HOME GROUNDS FACT SHEET

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Storing Vegetables and Fruit

What in the world are you going to do with all those vegetables?

If your garden has been even moderately successful, you're sure to be harvesting more vegetables than you can consume at once. If you've canned all you can and your freezer is full, it's time to start thinking about storing for future use. When frost threatens - and it will be here before you know it - you will suddenly have an overabundance of vegetables to deal with.

Different vegetables require different storage conditions and keep for varying lengths of time. Certain general rules, however, apply to all:

- Vegetables should be mature or nearly mature at harvest.
- They should be free of all visible evidence of disease or severe insect damage.
- They should be handled carefully to avoid the cuts and bruises that increase the likelihood of mold or bacterial decay in storage.
- They should be harvested prior to any severe or chilling frost. Even a light frost may cause invisible damage that will keep them from storing well.

Where are you going to find these storage conditions? Consider one or more of the following possibilities:

Storage locations

Refrigerator

An extra refrigerator is ideal for storing small quantities of vegetables requiring cold or cool/moist conditions. If it's a manual defrost model, so much the better - it will be easier to regulate the temperature. Armed with a thermometer and the knowledge that the temperature in the crisper is 3° colder than the upper level, you should be able to provide optimum conditions.

The relative humidity is about 40% - 50% in the refrigerator, a little more in the crisper. Humidity can be increased by washing the vegetables, putting them in plastic bags with two to four 1/4" holes for ventilation, and closing with plastic ties. The cold surface of the plastic bags causes the water vapor inside the bag to condense.

Preservation Methods for Specific Vegetables

Produce	Store	Can	Pickle/ Preserve	Freeze
Asparagus				X
Beans, Wax or Green		X		X*
Beans, Dry (kidney, navy, white marrows, turtles)	X			
Beets	X*	X	X	
Broccoli		X		X*
Brussels Sprouts	X			X
Cabbage	X*		X	
Cauliflower	X			X
Celery	X			
Chard				X
Chinese Cabbage	X			
Corn		X	X	X
Greens - Kale	X			
Swiss Chard		X		X
Spinach				X
Horseradish	X		X	
Kohlrabi	X			
Parsley	X**			X
Parsnips	X	X		
Peas		X		X
Peppers, Hot	X**			
,Sweet		X		X
Potatoes	X*			
Potatoes, Sweet	X	X		
Pumpkins	X*	X		
Rutabagas	X			X
Salsify	X			
Tomatoes	X	X*		
Winter Radishes	X			
Winter Squash	X*	X		X

*Preferred Method **Dried

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Insulated cooler

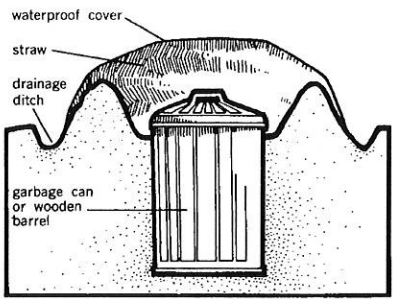
A plastic foam cooler or a box constructed of expanded polystyrene sheets will also serve if kept outside in a sheltered area such as an enclosed porch.

If the box is kept full, the vegetables will keep each other from freezing. They are living things, even after being separated from the plants, and will continue to give off heat from their respiration as long as they are alive. Again, as above, use ventilated plastic bags for humidity.

Basement

For long-term storage of vegetables in a basement that has a furnace, you must partition off a room and insulate it.

Pick the north or east side, if possible, in an area that includes a window, no heating ducts or pipes. Putting in removable slatted flooring will keep the vegetables off the floor, help circulate the air, and allow you to use water or wet material (such as dampened sawdust) underneath to increase the humidity. The room can be kept cool by opening the window on cool nights and closing it on warm days. Be sure to have a screen to keep out animals and insects and a shade to keep out light.



In-ground container

You can bury a galvanized garbage can upright, leaving four inches above ground level. This will keep potatoes, beets, carrots and turnips through the winter. Keep them in perforated plastic bags of a convenient size for use. Choose a well-drained site and dig a ditch around to divert surface water. Cover the can lid with straw and waterproof canvas or plastic.

Birthplace

Leave them in the ground. Beets, carrots, kohlrabi, turnips, radishes, rutabagas, parsnips and horseradish can be left in the ground where they grew.

When there's a good frost - a crusting of the ground - in late November or early December, cover them with a two-foot layer of oak, leaves (not maple), straw or coarse hay. Only use non-packing materials. Cover with burlap. Be sure to mark the area with stakes, or you'll never find what you want when everything is covered with snow.

If you've mulched properly, vegetables should not freeze. If they should be frozen, take out only what you'll cook the same day; they won't keep in the refrigerator.

Curing

Some vegetables must be cured before storing at their optimum temperature.

Potatoes

After harvest, hold them in moist air for a week or two at 60° to 75°F. Wounds do not heal at 50° or below. They will then keep for several months in cool moist conditions. Be sure to store them in the dark to keep them from turning green. Stored potatoes tend to become sweet, but if you hold them at about 70°F for a week or so before using them, they'll return to normal.

Sweet potatoes

They require moist air at 80° to 85°F for about ten days. These conditions can be achieved under your furnace if crates are covered with a heavy cloth. Extend the curing period to two or three weeks if the temperature is under 75°. Then move them to a relatively warm dry location.

Pumpkins and squashes

Harvest before frost and leave a piece of stem on them when you cut. Cure for ten days at 80° to 85°F (near the furnace is probably your best bet). Curing hardens the rinds and heals surface cuts, but don't expect bruised areas or insect injuries to be healed. After curing, store them in a relatively warm, dry place. (See chart.)

Don't store fruits with vegetables. Many fruits, including apples and pears, give off ethylene gas. This gas affects many vegetables: it causes carrots to taste bitter, it bleaches the color from cabbage; and it will cause tomatoes to ripen. Such togetherness is not good for fruits either - most readily absorb the odors and flavors of "strong" vegetables.

Tomatoes

Some special instructions are in order for tomatoes. You want to keep them on the vine as long as possible to get that vine-ripened taste, but don't play Russian roulette with the weather or you may lose everything.

Matured green tomatoes will be ripe enough to eat in about two weeks if kept at 65° to 70°F. The ripening period can be slowed down to three or four weeks if the temperature is 55°F. (Don't let it get below 50°F.) The immature ones will take longer at either temperature.

Forget everything you've heard about wrapping each tomato in paper. That's done to slow down moisture loss, but can be achieved in a more convenient way. Spread the tomatoes out on a layer of newspapers (or in a box lined with newspapers) and cover them with another layer of newspapers that can be easily lifted to check the ripening process. They should be checked regularly so you can remove any rotting ones.

Green tomatoes do not require light to ripen and in fact, should not have direct sunlight. Once ripened, they can be refrigerated or stored.

Home storage of fruits

Many fruits can be preserved only by freezing or canning. Of the fruits that do store well, only those that mature in the late fall or that can be purchased in the winter can be considered for home storage. Apples and pears can be stored long-term and grapes for a shorter time. If you plan to store a large quantity of fruit each year, special facilities should be provided. Fruits generally prefer cooler temperatures than most vegetables and constant air circulation is necessary to remove gaseous substances produced by the fruits that can speed up the ripening process.

Apples

Late maturing varieties of apples will store for use throughout the winter if the fruit is hard, mature and in perfect condition. Apples picked too green are subject to a number of storage disorders such as scald and bitter pit; if picked beyond maturity, they quickly become overripe in storage.

Cool as quickly as possible after harvest for best results. For most varieties of apples, the optimum storage temperature is 30°-32°F with a 90% relative humidity. Higher storage temperatures reduce the storage life considerably, as apples ripen twice as fast at 40°F as at 32°F.

Apples can be stored outdoors in insulated boxes, straw-lined pits or buried containers as long as the outside temperatures are above 10°F. They will last longer and retain more flavor if kept in a fruit cellar in plastic bags or in cardboard boxes lined with plastic sheets. The cardboard box and plastic bags or liners must be perforated to allow air circulation.

If the fruits are individually wrapped in tissue paper or newspaper before being placed in boxes or baskets, you will achieve better results. Plastic liners help maintain high humidity and prevent the apples from being affected by the surrounding air. The balance of humidity is subtle; excessive humidity will encourage decay and insufficient humidity will encourage shrivelling.

Avoid storing apples too long and regularly check for signs of spoilage. Mustiness will spread to healthy specimens. When spoilage or withering becomes a problem, the apples can be preserved by canning techniques. Storage duration depends on the variety.

Storage Duration for Different Apple Varieties

Variety	Normal Storage Period[1]
Winesap	5-7 months
Yellow Newton	5-6 months[2]
Rome Beauty	4-5 months
York Imperial	4-5 months
Northern Spy	4-5 months
Cortland	3-4 months
Delicious	3-4 months
Rhode Island Greening	3-4 months
McIntosh	2-4 months[2]
Jonathan	2-3 months[2]

[1]If stored under ideal conditions
[2]Require higher storage temperatures (35-40°F), therefore controlled atmosphere (CA) storage is required for maximum storage duration.

Recommended Storage Conditions for Fruits

Produce	Recommended Temperature	Relative Humidity	Freezing Point,°F	Approximate Storage Life
Apples	30-40°F	90%	29.3	2-7 months*
Grapefruit,				
Fla. & Texas	50°F	85-90%	30.0	4-6 weeks
Cal. & Ariz.	58-60°F	85-90%	30.0	4-6 weeks
Grapes,				
Vinifera	30-31°F	90-95%	28.1	3-6 months
American	31-32°F	85%	29.7	2-8 weeks
Oranges,				
Fla. & Texas	32°F	85-90%	30.6	8-12 weeks
Cal. & Ariz.	38-48°F	85-90%	29.7	3-8 weeks
Pears	29-31°F	90-95%	29.2	2-7 months*

* Length of storage depends on variety

Grapes

Grapes can be stored as whole fruit in a cellar for 4-6 weeks. Storage can be useful to hold the fruit until processing as juice or wine can be accomplished or to extend the time they can be eaten as table grapes. Grapes readily absorb odors from other fruits; keep them away from other produce if possible. They can be stored in cardboard boxes or crates lined with a layer of clean, dry straw. Pack bunches no more than two or three layers deep and place straw or sawdust between each bunch. Check often for spoilage.

Pears

Several varieties of pears can be stored for fall and winter use in a basement fruit cellar. They should be picked at optimum maturity when they are hard and the color has changed from dark to pale green. Select only perfect specimens for storage.

Pears are very sensitive to temperature and should be stored at 29°-31°F. The storage life of some pears can be one third longer at 30°F than at 32°F. Precise temperature control is required to prevent freezing.

Pears lose moisture rapidly. For storage, wrap individually in tissue or newspaper and store in cardboard boxes lined with perforated plastic.

Pears ordinarily do not ripen at storage temperatures as apples do. If pears are stored too long or at too high temperatures, or the temperature of ripening is too high (above 85°F for most varieties, but as low as 70°-75°F. for Keiffers) they will break down without ripening, often becoming rotten inside while the outside looks sound.

Variety	Normal Storage Period[1]
Winter Nelis	6-7 months
Anjou	4-6 months
Bosc	3- 3.5 months
Keiffer	2.5-3 months
Comice	2.5-3 months
Bartlett	2.5-3 months

[1]Based on proper maturity and optimum storage conditions.

For more information or to receive other horticultural bulletins, contact your local Cooperative Extension.

Resource: Doris Erickson, Vegetable Storage; Cornell University, Fruit Storage NRAES 7

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