

Vegetable Storage

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THREE sources of vegetables are available for fall and winter use; first, semi-hardy and hardy crops that can be gathered from the garden; second, vegetables that have been canned or dried; and third, vegetables in storage.

This publication deals with practices of storing vegetables so that they may be kept as long as desirable with the least loss from shrinkage and decay.

Vegetables for storage. Crops that can be kept successfully include the various vegetables mentioned in this bulletin. Vegetables for storage must be sound, in a proper stage of development, and free from blemishes such as cracks, cuts, bruises, or injuries due to insects, all of which are usually conducive to rots and molds.

Storage places. Vegetables can be stored in the cellar under the house, in pits or banks, in special houses built for storage or in outdoor cellars. Cellars containing a furnace are usually too warm and dry for vegetable storage. A room can be partitioned off in the cellar or basement, building the partitions of non-heat-conducting material such as stone or hollow tile. There should be at least one window in the room to assist in ventilating and regulating temperature. The construction of outdoor pits is discussed in the paragraphs regarding root crops. Special houses are built for such crops as onions, when grown on a commercial scale.

Boxes or crates can be used for storing vegetables such as peppers, tomatoes, and eggplant. For certain vegetables bins can be built. Shelves suspended from the ceiling or rafter beams are useful for holding pumpkins, squash, and other vegetables that would spoil if allowed to lie on the cool damp ground or piled in bins. A slat floor a few inches off the ground may be made to hold boxes and other containers so as to permit free circulation of air and prevent the containers from becoming nesting places for mice.

Conditions for storage. Temperature, moisture, and ventilation are important factors in storing vegetables. Moderately high temperatures cause shrinkage and breakdown, whereas temperatures below 32° F. may cause freezing injury and subsequent breakdown. With the exception of squash, pumpkins, dry beans, tomatoes, and peppers, temperatures ranging from a few degrees above 32° to 40° or 45° F. are most suitable. The optimum humidity or air moisture varies with the vegetables being stored. Root crops shrink badly in an atmosphere of low humidity, but potatoes, onions, squash and dry beans store best under relatively dry conditions.

Beans and peas. Harvest individual pods or pull up entire plant with pods on and spread in a dry place. Thresh as soon after harvesting as pods are dry. After threshing fumigate with carbon bisulfide to kill weevils. The dosage is from 5 to 8 pounds to 100 bushels of seed, or 1 pound to 100 cubic feet of space. For small lots, use a half-gallon jar of threshed seed, pour one tablespoonful of carbon bisulfide over the top and tightly close the jar, leaving it for 48 hours. Dry beans for table use should be well aerated after fumigation before being used for food (see Circular of Information 273, *Bean and Pea Weevils*).

Beets, carrots, parsnips, salsify, turnips. In Western Oregon roots are best stored by leaving them in the ground with the tops cut off an inch or two above the apex of the roots, putting sufficient earth over the rows to keep them from being injured by cold weather. If the roots are dug to be stored in the cellar, they must be placed in moist earth or sand—otherwise there is considerable shrinkage. Outdoor pits are often used for root crops. To construct such a pit choose a well-drained location, digging a trench 6 or 8 inches deep and of suitable size to hold the amount of roots to be stored. Line with straw and fill with the roots, heaping them into a cone-shaped pile. Cover with the same material used to line the pit, then add earth to a depth of two or three inches or more, according to the severity of the weather. Ventilation may be secured in small pits by extending the straw covering of the vegetables through the earth covering, or a hollow-tile pipe or flue of rough boards may extend up through the pile of vegetables. Cap any ventilation holes with a board or stone. Parsnips are the hardest of the roots and may be dug as needed. In contrast to the carrot, the sugar content of parsnips increases after cold weather and during storage.

Cabbage. Well-matured solid cabbage will keep well in a cool cellar on a shelf laid preferably not more than two layers deep. Cabbage keeps best at about 32° to 40° F., but is not injured by slight freezing. In the field the heads can be protected from mild frosts by putting a few of the large thick outer leaves over the apex of the heads before night. Solid heads of cabbage may be stored in a pit such as described for beets. The plants are pulled, roots and all, and placed in a pit with the heads down, being covered sufficiently to protect them from freezing.

Celery. Protection of this vegetable from cold weather can be obtained by having the plants banked with boards, soil or both. Celery will freeze at a temperature of about 28° or 29° F. If one has a frost-proof cellar or outhouse, plants not yet fully grown nor blanched may be dug up with the roots on and placed in moist sand or soil. Water at intervals to keep the plants rooted and also provide proper aeration. Some home gardeners store their celery in a protected coldframe. Plants in the boards subject to freezing temperatures may be protected further by using gunny-sacking at night, removing the material in the daytime. Commercial celery keeps well in crates in cold storage with temperature approximately 31½° or 32° F.

Eggplant can be kept for several weeks after freezing temperatures by cutting the fruits from the plants and placing in boxes with a lining of dry sawdust. Particular care must be taken to keep the eggplant from being bruised before storage. Old sacks covering the plants and fruit in the field during light frosty weather will lengthen harvest for several weeks.

Onions. Previous to putting onions in storage, the bulbs are pulled in the field and laid in windrows for cutting, three rows of onions usually comprising a windrow. The onions lie in the rows for two and a half to three weeks, depending on the weather, at the end of which time they should be dry and well enough cured to be brought into the storage house. Onions are stored on racks usually piled from 8 to 12 inches deep, having their tops on when in storage. The average freezing point of onions is about 30° F., so that a temperature of 36° to 45° F. is best. It is necessary to have circulation of air so that there may be a comparatively low percentage of humidity. Onions should not be handled in storage while frozen. Poorly shaped onions of a poor keeping strain will usually have a short period of dormancy and will sprout readily. Well-shaped onions of long keeping strains may have a dormancy period of several months.

Peppers. Green or red peppers may be stored for several weeks without much shrinkage, provided the temperature is not above 50° or 55° F. and the relative humidity is about 85 to 90 percent. The thick-meated peppers, unblemished by bruises, are best for storage. Cover plants and fruits in field as suggested for eggplant.

Potatoes. The best storage temperature for table or seed potatoes is one high enough, for the first two weeks at least, to permit of suberization of wound injuries, preferably 50° to 60° F. After this, the tubers are best kept at about 40° or 45° F. Light should be excluded, and while a fairly high degree of humidity is desirable there should be an ample supply of aeration. Types of potato storage include outside pitting, dugouts, or cellars as well as insulated structures. (See references on page 4 for complete publication on potato storage.)

Pumpkins and squash. There is often considerable decay of these two vegetables in storage. Decay may be largely prevented if the specimens are fully matured in the field, are carefully handled when being harvested and brought in to the storage place, and are not subjected to low temperatures and high humidity when stored. Skin bruises must be avoided if the squash are to keep for any length of time. After the squash have been cut from the vines in the field, they may be left in groups but not piles for two weeks or so if the weather is favorable, being protected by the squash vines should frosts occur. The fruits should be stored one deep on racks or shelves in a dry, well-ventilated storehouse where the humidity is relatively low and the temperature is between 50° and 60° F. A slightly higher temperature may be maintained during the early part of the storage. Warm attic temperatures will probably prevent decay but there will be considerable shrinkage. On the other hand, a cool, moist storage place induces mold, especially if there has not been much care used in preventing exterior abrasions or bruises.

Tomatoes. Fruits that are in the turning stage or beginning to show color when picked will ripen normally when stored at 50° F. At 40° F. there will be no normal ripening in tomatoes of any stage of immaturity. The lowest temperature at which full ripening with good color and flavor will develop is 55° F. At this point the rate of ripening is comparatively slow, but there is no decay nor breakdown. This temperature is recommended for either storage or delayed-ripening purposes. Firm, fully ripe tomatoes also hold up satisfactorily at 55° F. If tomatoes are chilled down to 36° to 40° F. they may be expected to break down rather readily when brought up to higher temperatures. All fruits for storage should be carefully handled without bruises and the fruit itself should be sound.

OTHER PUBLICATIONS USEFUL IN HOME VEGETABLE GROWING

Oregon State Agricultural College

Extension Circular 443, The Farm Vegetable Garden.

Extension Circular 444, Growing Fall and Early Winter Vegetables.

Extension Mimeograph Circular 268, A Monthly Schedule of Operations in Vegetables for Home Use on the General Farm.

Oregon Experiment Station Circular of Information 48, Vegetable Crop Insect Pest Control Program.

U. S. Department of Agriculture, Washington, D. C.

Circular 415, Some Effects of Freezing on Onions.

Farmers' Bulletin 847, Potato Storage and Storage Houses.

Technical Bulletin 268, Effect of Various Temperatures on the Storage and Ripening of Tomatoes.