increase includes large farms that focus solely on potato production (>1,000 acres) as well as diversified farms. No matter the scale, harvest and curing principles remain the same. Storage will not improve the quality of tubers, so harvest when environmental conditions are ideal and pay careful attention to pre-harvest preparation to ensure that the highest quality potatoes come out of the field. The following is a checklist to help get potatoes into the holding phase of storage–more details on storage will follow in a later issue of Vegetable Notes.

Optimum Environmental Conditions for Harvest

As cooler weather approaches, conditions become favorable for harvest and curing potatoes for long term storage. Optimum environmental conditions for harvest include tuber or air temperatures of 50-60°F and available soil moisture content of 60-65% so that soil clods are not so hard that they damage skins as they are being dug but not so moist that they remain stuck to potatoes as they are brought into storage. Temperatures below 45°F will increase tuber bruising and temperatures above 60°F can increase transpiration and drying of potatoes or development of disease in storage. Vine-kill should take place about 2-3 weeks before these environmental conditions are expected. This year, planting dates varied widely because of our funny spring, and many early fields have been killed already or vines have died back early due to drought stress or hopperburn.

Pre-harvest Preparation

- **Maturity** is indicated by the ability of the tuber to resist skinning during harvest. Periodically dig a few plants to see how easily the skins peel as they are being dug. Sugar content is a maturity index for processing potatoes, with both immaturity and over-maturity resulting in higher sugar levels. Mature potatoes resist bruising and have lower respiration rates.
- **Vine killing** stops tuber growth at the desired size after bulking, stabilizes the tuber solids, controls hollow heart disorder, promotes skin set and allows for easier digging and harvesting. Vines may have died down naturally but if they are still green, mow or use a vine desiccant to kill the plants once tubers are mature. Killing vines also reduces the risk of late blight causing tuber infections, as the pathogen requires a living host to grow and produce spores.
- **Skin set** is achieved by allowing two to three weeks for tuber skins to mature in the field after vine kill. During this period, suberin is produced causing the outer skin, or phellem layer, to bind more tightly to the periderm layer–this creates a tough, durable skin. Most tuber diseases require a wound to infect potatoes – since the phellem layer is made of a brick shaped cellular matrix with no intercellular spaces, pathogens cannot penetrate the skin easily. Good skin

set greatly reduces the amount of wounding at harvest and increases the storability of tubers.

Harvest practices to prevent wounding and bruising: Check harvesting and transporting equipment before harvest begins, to make sure it is working properly and does not bruise or wound tubers, and continue to inspect during harvest to determine injury points. Potatoes should not drop more than 4" to 6" and all equipment surfaces should be padded. Replace bare chain with rubberized links where possible except for the primary chain. Adjust chain and ground speed so that chains are loaded to full capacity during harvest, and potatoes will 'flow' rather than drop from one chain to another. In many cases, increasing ground speed helps to achieve this. Adjust the digger blade so that potatoes flow on to the upper surface of the chain rather than bumping into the front. Weed control prior to harvest is important so that digger blades can penetrate the soil more easily which reduces tuber bruising. Sharpen digging blades before harvesting.

Curing: The curing period, also known as suberization or wound healing, is one of the most critical storage phases lasting 2-3 weeks. The curing period is also essential for completing skin set.

- **Maintain temperatures in the range of 50-60°F**, and harvesting when pulp temperatures are in this range is ideal. The ability to move from field to curing temperatures will depend on storage ventilation systems, varieties, availability of cooling air, and humidity controls. If potatoes are harvested during hot weather and cool off slowly, the likelihood of storage rot is increased. If active refrigeration is available, potatoes can be harvested at 62 to 65°F pulp temperature and cooled effectively. Storage areas with no refrigeration should not be loaded with potatoes with a pulp temperature above 60°F.
- **Maintain relative humidity at 85-95%.** Low relative humidity will result in poor suberization, through which a starchy layer is deposited over any bruises or wounds, preventing healing. During the curing phase, tubers will lose moisture through cuts and bruises and also because tubers will still be respiring. As much as 2-4% of the tuber weight can be lost in the form of water during the first month after harvest. If managed properly, this water loss can be minimized and, if captured, this lost moisture can be used to maintain the high relative humidity needed during wound-healing and curing for 3 to 6 hours per day. A humidifier can also be used to maintain the ventilating air at a relative humidity of 95%.
- **Uniform air movement is necessary** to remove heat from the field and from respiring tubers, to supply oxygen, and to prevent condensation within the pile. Monitor temperatures within the tuber bins or pile to avoid heat buildup which increases tuber rot. In a through-the-pile forced air ventilation system, fans should be operated minimally, usually only 1 to 2 hours per day provides sufficient oxygen but minimizes moisture loss.
- **Curing and storage must take place in the dark** since even low light levels can cause development of chlorophyll (greening) and bitter, toxic, glycol-alkaloids that render tubers unmarketable. One to two weeks in low light can result in greening, and higher light levels cause faster greening.

Curing may be accomplished within the space that will be used for storage, or in a different location. Diversified farms and those who are in the process of building up their fall/winter storage infrastructure may find it more challenging to provide the appropriate conditions for curing. On a small scale (up to about 1100 cubic feet), curing can be accomplished using a Cool-bot and humidifier in an insulated space. A combination of vents and fans to exhaust warm air and bring in cool air, controlled with relative humidity and temperature sensors, can make best use of outdoor conditions to manage the indoor environment. Good environmental control is very difficult in an open barn situation.

When tuber quality is poor. Potatoes affected by freezing injury, Pythium leak, late blight or soft rot will break down at normal curing temperatures. If this is the case, eliminate the curing period–grade out the rot and sell immediately, or cool rapidly to 45°F with low to medium relative humidity. Questionable potato lots should be harvested closer to 55° F if they must be stored. Freezing occurs at 30°F, but chilling injury can occur after a few weeks at 32°F.

Disease management: Late blight spores can be carried by rainwater onto tubers and cause problems in storage, though not this year since it is not here! The pathogen can only survive on live tissue, hence vine kill is key in disease management if late blight is present on the foliage. If black scurf (*Rhizoctonia* spp.) or silver scurf (*Helminthosporium solani*) are present, they will increase in severity as long as tubers remain in the soil. Wireworms can also cause tuber damage. If markets are ready or suitable storage space is available, avoid these diseases and pests by starting harvest as soon as skins are set.

If the soil is wet during harvest, soil may adhere to the tubers and promote infection by soft rotting organisms. Potato fields that have been saturated with water will be especially prone to post-harvest diseases. Bacterial soft rot (*Erwinia* spp.), *Fusarium* dry rot, pink rot (*Phytophthora erythroseptica*), and *Pythium* leak are four serious tuber rotting pathogens that cause the most significant losses in storage (see Potato Tuber Diseases in August 20, 2015 Vegetable Notes). 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! Send samples to the UMass Plant Disease Diagnostic Lab (413-545-3209) to get an accurate diagnosis as different tuber blights need different management and proper identification will allow for better management practices and prevention next year. Grade out diseased tubers *before* storage as much as possible. The longer they are mixed with healthy tubers, the higher the chance of disease spread.

Sterilizing Storage: An important aspect of potato disease control in storage is to provide a pathogen-free environment. All storage and potato handling surfaces should be thoroughly cleaned and disinfected prior to putting the crop in storage. Surfaces should be well moistened with disinfectant spray. Spray bin walls until there is a slight runoff. Recommended disinfectants are quaternary ammonium compounds such as Hyamine 2389. Bins or equipment treated with quaternary compounds must be rinsed with clean water before coming into contact with potatoes to be used for human consumption. Read labels carefully regarding use on walls or floor versus use on 'food contact surfaces' and to determine suitability for your needs. Organic produce may not come in contact with surfaces that have been treated with quaternary ammonium compounds. Chlorine, ozone, and peroxyacetic acid are approved disinfectants for organic produce.

Sprout inhibitors may be needed, depending on storage goals, storage conditions, and cultivar. Potatoes harvested in warm temperatures will be more likely to sprout in storage. Later maturity varieties usually have a longer period of dormancy (2-3 months).

Cooling and Storage After the curing period, cool tubers as soon as possible but gradually and steadily to the holding temperature. Ideal holding conditions are as follows: 80-90% relative humidity and 38-40°F for table-stock and seed potatoes, 45-50°F for chipping, and 50-55°F for French fry stock.

Stay tuned for a later issue of Vegetable Notes with more details on storage.

-- K. Campbell-Nelson, M.B. Dicklow, and R. Hazzard

A QUICK GUIDE TO STANDARD OPERATING PROCEDURES

Proper farm sanitation procedures are critical to keeping food safe from farm to table. There are many steps farmers can take in order to decrease food safety risks on-farm. One way to reduce the risk of produce contamination, while simultaneously improving product quality and consistency, is by implementing formal Standard Operating Procedures (SOPs) for equipment and facilities.

Standard Operating Procedures (SOP) are written documents which formally describe steps of a processing operation, providing training and guidance for employees. They also help to increase farm safety and food quality by documenting operations as a reference checklist, providing assurance that proper techniques have been followed.

It is encouraged to use SOPs for all process operations, but they are especially important for high risk processes. Cleaning and sanitizing of implements and equipment, produce washing and/or soil amending are considered high risk processes and it is recommended that these processes are carefully managed to ensure proper food safety management. Sanitation SOPs (SSOPs) are standard operating procedures specifically for sanitation practices, and are recommended for post-harvest facilities equipment (brush washers, tables, produce wash basins, etc.) and tools (totes, scissors, knives, etc.). Failure to establish consistent, safe methods for sanitizing these items is especially risky, and can result in low quality produce or a food-borne illness outbreak.

Key components of creating an SOP are: providing complete, detailed steps for the selected process, verifying the process and reviewing the procedure outlined in the written SOP, and including the title, author, implementation, and revision dates on a standardized SOP template. The template should include both the process' step-by-step procedure, and documentation of successful completion. This allows employees to refer to the procedure to refresh their memory, thus maintaining consistency, and provides written proof that the process was implemented in an acceptable manner.

The beneficial effects of SOPs are numerous, as they serve to:

Train employees on tricky or detailed operations,

Improve operational efficiency, and

Improve product consistency, safety and quality.

Creating and following SOPs will reduce safety risks for products and employees and increase the efficiency of your operations.

Examples of SOP templates can be found at:

https://ag.umass.edu/sites/ag.umass.edu/files/sop_chlorine_bleach_a_0.pdf

http://gaps.cornell.edu/sites/gaps.cornell.edu/files/shared/documents/logsheets/Production%20Water-SOP.docx

http://gaps.cornell.edu/sites/gaps.cornell.edu/files/shared/documents/logsheets/Postharvest%20Water-SOP.docx

http://gaps.cornell.edu/sites/gaps.cornell.edu/files/shared/documents/logsheets/Soil%20Amendments-Log-Soil.docx

Be sure to check out these instructional videos from University of Massachusetts, University of Vermont, and University of Connecticut extension programs:

Standard Operating Procedures: http://bcove.me/w0exp7xn

Clean Greens: SOP for Triple Rinsing Greens: http://bcove.me/0fjtoipy

Cleaning vs. Sanitizing: http://bcove.me/rgnhuidy

Knowing How to Clean and Sanitize: http://bcove.me/h0k4r5c9

In the next issue of Veg Notes, we'll tell you about our study on how to properly sanitize a produce brush washer, with a template SOP based on our results.

-by Kelsi Harper, undergraduate student, UMass Food Science Department

Events

The 32nd Annual Massachusetts Tomato Contest

When: Wednesday, August 24th, from 9am-1pm

Where: Boston Public Market, corner of Congress St. and Sudbury St. Boston, MA

The contest will be held in the KITCHEN at the Boston Public Market (entrance is on the corner of Congress St. & Sudbury St.). Tomatoes will be judged by a panel of experts on flavor, firmness/slicing quality, exterior color and shape. Always a lively and fun event, the day is designed for commercial growers with the goal of increasing awareness of locally grown produce. The 32nd Annual Tomato Contest is sponsored by the Massachusetts Department of Agricultural Resources, New England Vegetable and Berry Growers Association and Mass Farmers Markets in cooperation with the Boston Public Market and The Trustees of Reservations.

For more information or questions regarding the Tomato Contest contact Julia.Grimaldi@state.ma.us, 617-626-1763.

SARE Grant Webinars

Writing a Northeast SARE Partnership Grant Application Webinar

When: Sep 01, 2016 11:00 AM EDT

Register at: https://attendee.gotowebinar.com/register/3512176966032896002

In this 60-minute webinar, Carol Delaney, Northeast SARE Farmer Grant specialist, will review the Partnership Grant program, including its purpose, allowable expenses, and funded project examples. She will also provide tips to writing a compelling application. The webinar is open to the public, especially to non-profit organization staff and others interested in applying.

Northeast SARE Farmer Grant Program: Tips for Writing a Compelling Application

When: Sep 01, 2016 12:30 PM EDT

Register at: https://attendee.gotowebinar.com/register/3376350996119085058

In this 60-minute webinar, Carol Delaney, Northeast SARE Farmer Grant specialist, will review the Farmer Grant program, including its purpose, allowable expenses, and funded project examples. She will also provide tips to writing a compelling application. The webinar is open to farmers, agricultural service providers, and others interested in learning about Northeast Farmer grants.

Twilight Meeting: UMass Vegetable Research

When: Wednesday, September 14, 2016, 4pm to 6pm

Where: UMass Research and Educational Farm, South Deerfield, MA

Come join us at the UMass Research Farm to hear about current applied research projects being conducted by UMass Extension faculty, students, and staff and with the UMass Student Farm Enterprise. Topics will include:

- Best management practices for on-farm food safety (Standard Operating Procedure for sanatizing a Produce Brush Washer, The development of a triple wash leafy green SOP, Development of an on-farm food safety plan, DIY Mobile Wash Station, Produce Wash Efficacy in a Hydrocooler unit) Amanda Kinchla & Amanda Brown
- Cucurbit downy mildew management using resistant cucumber varieties, Susan B. Scheufele
- Alternative Management Strategies for Cabbage Aphids, Susan B. Scheufele
- Tomato variety trials, Levi Lilly

Managing Phosphorus in Organic Residuals Applied to Soils

When: Wednesday, November 2, 2016 from 8:45-4pm

Where: Holiday Inn, 265 Lakeside Ave.Marlborough, MA 01752

How do we develop a balanced system for use of organic residuals, with all their benefits, without adding to negative environmental impacts caused by phosphorus (P) leaching and runoff? This symposium will provide technical, research-based information and dialogue on the presence, forms, dynamics, transport, and fates of P applied to soils in organic residuals such as composts, biosolids, manures, and digestates from anaerobic digestion. This symposium is intended to help in developing guidelines for the use of P-containing organic residuals in accordance with nutrient management regulations.

Approval has been requested for the following professional certifications: CGCS, CSFM, MCH, MCLP, and AOLCP.

Event Website: https://www.regonline.com/phosphorus

Contact: Kelly Kraemer, 413-545-5221, kkraemer@umass.edu

Sponsors

Vegetable Notes. Katie Campbell-Nelson, Lisa McKeag, Susan Scheufele, co-editors.

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