



Extend the Harvest by Properly Storing Fruits and Vegetable

Garden produce that is properly stored can help ensure the taste of summer in family meals for several months after the first frost, according to Karen Delahaut, former University of Wisconsin Extension Fresh Market Vegetable Horticulturist.

Whether harvested from your garden or purchased from the grocery or farm market, fruits and vegetables need to be stored properly for best quality. According to Delahaut, each harvested commodity has an optimum storage temperature. "Many fruits and vegetables should be stored only at room temperature because refrigerator temperatures (ideally 32°F to 40°F) damage them or prevent them from developing good texture and flavor. For example, when stored in the refrigerator, bananas develop black skin and lose sweetness, watermelons lose their flavor and deep red color if stored for longer than 3 days, and tomatoes lose flavor and become soft," says Delahaut.

Teryl Roper, UW-Extension Fruit Crops Specialist, agrees. Roper notes that apples, a crop commonly found in Wisconsin home gardens, can be stored for up to six months if properly stored. But proper storage depends on careful handling, says Roper. Most fruits and vegetables are easily bruised if not handled carefully. When harvesting, treat produce gently. Most produce should be washed after harvest and before storage, but there are some exceptions. Delicate berries should be rinsed in cold water just before consuming. Washing berries before storage will hasten the decay process. While potatoes store better with a fine layer of soil left on the skin, avoid leaving clumps of soil on potatoes as this will only encourage spoilage.

Several vegetables benefit from post-harvest curing, notes Delahaut. Curing heals or suberizes injuries from harvesting operations. It thickens the skin, reducing moisture loss and affording better protection against insect and microbial invasion. Curing is usually accomplished at an elevated storage temperature and high humidity. An enclosed home storage area with a space heater can provide the conditions effective for curing some crops.

Root crops such as beets, carrots, rutabagas, parsnips and turnips can be left in the ground into late fall and early winter. A heavy mulch of straw will prevent the ground from freezing so the roots can be dug when needed. Many people prefer the taste of these crops after they have been frosted because their flavors become sweeter and milder, notes Delahaut. But make sure to finish harvesting these crops before the ground freezes solid, or you'll have to wait until spring to dig them out, says Delahaut.

Following are some recommendations for handling some specific fruits and vegetables:

Potatoes: Late crop potatoes are best for long-term storage. After harvest, cure late potatoes by holding them in moist air for 1 to 2 weeks at 60 to 75°F. Lightly cover during curing to help retain moisture. After curing, lower the storage temperature to about 40 to 45°F, ideally in a cool, dark basement or cellar. Do not wash potatoes before they are put into storage and avoid chilling below 40°F. Store potatoes in the dark to prevent greening.

Onions: Harvest onions when the tops have fallen over and begun to dry. Cure onions after harvesting by spreading them in a single layer on screens in the shade or in a well-ventilated garage or shed for 1 to 2 weeks or until the tops are completely dry and shriveled. Trim tops back to 1 inch and store onions

in shallow boxes, mesh bags or hang in old nylons in a cold, dry well-ventilated room.

Garlic: Harvest garlic in mid-summer when the plant still retains 5 green leaves. Cure garlic in a warm, dry place with good air circulation for 1 month before cutting the tops and roots back. Hardneck garlic will store between 3-9 months while softneck garlic will store for 6-12 months or more.

Sweet and hot peppers: Mature, green bell peppers can be kept for 2 to 3 weeks if handled properly. Firm, dark green peppers free of blemishes and injury are best for storage. Harvest before frost to avoid damage to the fruit. Hot peppers are easiest to store after they are dry. Peppers can be dried by either pulling the plants together and hanging them upside down or by picking the peppers from the plants and stringing them together.

Tomatoes: With care, mature green tomatoes will keep and ripen for about 4 to 6 weeks in the fall. Harvest tomatoes from vigorous vines, tomatoes from nearly spent vines are more subject to decay. Harvest fruit just before the first killing frost. To store, pick tomatoes and remove the stems. Reduce rot by disinfecting fruit by washing in water with 1-1/2 teaspoon bleach per gallon of water. Dry thoroughly with a soft cloth and pack fruit 1 or 2 layers deep in shallow boxes. Remove fruits as they ripen.

Pumpkins and winter squash: Harvest mature fruit with hard rinds (ones that resist fingernail pressure) just before frost. Leave the stem on when cutting from the plants to prevent decay. Cure for 10 days at 80 to 85°F. The one exception is acorn squash: store at 45°F after harvest. (Curing acorn squash will lead to stringiness.)

Apples: Late maturing apples are best suited for storage. Store in baskets or boxes lined with plastic or foil to help retain moisture. Always sort apples carefully and avoid bruising them. Store apples as close to 32°F as possible, a temperature of 30 to 32°F is ideal. Because apples give off a gas, ethylene, that will hasten the ripening of other fruit, store apples separately from other crops if possible.

Pears: For good flavor and texture, ripen pears after harvest. Pick pears when they are fully mature, firm in texture and light green in color. Ripen pears by placing them in a room at 60 to 65°F for 1 to 3 weeks. Once pears ripe, the fruit is soft and a yellow-green color, transfer to the refrigerator and store at 29 to 32°F and 90% humidity.

Many fall-harvested crops lend themselves to long term storage. Delahaut and Roper recommend the following storage conditions for extended shelf life and maximum eating quality of fall produce:

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Storage Temperature, Humidity & Storage Life of Selected Fruits and Vegetables

Commodity	Temperature (°F)	Relative Humidity (%)	Storage Life
Apples, late season	30-38	95	2-6 months
Beet, bunched	32	98-100	10-14 days
Beet, topped	32	98-100	4-6 months
Broccoli	32	95-100	10-14 days
Brussels Sprouts	32	95-100	3-5 weeks
Cabbage	32	98-100	3-6 weeks
Carrots, bunched	32	95-100	2 weeks

Commodity	Temperature (°F)	Relative Humidity (%)	Storage Life
Carrots, mature	32	98-100	3-6 weeks
Cauliflower	32	95-98	3-4 weeks
Celeriac	32	97-99	6-8 months
Celery	32	98-100	2-3 months
Garlic	32	65-70	6-7 months
Horseradish	30-32	98-100	10-12 months
Kale	32	95-100	2-3 weeks
Kohlrabi	32	98-100	2-3 months
Onion, dry	32	65-70	1-8 months
Parsnip	32	98-100	4-6 months
Pears	34-36	95	2-4 months
Pepper, sweet	45-55	90-95	2-3 weeks
Potato, late	50-60	90-95	5-10 months
Radish, winter	32	95-100	2-4 months
Rutabaga	32	98-100	4-6 months
Squash, winter	50	50-70	Variable
Tomato, ripe	46-50	90-95	4-7 days
Turnip	32	95	4-5 months

¹ From Knott's Handbook for Vegetable Growers

In addition, Delahaut recommends the following conditions for curing fall vegetables:

Ideal Temperatures and Humidity Levels for Curing Vegetables

Commodity	Curing Temp. (°F)	Curing Relative Humidity (%)	Length of Curing Time	Storage Temperature after Curing (°F)
Potato, late season	60-70	80-90	10-14 days	40-45
Onion	60-80	40-50	3-7 days	32
Pumpkin	80-85	80-90	10 days	55-60
Sweet Potato	80-95	95	10 days	55
Winter Squash (except Acorn)	80-85	80-90	7-14 days	55-60

For more information on making the most of home and market produce, see **Storing Fruits and Vegetables from the Home Garden, 2006** (A3823) available from your county extension office or online from the UWEX Learning Store <http://learningstore.uwex.edu/pdf/A3823.pdf>.

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