

## Production Information

### Harvest Helps

It's that time of year again when we get to enjoy the fruits of our labors. For all the new comers to gardening (and perhaps the seasoned veterans also), the following are guidelines of when to harvest your vegetables and some information on how to store them that may be helpful.

**Artichoke** harvest begins in late July or early August and continues until frost. Once the flower buds form, do not stress the plant. Harvest buds when they reach full size but before the bracts (bud leaves) begin to open. Cut off the bud with 2-3 inches of stem. Continue to water and feed the plants. Buds not harvested produce attractive purple blooms that can be used as centerpieces or dried and used in flower arrangements.



Artichoke buds ready for harvest (above) and a flowering artichoke (right inset)

**Asparagus** harvest begins 2 years after planting. Plants may be harvested for up to 4 weeks the first year. Cut 9 inch tall spears at ground level. Remove all emerging spears during harvest since tall growing spears suppress further spear growth. Harvest for 6-8 weeks from year 5. Stop harvesting when the majority of spears are smaller than a pencil in diameter.

**Beans.** Bush and pole beans are harvested before the pods are fully mature. Pods should be full size, with small seeds, and firm, crisp flesh when picked. Pods are ready for harvest

about 7-14 days after flowering. Pick regularly as the plant will flower and mature the pods for 2-3 weeks on bush varieties and for 5-6 weeks on pole types. Harvest and use immediately for best quality and flavor. Refrigerate if not used immediately.

**Beets** can be harvested as soon as the roots begin to size. Generally roots are mature 60-80 days from seeding, depending on variety. As the roots get larger they tend to get more fibrous. Use a digging fork to loosen soil and pull up needed plants by the tops and trim off leaves. Wash and store at 32°F and 95% relative humidity for 2-4 months. Young leaves may be cooked and eaten as well. Harvest beet leaves when they are 4-6 inches tall. Beets should be harvested before heavy frosts or freezes.

**Broccoli** heads should be harvested when the heads are compact but before the flower buds open. Mature heads are 6-12 inches in diameter and should be cut with stems 8-10 inches long. With additional water and fertilizer, broccoli will produce many 4-6 inch long side-shoots. Broccoli can be stored for 1-2 weeks at 32°F and 95% relative humidity.



Broccoli ready for harvest (left), over-mature broccoli (right)

**Cabbage** heads should be harvested when the heads reach full size and are firm and compact. Cut the stem below the head leaving 2-3 wrapper leaves for protection. Cabbage can be stored for 2-6 months at 32°F and 95% relative humidity. Avoid storing cabbage with apples, pears, or other ethylene producing fruits as bitter flavors will develop.

**Cantaloupe** requires 35-45 days to mature from flowering, depending on the temperature. Use the following guide to determine fruit maturity. The netting gets coarse and rough,  
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the stem breaks (slips) away from the vine easily, and the background color of the fruit turns from green to yellow (see photo). Pick melons as they ripen. Cantaloupe will store for 1-2 weeks if held at 45-50F.

**Carrots** can be harvested when the roots begin to size. Generally roots are mature in 70-100 days from seeding. Use a digging fork to loosen soil and pull up needed plants by the tops and trim off leaves. Wash and store the roots at 32°F and 95% relative humidity for 2-4 weeks. Plants can be left in the garden after light frosts. Many gardeners overwinter carrots in the garden under heavy mulches and harvest them as needed. Carrots can be stored in moist sand in a cool cellar for several months. Do not store carrots with apples or pears as the fruit gasses cause the roots to go bitter.

**Cauliflower.** As the head enlarges, it will discolor and develop bitter flavors if exposed to the sun. Blanch the head by tying the leaves together with strong twine or rubber bands when the heads are the size of silver dollars. This keeps the sun off the head and helps whiten them. Harvest the heads when they are fully developed (6-12 inches in diameter), compact and blanched white. Cauliflower can be stored for 3 weeks at 32°F.



Tying the leaves together (**Blanching**) helps keep the cauliflower head white and prevents bitter tasting cauliflower.

**Celery.** Harvest celery stalks by removal of the outer petioles when they are a foot or more in length. Whole plants are ready to use when they are 3 inches or more in diameter. The inner stalks are the most tender and taste the best uncooked. Celery harvested in hot, dry weather may be tough, stringy, and bitter. Store harvested celery in the refrigerator for up to 2 weeks.

**Cucumbers** are ready to harvest 5-7 days after flowering. Do not let fruits get too large as flavor decreases with age, seeds begin to mature and the skin gets tough. Handle carefully as fruits bruise easily. Pick regularly to encourage continual production. Cucumbers can be stored for 10-14 days at 55°F. If held in the refrigerator, fruits will break down rapidly and will yellow if stored near apples.

**Eggplant** is generally harvested when fruits are full size, have a glossy sheen, and are 6 to 8 inches long. Fruits that are firm, plump and fully colored, with smooth skin have the best flavor and quality. Use a knife or pruning shears to cut the stem when harvesting rather than twisting off the fruits. Wear gloves, as eggplant has small prickly thorns on the stems and under the leaves. Pick fruits as they mature. Mature eggplant will store for 7 days if held at 50-55°F. Fruits are subject to chilling injury if refrigerated. Over-mature fruits are dull colored, soft, seedy, and taste bitter. Eggplant is not suitable for canning or drying, but can be frozen.



Eggplants ready to harvest have a glossy sheen

**Garlic.** Harvest garlic when the tops begin to yellow and fall over, before they are completely dry. Carefully lift the bulbs with a spade or garden fork. Over mature bulbs do not store well. Place the entire plant in a shady warm spot to dry for 1-2 weeks. When fully cured the garlic skins should be papery and the roots dry. Carefully remove any excess soil from the roots and bulbs. Bruising the bulbs leads to rapid deterioration. Mature bulbs may be braided into garlic ropes or stored in open meshed sacks. For those bulbs stored in sacks, cut off the leaves about 1-2 inches above the bulb. Store garlic in cool (40F), dry conditions. Avoid freezing. The largest, best-formed bulbs may be used for the next fall planting.

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**Kale** should be harvested when the leaves reach full size. Older leaves are generally stripped off the plants first allowing the young leaves to continue to grow. Frosts help improve the flavor of the fall planted crop. Kale can be stored for 2-3 weeks at 32°F and 95% relative humidity. Many gardeners leave kale growing in the garden throughout the winter.

**Lettuce** can be harvested almost any time during growth. Crisphead lettuce should be harvested when heads are firm. Butterhead and cos lettuce are harvested when heads are in the early heading stage. Leaf lettuce may be picked anytime after leaves form, but before the seed stalk forms. Older leaves are often stripped off the plants first, allowing the young leaves to continue to grow. Lettuce can be stored for 1-2 weeks if refrigerated. Some gardeners grow lettuce hydroponically throughout the winter under artificial lights.

**Onions** vary in their maturity times. Green onions may be harvested as early as 50 days after seeding. Bulb onions generally require 100-120 days to mature. Leave bulb onions in the ground until the tops fall over. Once the tops fall over, lift the bulbs but leave them in the garden to dry for 2-3 weeks. The tops will help protect the bulbs from the sun. When fully cured the onion skin should be papery and the roots dry. Mature bulbs may be braided into onion ropes or stored in open meshed sacks. Cut off the leaves about 1-2 inches above the bulb. Onions store best in cold (32-40°F), dry conditions. Check regularly and use bulbs that are softening or sprouting first.



Allowing onion bulbs to dry after lifting (see above) helps prevent rots and other storage problems.

**Peas.** Snap peas are harvested before the pods are fully mature. Pods should be full size, with small seeds, and have firm, crisp flesh when picked. Snap peas are ready for harvest about 5-8 days after flowering. Pick regularly as

the plant will flower and mature the pods for 3-4 weeks. Garden peas are ready for harvest about 18-21 days after flowering. Pick the pods when the seeds are plump and shell before use. Use snap or garden peas immediately for best quality and flavor. Refrigerate if not used immediately.

**Pepper** fruits require 35-45 days to mature from flowering to full color (red, yellow, orange) depending on the temperature and variety. Fruits are generally picked green (immature) or fully colored (ripe). Fruits should be firm, plump, and smooth skinned for best flavor and quality. Pick fruits as they mature. At the end of the season, harvest all fruits that are mature green or colored slightly. Peppers will store for 1-2 weeks if held at 50-55°F. Fruits are subject to chilling injury so do not store for long periods in the refrigerator.

**Potatoes** can be harvested as soon as they begin forming (new potatoes) or as they mature. Determine the size of the tubers by digging into the side of the hills. Consume new potatoes quickly as they have thin skins and dry out rapidly. For storage potatoes, dig them after the vines have died, the tubers are full sized, and the skins are mature. Mature potato skins are difficult to remove when rubbed. Allow the soil to dry, brush it off, and do not wash the tubers until ready to use. Cure the tubers at 55-60°F with high humidity for 2-3 weeks after harvest. Curing helps heal any bruises or wounds that occur during harvest. After curing, store tubers in the dark at 40-45°F throughout the winter. Good air circulation will reduce rotting and sprouting. Do not store potatoes with apples or pears as the ethylene fruit produces will cause the tubers to sprout.

**Pumpkins** take 45-55 days to mature after flowering. Pumpkins are mature when they are fully colored, when the vine begins to die back, and when the rind is hard and impervious to scratching from a fingernail. Mature fruits should be harvested with the stem attached and stored where they will not freeze.



Mature pumpkins ready for harvest change color from green to orange.  
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**Radishes** can be harvested when the roots reach full size. Generally roots are mature 25-45 days from seeding depending on variety. Pull up plants by the tops and trim off leaves. Wash and store in plastic bags in a refrigerator for 2-4 weeks. Radishes should be harvested before heavy frosts or freezes.



Root size on radishes can be seen above ground and will help determine when to harvest the radish.

**Spinach.** Individual spinach leaves may be picked anytime before the flower stalk forms. Older leaves are often stripped off the plants first allowing the young leaves to continue to grow. Provided the growing point is not damaged, all leaves can be cut off to within 2 inches of the soil. Spinach can be stored for 1-2 weeks at 32°F and 95% relative humidity.

**Squash.** Summer squash take 35-45 days to come into flowering. Summer squash are generally harvested immature (3-5 days after the flower opens). If left on the vine longer, the skin begins to toughen and quality decreases. Handle carefully as the fruits bruise easily. Store at 45-55°F for 2-4 days. Winter squash take 45-55 days to mature from flowering. Use the following guide to determine maturity. Squash are mature when fruits are fully colored, when vines begin to die back, and when the rind is hard and impervious to scratching from a fingernail. Mature fruits should be harvested with the stem attached and stored in cool (50-55°F), dry conditions. Check fruits monthly for softening and rots. Buttercup and banana squash store longer than butternut and acorn squash.

**Sweet corn** ears mature in 15-24 days from silk emergence depending on the temperature. Ears are mature when silks are dry and brown. The husks should appear moist and green. Kernels in the tip of the ear should be plump and release milky juice when punctured. Ears can be

harvested over a 5-7 day period. For best quality and flavor, harvest and use immediately. To harvest, grasp the ear, snap downward while twisting the ear. Sweet corn can be stored for several days if refrigerated. Do not husk until ready for use.

**Tomato** fruits requires 25-35 days to mature from flowering depending on the temperature and variety. Pick fruit when they are fully colored but firm, for the best flavor and quality. Pick fruits as they ripen. At the end of the season, harvest all fruits that are mature, green or colored slightly. Store at 55° F and use as they ripen. Individual fruits do not need to be wrapped. Ripe tomatoes will store for 1-2 weeks if held at 50-55 degrees F. Fruits are subject to chilling injury so do not store for long periods in the refrigerator.

**Watermelon** fruits take 35-45 days to mature from flowering. Use the following guide to determine maturity. The curly tendril opposite the fruit should be brown and withered; the ground spot under the fruit changes from white to yellow; and the skin color changes from shiny to dull. Pick watermelons as they ripen. Watermelon will store for 1-2 weeks if held at 45-50°F.



The tendril near the top of the fruit is one indicator of maturity. A green tendril (left) indicates fruit is not ready, a dried tendril (right) is an indicator that the watermelon is ready to harvest.

For this information and more, see USU Extension publication; category: vegetables at the link below

<http://extension.usu.edu/htm/publications/by=category/category=194>

## Disease Information

### Blossom End Rot

Blossom-end rot is a non-parasitic disease affecting tomato, pepper, and watermelon fruit in Utah. This physiological disorder occurs due to a short-age of calcium in young fruit. Moisture imbalances or water stress aggravate the problem by interfering with calcium uptake in the plant.

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During the day, the pores on the leaves are open and water transpires from them drawing sap into the leaves. Since the fruit do not lose much water by transpiration, they receive little of the calcium-containing sap. At night, the leaf pores close, root pressure forces sap into the plant, and the developing fruit get their share of calcium and other nutrients. If the plant is water stressed at night, the system fails and the fruit receive very little calcium, causing blossom-end rot.

Excessive salts in the soil, including ammonium, potassium, and magnesium interfere with calcium uptake by plants and can result in blossom-end rot. Root damage caused by improper cultivation practices or excess soil water may also lead to blossom-end rot. The incidence of blossom-end rot varies with the variety and is greatly influenced by environmental conditions.



Blossom end rot symptoms on watermelon (left), tomato (center), and pumpkin (right).

The first symptom of the disorder is a slight, water-soaked discoloration on the blossom end (opposite of the stem) of the fruit. As the lesions enlarge, turning leathery and dark brown or black, they often become sunken into the fruit. Although the affected tissue is normally dry, bacteria and fungi may invade the lesion, producing a soft, watery rot.

Fruits are usually affected when about one-third or more grown, but the disease can occur during any growth stage of the fruit. Losses caused by blossom-end rot vary from negligible to severe.

### Management

To avoid blossom-end rot, use cultural practices that allow for proper uptake of calcium by the plant.

- Avoid water stress of fluctuating soil moisture by using infrequent, deep irrigation to keep the soil uniformly moist. Do not allow plants to be water stressed at night. The best way to maintain even soil moisture is by using organic or plastic mulch to prevent wide fluctuations in soil moisture.
- Avoid over-fertilizing; do not use ammonium-based nitrogen fertilizers.

- To avoid injuring roots, do not hoe or cultivate near plants. Pull weeds next to plants or use plastic mulch.
- Do not overwater, especially in heavy clay soils.

### Sunscald

Sunscald occurs on fruit that have been exposed to too much direct sunlight. Sunscald is often associated with plants that have leaf loss from a leaf spot disease or insect feeding, but can also be seen on plants that are over pruned. Affected areas are sunken, wrinkled and white in color. As the tissue dries, it becomes thin and papery and may get infected with secondary diseases.



Sunscald symptoms on pepper.

### Management

Maintain a good leaf canopy by properly balancing plant growth through pruning, fertilization, irrigation, and pest control. Appropriate plant spacing and regular nitrogen (N) applications ensures plants produce sufficient foliage to cover or shade the fruits which helps minimize sunscald. Row covers or shade cloths may also help shield fruits from direct sunlight.

Diseases such as powdery mildew can cause significant defoliation, so select plant varieties that show some level of tolerance to powdery mildew and other defoliating diseases whenever possible and manage diseases properly, especially during periods of high disease pressure.

Use caution when harvesting fruits so that leaves or stems don't get cut or broken. Damage leaves and stems can cause the remaining fruit to be exposed to the sun.

## Insect Information

## Insect Information

## Corn Earworm/Tomato Fruitworm

The corn earworm (also known as tomato fruitworm) can cause severe damage to corn, tomato, and other vegetables. The corn earworm adult is tannish brown moth. The front wings are marked with a distinct dark spot in the center and darker bands near the outer margins. The hind wings are lighter tan, with a dark band along the outer margins. Male moths have green eyes. Caterpillars range from about 0.1 to 1.5 inches in length and are brown-headed with green, brown, or black bodies. Alternating dark and light stripes run lengthwise on the body.

Corn earworms (CEW) overwinter in the soil as pupae

in warmer locations of the state and further south. Moths emerge in the spring and migrate or are blown into northern Utah. There are usually three flights, or generations, per year in northern Utah; four or more in southern Utah. The first is typically small. The second and third flights are much larger and occur during August and September, so continue to watch for them now.

Moths are active on warm, overcast evenings. CEW moths typically lay eggs on fresh, green corn silks, but will lay eggs on weeds and selected vegetables when corn silk is unavailable. When larvae hatch, they crawl down the corn silk and into the ear tip where they chew into developing kernels. Larvae will also chew on silks and leaves. After feeding 10 to 14 days, they will exit, drop to the ground, and burrow into the soil to pupate. After about 10 to 25 days, the CEW will emerge as an adult moth for a subsequent generation.

## Feeding/Damage

CEW causes direct damage by chewing into kernels near the ear tip and/or chewing on silks, decreasing pollination, and leading to poor ear-fill. Frass within the ear produced by feeding can reduce quality, storage life, and increase mold growth. Additionally, injury at the ear tip provides openings in the husk that can attract sap beetles and earwigs.



Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org



Eric R. Day, Virginia Polytechnic Institute and State University, Bugwood.org

Corn earworm damage on corn.

In tomatoes, CEW (tomato fruitworm) will complete its larval development inside fruit when present. Early stage larvae enter the stem end of fruit when it is between 0.75 to 2 inches in diameter. During development, caterpillars may emerge from one fruit and enter another. Their feeding results in a messy, watery, internal cavity filled with cast skins and feces. Damaged fruit will ripen prematurely. Late in the season, small larvae will also enter ripe fruit. Small larvae are difficult to detect and, thus, may be a problem in processing tomatoes for the canner. In fresh market tomatoes, any feeding results in unmarketable fruit that will need to be culled at harvest or in the packing shed.



Bruce Watt, University of Maine, Bugwood.org

CEW (tomato fruitworm) larva may feed on several fruits during its development causing damage as seen above.

## Management

In corn, place a clothes pin at the point where silk enters the ear. This helps keep worms out of ears, and should be done soon after the first silk emerges. Leave pins in place until the ear has filled and is ready for harvest. Use traps and lures when possible to monitor CEW populations. The net style *Heliothis* trap and a pheromone lure (used for baiting CEW traps) are useful tools for monitoring CEW. In places where pupae overwinter, till corn fields in the fall to decrease CEW survival in the soil.

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Management of CEW in tomato requires careful monitoring for eggs and small larvae. When control is needed, it is essential to treat before large numbers of larvae enter fruit, where they are protected from sprays. Trichogramma parasites and other natural enemies often destroy significant numbers of eggs, so it is important to check for parasitism and predation before making treatment decisions. Early-season processing tomatoes rarely need treatment. Late-season fields may be more seriously affected.

### Chemical Treatment Options

Good control in corn is dependent on applying insecticides before larvae enter the ears. Start spraying within two days of the beginning of silking, or as indicated by trap counts. About half of the eggs are laid within two days of silk emergence. Reapply insecticides to keep an active residue on new silk. Once silks turn brown, they are no longer attractive as egg laying sites. If you have any corn still in the silking stage, you can prevent corn earworm larvae from entering the corn by spraying (or rubbing) the silk with 1 part *Bacillus thuringiensis* (many brands) to 20 parts pure oil (mineral, corn, or soybean). Start this treatment when pollination is almost complete, which is when the silk tips have begun to wilt and turn brown.

In tomato, Spinosad (many brands) works well on lepidopteran larvae like the CEW (tomato fruitworm), but won't work on worms already within the fruit. If you are seeing these worms in tomatoes, start applying spinosad every 5-7 days through harvest. Focus on fruits higher up and on the outside of the plant where females prefer to lay eggs. Spinosad may be applied up to 1 day before harvest. Biological control and sprays of *Bacillus thuringiensis* and the Entrust formulation of spinosad are acceptable for use on organically certified produce.

### Stink Bugs

Stink bugs are the shield-shaped insects that can be green or brown in color. When disturbed, they can emit a foul odor. They are mostly found in weedy areas, and migrate out as weeds or field crops dry down.



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### Feeding/Damage

Feeding on tomato and pepper fruits causes a diffuse blotch that is whitish in color on green fruit, changing to bright yellow as the fruit ripens. The insect may probe in several locations, resulting in the cloudy appearance. On close inspection, you may see the pinprick-sized puncture wounds in the middle of the spots. Hard, whitish, callous tissue develops beneath the skin at the area of wounding.

On home-grown fruits, the discolored area and damaged tissue is superficial, and can be cut away to leave a still-edible fruit.



Stink bug feeding causes yellow/white blotches on the outside of fruits, while the tissue inside turns white and hard.

### Management

Stink bugs should be managed starting at the point when tomatoes reach 1 inch in diameter. The first step is to monitor for their presence. Stinkbugs can be difficult to monitor because they are very mobile, but you can look for them by shaking a plant over a tray and examine it for the fallen stink bugs (nymphs and adults). One stinkbug per plant could cause about 5-10% damage. If you opt for insecticide, cover vegetables thoroughly, as well as weedy areas.

### Chemical Treatment Options

**Commercial Growers:** Lannate (methomyl), Actara (thiamethoxam), Venom (dinotefuran), Surround (kaolin clay<sup>o</sup>); repels but does not kill), Sevin (carbaryl)

**Residential Growers:** kaolin clay, carbaryl (Sevin), pyrethrins (Natria Fruit and Vegetable, Monterey Bug Buster<sup>o</sup>), imidacloprid (Bayer Insect, Disease, & Mite Control)

#### Vegetable IPM Advisory

is published by Utah State University Extension

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