

### Cercospora leaf spots on beets

Symptoms occur as numerous, initially small circular leaf spots. Spots have a pale brown to off-white center with a red margin. Lesions expand in size, coalesce, turn gray as the fungus sporulates, and can result in extensive loss of foliage. Leaves at the center of the plant are often less severely affected. It survives between crop cycles in residues from infected crops (as sclerotia), in weed hosts, and on seed. It can survive in the soil for up to two years.



Photo: S. Ghimire

The pathogen is favored by high relative humidity and temperatures between 75-85° F and is spread by rain splash, wind, irrigation water, insects, workers, and equipment. Leaf wetness during the night, even with dry conditions during the day, encourages disease. Successive plantings made close together can allow disease to move from one planting into the next.

Bury infected crop residues and destroy volunteer plants and weed hosts. Start with certified, disease-free seed, or treat seed with hot water or fungicides. Rotate to non-host crops (outside of the Chenopodium family) for 2-3 years. If disease is present, do a once-over cut rather than cutting chard or spinach for regrowth. Avoid planting succession crops close together. Avoid overhead irrigation if it will result in prolonged leaf wetness periods; irrigate mid-day when leaves will dry fully or use drip irrigation.

### Sweet corn pests:

Corn earworms are still present at moderate numbers, but European corn borers and fall armyworm are winding down. The trap capture this week at a farm in Berlin was 3 corn ear worm moths per night, 0 European corn borer IA, 2 NY and 1 hybrid moths per week. European corn borer will overwinter in infested corn stalks, so chop residues promptly after harvest is complete to reduce this overwintering population.

### **Pumpkin and winter squash harvest, curing and storage**

*This article was originally published in UMass Extension Vegetable notes, Vol 30, number 21. Written by G. Higgins and R. Hazzard, compiled from [Eating Quality in Winter Squash and Edible Pumpkins](#) and [The Nuts and Bolts of Fruit Quality in Cucurbits](#) by Brent Loy researcher emeritus, New Hampshire Agricultural Experiment Station and professor emeritus of genetics, UNH.*

Winter squash and pumpkin fruits that remain in the field face a daunting list of diseases, insects, and weather events that could threaten fruit quality. Once the fruit reaches maturity, prompt harvest and careful postharvest handling is generally preferable to leaving fruit in the field, particularly in a wet season. This is especially true if you know that your pumpkins or squash are in fields that were previously infected with Phytophthora blight, which can explode after a heavy rain.



*When defoliation exposes pumpkins to sunscald, it may be better to harvest them rather than leave them in the field. Photo: UMass Extension*

**Pumpkin harvest timing:** Since the pumpkin market lasts until 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 go down from powdery or downy mildew, fruit can get sunscald. Foliar diseases, especially

powdery mildew, can also reduce quality of pumpkin handles, leading to reduced marketability for jack-o-lantern pumpkins.

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. However, we recommend that growers harvest as soon as crops are mature and store under proper conditions, if it is feasible. 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. Scout for insects feeding on the fruit and handles, which may include squash bug nymphs or adults and striped cucumber beetle, and control them if damage is evident. See 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 Conditions below).

**Harvest timing for eating quality:** For pie pumpkins and winter squashes, harvest timing determines the flavor and texture of the fruit. Before understanding when the best time is to harvest squash, it's important to understand the difference between "mature" squash and squash that is ready to be eaten. As squash fruits grow, they accumulate starch, which is then converted into sugar both during maturation in the field and after harvest 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. 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 more time to convert starches to sugars and must be stored for specific amounts of time before they are eaten.

Most squash varieties are mature and ready to be harvested 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. According to Dr. Brent Loy, researcher emeritus at the NH Agricultural Experiment Station, days to maturity listed in seed catalogs are often in error, 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—see the end of this article for more information about specific types.

**Curing Conditions:** In some cases, squash needs to be stored for a short period of time (5-10 days) at a high temperature (80-85°F) and 80-85% relative humidity immediately after harvest, either in the field if weather allows, or in a well-ventilated barn, greenhouse, or high tunnel. Night temperatures should not drop below 60°F. These conditions will speed up the conversion of starches to sugars to achieve good eating quality earlier on and will allow fruit skin to harden and wounds to heal. You may not want to cure squash if it's destined for long-term storage and if it is free of wounds—squash in long term storage should have sufficient time to convert starches to sugars and can go directly into storage conditions without the extra boost. Squash types like acorn and delicata are ready to eat at harvest (if they're harvested when they're mature!) and only need to be cured if you want to store them and the skin is wounded.

**Storage:** Pumpkins and winter squash should be stored in a cool, dry, well-ventilated storage 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.

- ***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. UNH has developed two varieties, ‘Honey Bear’ and ‘Sugar Dumpling’, that both have 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.

- ***Cucurbita maxima*** (kabocha, hubbard, buttercup): Stems becomes 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 70-75°F 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 the more nutritious.

*This report is compiled by Shuresh Ghimire, UConn Extension.*

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