UCONN
COLLEGE OF AGRICULTURE, HEALTH AND NATURAL RESOURCES
EXTENSION

Welcome to this week's pest alert!

A quick look outside…

Continuation of the markedly wet growing season can result in flooding and pooling of rainwater in farm fields, leading to increased instance of pathogenic infection. But never fear—there are strategies to help mitigate the effects! Raised beds, like the ones shown above on a farm in East Granby, can be implemented to avoid excess soil saturation of planted areas.

What to be on the lookout for…

MEXICAN BEAN BEETLE

Photo 1: MBB larva (top) and adults with feeding damage (bottom).

Mexican bean beetle (MBB) larvae and adults were found in significant populations in field beans in East Granby this week. MBB feed heavily on foliage, creating "lacy" damage, and can cause defoliation and severe reductions in yield.

There are up to 3 generations per year, with newly emerging adults moving to the next succession planting of snap beans. A life cycle may be completed in 30-40 days during the summer. Prompt destruction of crop residue after harvest helps lower overwintering populations. Avoid continuous production of beans in the same or adjacent fields year after year.

For protected or indoor plantings, biological control is an option. *Pediobius foveolatus* is a parasitic wasp species that can be released and will "sting" the larvae of MBB, laying eggs inside. Timing is critical—release of the wasp must be done when MBB larvae are beginning to hatch.

For field crops that are not protected, insecticide applications may be warranted if a threshold at or above 15% damage is reached. Pyrethrins (PyGanic), Azadirachtin (Azatin), combination of those as a tank mix, a pre-mixed formulation (Azera), or petroleum oil (Suffoil-X) are some effective options that can be used in organic systems. For conventinal systems, acetamiprid (Assail 30 SG) dimethoate and lambda-cyhalothrin (Worrior II) are some additional spray options.

CROSS-STRIPED CABBAGEWORM

Photo 2: CSC larva and feeding damage.

Cross-striped cabbageworm (CSC) caterpillars were confirmed in a brassica planting. CSC is most abundant in late-season plantings and can cause significant damage. Spray is warranted if an infestation is at or above 5% of all plants. Scout plantings weekly by checking the underside of leaves for eggs and larvae.

The *Bacillus thuringiensis* (*Bt*) spray is effective in controlling insect larvae and is allowed in organic production. There are many *Bt* products available that are labeled for use on brassica caterpillars such as

XenTari and Dipel which can be rotated for resistance management. Use of spreader-sticker improves the efficacy of these pesticides in brassica crops. Cyclaniliprole (Harvanta) and methoxyfenozide (Intrepid 2F) are some additional options for conventional growers.

BRASSICA FLEA BEETLE

Brassica flea beetles were observed in a young planting of bok choy. Infestation can happen very quickly, and damage is often severe and can render crops unmarketable. Covering brassica crops with row cover before infestation is an effective means of exclusion if implemented correctly and at the right time. The edges of the row cover must be secured tightly with sand bags or soil and installed promptly after transplant.

Photo 3: Brassica flea beetle and feeding damage. Photo: Utah State University Extension

Flea beetles overwinter in remaining crop debris and field edges. Removal or incorporation of crops immediately after harvest will reduce overwintering capacity. Rotate away from infested areas for spring plantings.

Several pyrethroids, neonicotinoids, carbamates, and diamides are available and labeled for flea beetle in brassicas. These synthetics may be considered once flea beetles are present.

BLACK ROT OF BRASSICA

Black rot of brassica (distinct from black rot of cucurbit) is caused by *Xanthomonas campestris* pv. *campestris* bacteria. Symptoms include the trademark yellow "V-shaped" lesions, with blackened veins within lesions. Infection can spread quickly and lead to high yield losses. Infections are seedborne, so selecting certified disease-free seed is important! Hot water seed treatment is also an option to reduce instance of infection. UConn currently offers hot water seed treatment for black rot in brassicas, amongst other things—see the table on their webpage for a list of eligible crops.

Photo 4: Black rot lesion on a broccoli leaf.

Once infection is confirmed, rotate away from brassicas for 3 to 4 years. Chemical controls include fluxapyroxad plus pyraclostrobin (Priaxor Xemium), iprodione (Rovral 4F) **(broccoli only)**, potassium bicarbonate (MilStop^{OG}), pyraclostrobin (Cabrio EG), and thiram (Thiram

42-S). See this section of the New England Vegetable Management Guide for more information.

CERCOSPORA LEAF SPOT OF BEET

Cercospora leaf spot (CLS) can affect beets, swiss chard, or spinach, and is caused by the fungus, *Cercospora beticola*. The intial symptoms are small lesions on leaf tissue that eventually coalesce into large necrotic areas and cause defoliation. *C. beticola* can survive in seed, soil, or overwinter in crop debris and alternate hosts (weeds, overwintered Chenopodiaceae crops).

Cultural practices for management of CLS includes incorporation of any crop debris after harvest and elimination of alternate hosts between growing seasons, using fungicide-treated seeds, and rotating away from host crops for 3 years.

Chemical management includes conventional and organic fungicides. See this section of the NE Vegetable Management Guide under "Leaf Spots and Blights" for more detailed information.

Photo 5: Cercospora leaf spot lesions on beet leaves.

PLECTOSPORIUM BLIGHT OF CUCURBIT

This is a relatively new disease of cucurbits, having been discovered in the U.S. in the 1980s. Since then, it has become a prominent disease to look out for. It is caused by the fungus *Plectosporium tabacinum.* Development is favored by rainy weather, and symptoms often begin 7-10 days after a precipitation event. Symptoms include diamond-shaped white spots on petioles, vines, leaf blades, and fruit that coalesce and kill large portions of the plant.

Fungicide applications are an effective way to control Plectosporium blight. Scout cucurbit fields for presence of the disease and spray when it first occurs.

Photo 6: White, diamond-shaped lesions of Plectosporium blight.

SWEET CORN PESTS

Corn earworm (CEW) numbers are down from last week. Trap count at a farm in Shelton averaged 0.25 CEW moth per night and trap count at a farm in Berlin averaged 0.5 CEW per night keeping both farms at 6-day spray schedule.

Continue to be on the lookout for the following pests that were covered in the previous pest alerts (2023):

- Cabbage root maggot
- Damping-off
- Onion maggot
- Botrytis leaf blight
- Cucurbit powdery mildew
- Cucurbit downy mildew
- Allium leafminer
- Phytophthora blight, root rot and crown rot
- Alternaria leaf spot on brassica crops
- Pepper and tomato anthracnose
- Verticillium wilt in eggplant and tomatoes

PUMPKIN & WINTER SQUASH HARVEST, CURING & STORAGE

Written by G. Higgins and R. Hazzard, compiled 2018 from resources by Brent Loy, late researcher emeritus, New Hampshire Agricultural Experiment Station, and professor emeritus of genetics, UNH. Originally published in the September 14, 2023 Vegetable Notes.

Pumpkins and winter squash—at least those that didn't succumb to Phytophthora or other diseases—are being harvested now. Correct harvest timing, curing and storage conditions can significantly affect eating quality, storage length and postharvest disease.

Harvest Timing for Winter Squash and Pie Pumpkins: For winter squash and pie pumpkins, harvest timing determines the flavor and texture of the fruit. As squash fruits grow, they accumulate starch, which is then converted into sugar in the field and during storage. The balance of starch (texture) and sugar (sweetness) in a squash determines the eating quality. Squash is mature when seeds are completely filled. If squash is harvested before it is mature, the fruit will use starch reserves from the flesh to fill the seeds, resulting in poor flesh quality. Immature squash will also not have enough starch to convert into sugar later on.

Most squash varieties are mature and ready to harvest 50-55 days after fruit set, or days after pollination (DAP). In many varieties, this is many weeks after the fruit turns a marketable color, which can be misleading. Dr. Brent Loy, late researcher emeritus at the NH Ag Experiment Station, said that days to maturity listed in seed catalogs are often incorrect, especially for acorn squash; catalogs often state 70-76 days to maturity (from time of seeding) when in reality it's more

like 90-100 days to maturity. It's not necessarily easy to keep track of fruit set, so there are some other indicators that squash is ready for harvest—see the end of this article for more information about specific types of squash.

Harvest Timing for Pumpkins: Since the pumpkin market lasts from Labor Day to Halloween, pumpkins may need to be held for several weeks before they can be sold. One factor in deciding when to harvest is the condition of the vines. Intact foliage protects fruit from the sun, and when vines and foliage die down from powdery or downy mildew, fruit can get sunscald. Foliar diseases, especially powdery mildew, can also reduce the quality of pumpkin handles, leading to reduced marketability for jacko-lantern pumpkins. As cooler fall weather approaches, the other major factor in deciding when to harvest is avoiding chilling injury. Chilling hours accumulate when squash or pumpkins are exposed to temperatures below 50°F in the field or in storage. Injury increases as temperature decreases and/or length of chilling time increases. This is particularly important for squash headed into long-term storage.

There can be extra work involved in bringing fruit in early and finding good storage locations, especially for growers who normally have pick-your-own harvest. Ideally, pumpkins would be harvested as soon as crops are mature and stored under proper conditions. Proper curing and storage conditions are key for pumpkins in particular, because improper conditions can result in handles shrinking and shriveling, making the pumpkins unmarketable. If you need to hold fruit in the field for pick-your-own or any other reason, using a protectant fungicide (e.g. sulfur, oil, or chlorothalonil) along with one of the targeted powdery mildew products can help protect from black rot, powdery mildew, and other fungal fruit rots. For information on identifying and controlling fungal fruit rots of winter squash, see the September 3, 2020 issue of Veg Notes. Scout for insects feeding on the fruit and handles, which may include squash bug nymphs and adults and striped cucumber beetles, and control them if damage is evident. See the Pumpkin, Squash, & Gourds insect control section of the New England Vegetable Management Guide for treatment recommendations.

Harvest: Despite their tough appearance, squash and pumpkin fruit are easily damaged. It is important to avoid bruising or cutting the skin during harvest. Once the rind is bruised or punctured, decay organisms will invade the fruit and quickly break it down. Place fruit gently in containers and move bins on pallets. Use gloves to protect both the fruit and the workers. For some squash, especially butternut, stems can be removed to prevent them from puncturing adjacent fruit during harvest and storage. If stems are removed, allow the stem scars to heal before putting into storage (see Curing below).

Curing: For some squash types (e.g. acorn and delicata), the mature fruit can be eaten immediately after harvest. Other squash types (e.g. butternut, hubbard, kabocha), need time to convert starches to sugars and must be cured or stored for a specific amount of time before they are eaten.

Curing speeds up the conversion of starches to sugars so that squashes reach optimum eating quality sooner. It also causes fruit skin to harden and accelerates wound healing to prevent disease development. Cucurbita maxima and moschata squash varieties can be cured to hasten market readiness. However, curing is not always necessary: if you

are planning to store squash for a few months before selling, and the fruit is free of wounds, it should have sufficient time to convert starches to sugars and can go directly into storage conditions without the extra boost. Cucurbita pepo squash types are ready to eat at harvest (if harvested when mature!) and curing can actually reduce their storage lifespan.

To cure squash, store it for a short period of time (5-10 days) at a high temperature (80-85°F) and 80-85% relative humidity immediately after harvest. This can take place in the field if weather allows (night temperatures should not drop below 60°F), or in a well-ventilated barn, greenhouse, or high tunnel.

Storage: Pumpkins and winter squash should be stored in a cool, dry, well-ventilated area. Store fruit at 50-60°F with 50-70% relative humidity. Chilling injury is possible at temperatures below 50°F, and long-term storage at temperatures above 60°F will result in weight loss due to increased respiration rates. Large fluctuations in temperature favor condensation on fruit within the bin, which encourages disease. Therefore, fruit temperature should be kept as close to the temperature of the air as possible to avoid condensation and fruit rot. Relative humidity above 70% provides a favorable environment for fungal and bacterial decay organisms, and relative humidity below 50% can cause dehydration and weight loss. In a greenhouse, temperature can be managed with ventilation on sunny days; heaters will be needed for storage into November and beyond. An inner curtain can reduce heat loss and cost.

Storage life depends on the condition of the crop when it comes in and your ability to provide careful handling and a proper storage environment. All fruit placed in storage should be free of disease, decay, insects, and unhealed wounds. See the end of this article for maximum storage times for different types of squash. Fruit that has been exposed to chilling temperatures (below 50°F) will not store well and should be marketed first.

Few farms have the infrastructure to provide ideal postharvest conditions for all of their fall crops. Fortunately, finding a method that is ‘good enough’ often does the job. Even if it is difficult to provide the ideal conditions, storage in a shady, dry location, with fruit off the ground or the floor, is preferable to leaving fruit out in the field.

Harvest timing and storage needs for different squash types:

- ***Cucurbita pepo*** **(acorn, delicata, sweet dumpling, some pie pumpkins):** Acorn squash turns dark green 2-3 weeks after fruit set, which is 40-50 days before it should be harvested. Because acorn squash can be marketed as soon as it turns dark green, regardless of eating quality, many acorn varieties will never accumulate enough starch and will therefore never be sweet. The variety ‘Honey Bear’ was developed by UNH and has high sugar content at harvest. Harvest C. pepo squashes when the ‘ground spot’ (the part of the squash that lays on the ground) is dark orange. Pie pumpkins should be harvested when the skin is fully orange. These varieties can be eaten at harvest and will store for 2-3 months. They should not be cured, because it can reduce their lifespan in storage.
- ***Cucurbita maxima*** **(kabocha, hubbard, buttercup)**: Stems become dry and

corky when the fruit is ready to be harvested. These are more susceptible than other squash to sunburn and so if vines go down from disease, they should be harvested early (40 DAP), cured, then stored at 70-75ºF for 10-20 days to achieve acceptable eating quality. These have high starch content at harvest and so need to be stored for 1-2 months before being eaten, with the exception of all mini-kabochas and all red-skinned kabochas, which can be eaten at harvest. They will store for 4-6 months.

- ***Cucurbita moschata* (butternut, some edible pumpkins):** Butternut will turn tan 45 DAP but should not be harvested for another 2 weeks. Mini-butternut can be eaten at harvest and will store for 3 months. All others should be stored 1-2 months before eating to allow for starches to be converted into sugars and will store for 4-6 months. Carotenoid, the pigment that gives squash its yellow/orange color, also increases in storage for these squash, giving them more color and making them more nutritious.

Additional information:

- Eating Quality in Winter Squash and Edible Pumpkins
- Maximizing Yield and Eating Quality in Winter Squash - A Grower's Paradox
- Managing Winter Squash for Fruit Quality and Storage

Thanks for reading, and happy planting!

This report was prepared by Shuresh Ghimire and Maggie Ng, UConn Extension. All photos in this publication are credited to UConn Extension Vegetable IPM Program unless otherwise noted.

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