

# HOME VEGETABLE STORAGE

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# Home Vegetable Storage

**V**EGETABLES are essential to health, for they are rich in vitamins, mineral salts, and roughage necessary for normal, healthy development of the body. Liberal quantities should be used not only during the growing season but also should be preserved for winter use. By canning, drying, freezing, and fresh storage methods the grower can keep most vegetables on hand to stimulate his appetite and keep his body healthy and vigorous during the long winter months. Where possible, it is desirable to use the storage method.

Vegetable storage pays in money saved, in satisfaction, and in convenience. Proper storage saves many vegetables that would otherwise be wasted when cold weather overtakes the garden in the fall. It is quicker, cheaper, and easier than canning, drying, or freezing, and it is the only satisfactory method of preserving certain vegetables. Furthermore, the quality and nutritive value of some vegetables are greater, if properly stored, than if canned or dried.

## VEGETABLES STORED

Among the vegetables often stored for fall or winter use are beans, beets, cabbage, carrots, celeriac, celery, popcorn, horseradish, kohlrabi, onions, parsnips, peas, potatoes, pumpkins, rutabagas, salsify, squash, tomatoes, turnips, and various herbs. Parsnips may be left in the field all winter and dug as needed for use. Chicory and rhubarb may be forced in the basement during the winter; parsley and chives can be potted and grown as house plants.

## Planting Time

Not only should the vegetables be stored under proper conditions but also they should reach proper stage of development at storage time. For home

storage, they should mature as late in the season as possible and yet should avoid injury by cold weather. With some vegetables it is necessary to plant at different dates for storage and for immediate table consumption. An early maturing variety should be planted later than a late maturing one. The shorter the growing season, the earlier the planting should be made. The more favorable the growing conditions, such as moisture, temperature, and soil fertility, the later one can plant.

By knowing when the crops are apt to be injured by fall frosts in his locality and the number of days required for the crops to reach maturity, the grower can determine when to plant in order to bring the crops into bearing at the proper time for storage.

**Beans (dry snap and dry bush lima), late cabbage, and rutabagas require 90 to 110 days to reach maturity; beets and kohlrabi, 60 to 80; carrots, 75 to 100; celeriac, onions (from seed), parsnips, pumpkins, and salsify, 100 to 120; celery, 115 to 130; peas (dry), 80 to 100; potatoes, 100 to 140; squash, 70 to 120; tomatoes, 100 to 130; turnips, 45 to 60.**

The number of days from planting to maturity varies considerably in each crop because of different varieties and

growing conditions. However, the approximate time required by a variety can often be obtained from seed catalog descriptions.

### Essential Storage Conditions

The object of vegetable storage is to preserve the product stored for as long as possible in a condition which approaches the fresh state as nearly as possible.

Vegetables when stored are not dead but are living organisms, and growth functions continue until the plant matures. Since the plant is no longer able to draw nutrients from the soil, it has to use materials stored in itself for these functions, and finally shriveling and breakdown occur. The living plant cells take in oxygen and give off carbon dioxide and water. If oxygen is not available or if carbon dioxide ac-

cumulates in the tissues, the plant is injured. Proper control of the temperature, humidity, and air circulation, helps to retard these internal activities and prevents moisture loss, thus prolonging the plant's life and usability.

However, all storage vegetables do not require the same temperature, moisture, and aeration conditions. In general they can be roughly classified into the groups shown in table 1.

Although they require slightly different storage conditions for best results, all vegetables in the cool-moist and cool, moderately moist groups can be stored fairly successfully in the same room. However, other storage should be provided for the other crops. An attic or furnace room often provides a good storage place for squash and pumpkins. Beans, peas, and onions also might be stored there. Herbs can be stored at ordinary room temperatures.

Table 1. Storage Table for Vegetable Crops

Crop	Temperature °F.	Humidity Per Cent	Air Circulation	Maximum Storage Period
				Months
<b>Cool, Moist, Little Air Circulation:</b>				
Beets .....	32-40	90-95	Little	4-5
Carrots .....	32-40	90-95	Little	4-5
Celeriac (Roots) .....	32-40	90-95	Little	3-4
Celery .....	31-32	90-95	Little	3-5
Horseradish .....	32-40	90-95	Little	4-6
Kohlrabi .....	32-40	90-95	Little	2-3
Parsnips .....	32	90-95	Little	4-5
Rutabagas .....	32-40	90-95	Little	3-4
Salsify .....	32	90-95	Little	3-4
Turnips .....	32	90-95	Little	3-4
<b>Cool, Moderately Moist, Little Air Circulation:</b>				
Cabbage .....	32-40	90-95	Little	4-5
Apples .....	30-40	85-90	Little	1-7
Potato (Table Stock) .....	36-40	85-90	Little	5-6
Potato (Seed Stock) .....	32-36	85-90	Little	6-8
Popcorn .....	30-32	85-90	Moderate	Indefinitely
<b>Cool, Dry, Ample Air Circulation:</b>				
Onion .....	31-32	70-75	Ample	5
Garlic .....	32	70-75	Ample	5-6
Dry beans .....	30-32	70-75	Ample	Indefinitely
Dry peas .....	30-32	70-75	Ample	Indefinitely
<b>Warm, Moist, Little Air Circulation:</b>				
Tomatoes (Green) .....	50-60	95-98	Little	1
Tomatoes (Ripe) .....	40	95-98	Little	1/3
<b>Warm, Dry, Ample Air Circulation:</b>				
Squash .....	40-50	50-70	Ample	4-7
Pumpkin .....	40-50	50-70	Ample	3-4

### Temperature

Temperature control is very important. Temperature affects the life processes of the stored product markedly. As the temperature increases, life processes increase also, but at a much more rapid rate. As the temperature decreases these processes slow down, which is desirable for good storage. Therefore, it is best, in most cases, to keep the products at the lower temperature cited in the table, but they should not be allowed to freeze.

Avoid rapid changes in temperature. An even temperature gives the best results. The temperature should be lowered as rapidly as possible in the fall by opening the ventilators at night and closing them in the daytime. After the desired temperature has been reached and cold weather sets in, it is fairly easy to maintain it by proper control of ventilation if the cellar is properly constructed. Watch the temperature near the inlets and doors and wherever high or low temperatures may occur. Several accurate thermometers are better for this than one.

### Ventilation

Good ventilation is necessary to maintain the proper temperature and humidity, to remove odors, and to aid in sanitation. It is particularly important to insure ample air circulation during the early storage (three to six weeks), since the life processes are very active at this time when many vegetables go through a "sweating" period during which there is an excess of heat and moisture given off. Unless these are carried away, rotting may occur. In the ventilation system, inlet flues should open into the cellar near the floor and the outlet flues should open out near the ceiling. Sixty to 80 square inches of flue area should be provided to ventilate each thousand cubic feet of storage space up to a room capacity of 5,000 cubic feet. For larger cellars, the flue area can be reduced to 45 to 60 square

inches per 1,000 cubic feet of storage space. Flues should be provided with adequate shutoffs.

While the temperature, humidity, and aeration possibly are most important in storage of vegetables, there are other important considerations.

### Humidity

Cellars should be maintained at a constant, proper relative humidity. High humidity tends to prevent water loss from the stored vegetables and consequent shrinkage, and vegetables, except those listed as preferring a dry storage, store best at a rather high humidity. However, humidity should not be so high as to cause condensation on the ceiling, walls, or floor of the cellar or on the stored product. Excessive moisture in the air can usually be removed by proper aeration and drainage. If the cellar is too dry, sprinkle the floor occasionally with water—more often with concrete floors than with dirt floors—to keep humidity up.

### Condition of Products

Products to be stored should be of good quality, free from disease and insect or mechanical injury, medium sized, clean and dry, and properly matured. Only the best of the crop should go into storage. Diseased material not only may spoil itself but also may cause other products with which it comes in contact to spoil. Skin injuries caused by insects or rough handling in harvesting or storing often provide entrances for diseases which, in many cases, could not penetrate an uninjured skin. Clean material dries off quicker, stores better, and does not have a dirt covering which might harbor injurious insects or diseases. Cabbage, onions, squash, pumpkins, and dry seeds should be thoroughly mature when stored. Root crops should not become fully mature or oversize since they often become woody and lose flavor with age.

### Sanitation

The storage room should always be clean and sanitary. After the vegetables are removed in the spring, all refuse should be removed and the walls, shelves, and floors thoroughly cleaned. It is also desirable, in many cases, to spray with some fungicide such as copper sulphate (blue vitriol) to remove disease organisms which might damage the vegetables after storing.

### STORAGE STRUCTURES

From the preceding discussion it can be seen that successful storage requires several kinds of storage places, ranging from cool-moist to moderately warm-dry. Since the greatest need in most homes is for a comparatively large area in which a cool-moist condition can be maintained, only descriptions of storage structures providing cool-moist conditions will be presented. A choice is possible ranging from inexpensive temporary outside pits to a specially con-

structed permanent storage cellar. The structure chosen will depend on many factors such as available materials and the amount of labor and expense the family is willing to incur.

### Pit Storage

Beets, carrots, rutabagas, cabbages, parsnips, salsify, potatoes, and turnips often can be stored in outside pits. This method should be used only when other methods are not available.

The pit should be on a slight elevation where the soil is well drained and light, but not too sandy. Dig a trench 3 feet deep, 3 feet wide, and as long as desired. Have a ventilator shaft, 6 to 8 inches in diameter, with holes bored in it where it passes through the stored material, running from the bottom of the pit to 24 inches above the pit cover. Cover the top to keep out snow or rain, and stuff the shaft with straw in cold weather. Have one ventilator for each 8 feet of pit length.

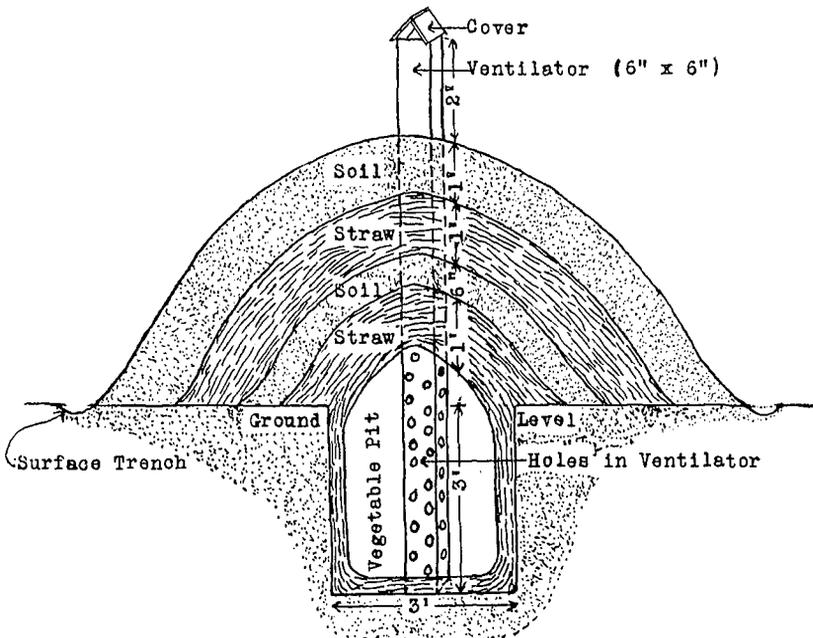


FIG. 1. PITS PROVIDE STORAGE FOR MANY VEGETABLES

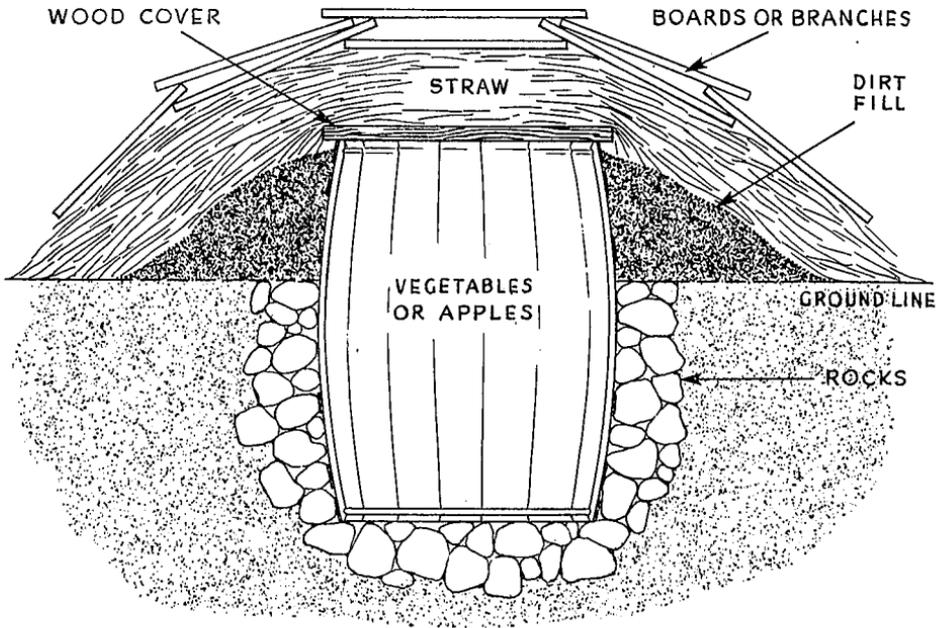


FIG. 2. DIAGRAM OF A BARREL PIT

Place the vegetables in the pit. In early fall cover with a layer of straw 1 foot thick and cover the straw in case of rain to keep the contents dry. When freezing weather sets in, cover the straw with a 6-inch layer of soil. As the weather becomes colder, cover with another layer of straw and soil each 1 foot thick. In extremely cold areas, a third layer of straw and soil of the same thickness should be added. A covering of 3 to 4 feet of dry peat will also give good results.

A trench around the outer edge of the pit cover with an outlet to provide drainage away from the pit helps remove surface water. Crossed trenches in the bottom of the pit, covered with wire screening, aid in removing excess moisture from the interior.

Pit size depends on the amount of produce removed at one time in cold regions. With several small pits, the entire contents of a single pit may be removed at one time, thus decreasing the amount of damage done in cold

weather by opening and closing the pit. If this method is used, place some of each of the vegetables stored in each pit.

### Cellar Under House

Some houses have a cellar independent of the foundation and unheated except for natural earth heat and the warmth from the floor above. Such cellars usually have an earth floor and in some cases earth walls. They often maintain good conditions of humidity but may require attention to prevent freezing during extended sub-zero periods.

The excavation should be considerably smaller than the house area, and it should have at least 3 feet of earth wall between it and the foundation on all sides. The foundation and lower wall of the house should be well insulated by a layer of paper and banking of earth, sawdust, or straw (Fig. 3).

A cold air and warm air ventilation flue should be installed. These should

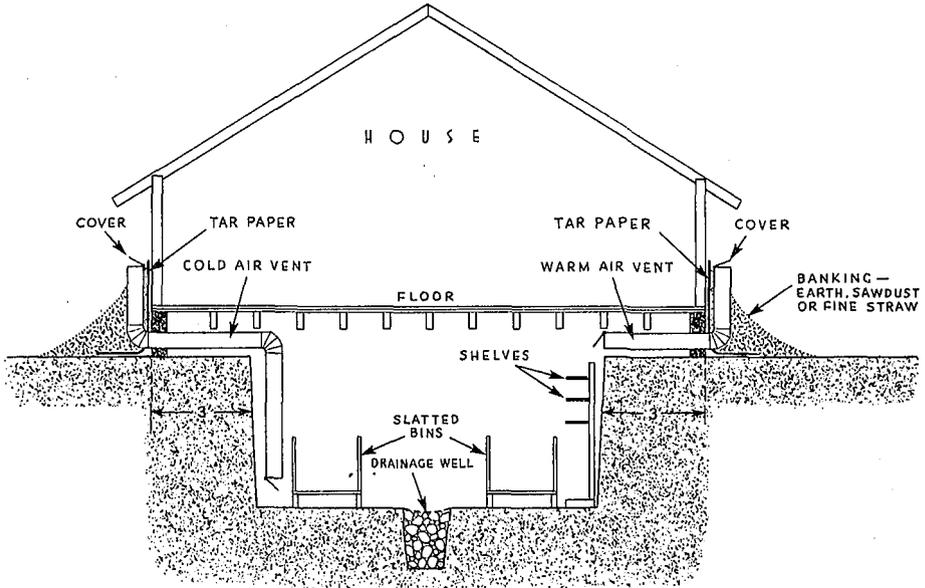


FIG. 3. A CELLAR OFTEN PROVIDES GOOD STORAGE PLACE

be well insulated and provided with tight covers or dampers to regulate air flow and to guard against freezing.

Cellars properly constructed and banked are usually free from frost except occasionally during long cold spells. A kerosene lamp or pail of live wood coals placed in the cellar usually gives sufficient protection during these periods.

### Outside Storage Cellar

Although not entirely necessary, a side hill is convenient for an outside cellar wholly or partly underground. The cellar should be well drained, near the house, and provided with a grade entrance or steps. The excavation should be about the same size as the cellar is to be, and the excavated material should be used for covering the roof and banking the sides.

A simple cellar may be built by setting a row of posts in the bottom of the excavation near each of the dirt walls and another down the center. A siding of one-inch boards, at least, is

advisable to prevent caving although this may not be needed in certain heavy soils. The roof may be made of poles, slabs, or even planks.

The whole structure except the door is covered with straw or marsh hay and then with soil. The door should be well insulated. It is often advisable to

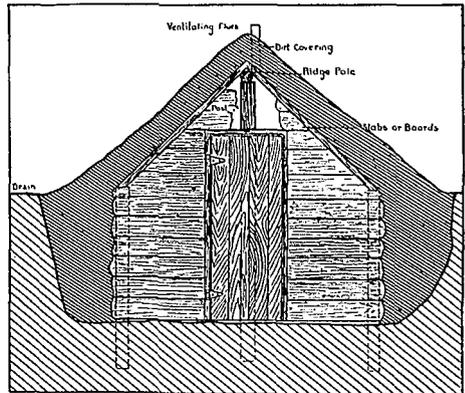


FIG. 4. END VIEW OF OUTDOOR STORAGE CELLAR

From U.S.D.A. Farmer's Bulletin 879.

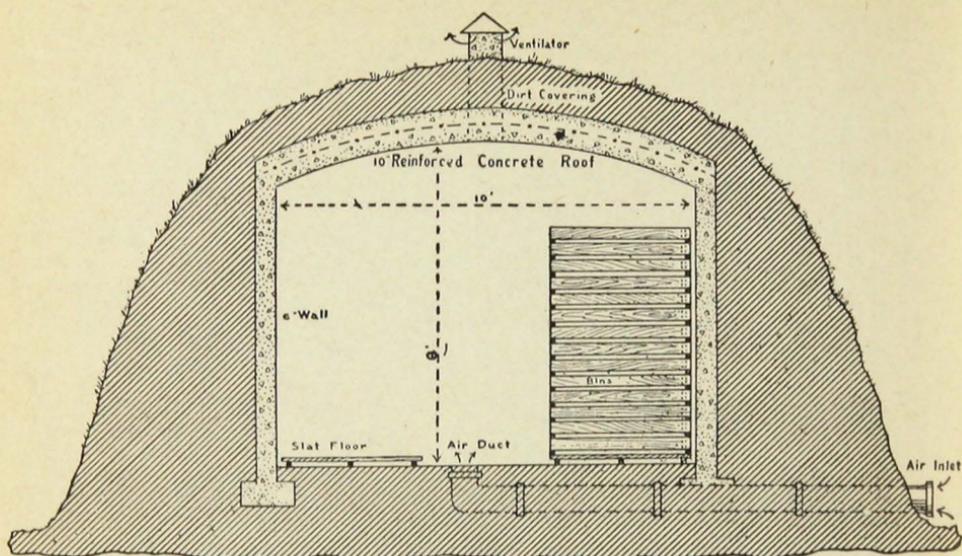


FIG. 5. CROSS SECTION OF CONCRETE STORAGE CELLAR  
From U.S.D.A. Farmer's Bulletin 879.

provide a short passageway at the entrance, with well-insulated doors at both ends, to keep out the cold. The colder the climate, the thicker the covering necessary. Dirt covering is often supplemented during the winter with straw, cornstalks, branches, or leaves.

The floor is usually dirt which aids in keeping up the air moisture. Good drainage is necessary. A tile drain of the proper size screened against rodents may serve as a cold-air intake as well. A ventilator shaft that can be closed in extremely cold weather should run

from the ceiling to about 2 feet above the dirt cover of the roof. Wood in such cellars rots quickly, and, for permanent structures, concrete, brick, stone, or hollow tile is used.

The following detailed plans of storage cellars may be obtained for a small charge from the Bulletin Office, University Farm, St. Paul.

243	12x20	Capacity 910 bushels, pole frame
342	12x24	Capacity 900 bushels, pole frame
201	12x25	Capacity 900 bushels, concrete
229	12x34	Capacity 1,150 bush- els, concrete

### Basement Storage

A cool, well-ventilated basement sometimes offers good storage conditions. Cellars with a furnace are usually too warm and dry for the storage of certain crops, especially root crops. It is often possible, however, to partition off one corner of a cellar for a storage room.



FIG. 6. A HOMEMADE OUTDOOR STORAGE CELLAR

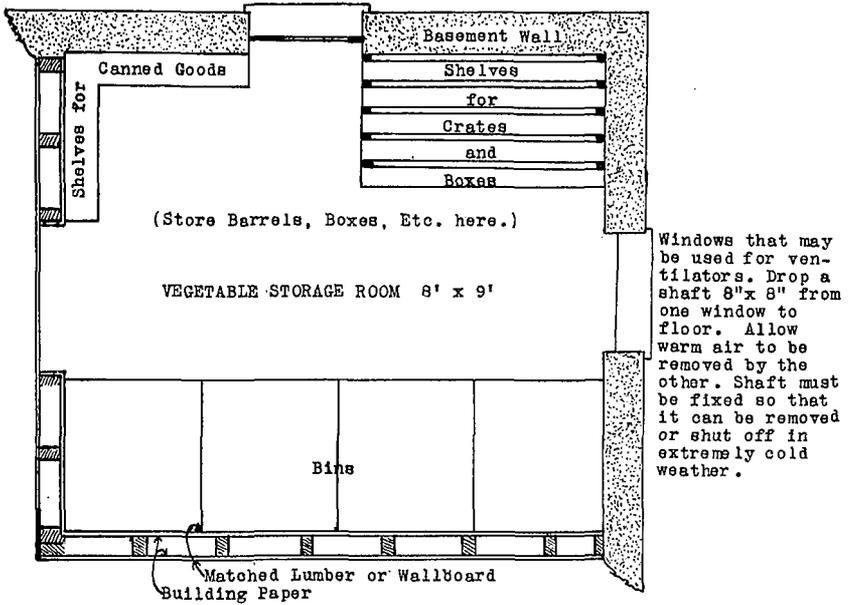


FIG. 7. BASEMENT STORAGE ROOM FLOOR PLAN

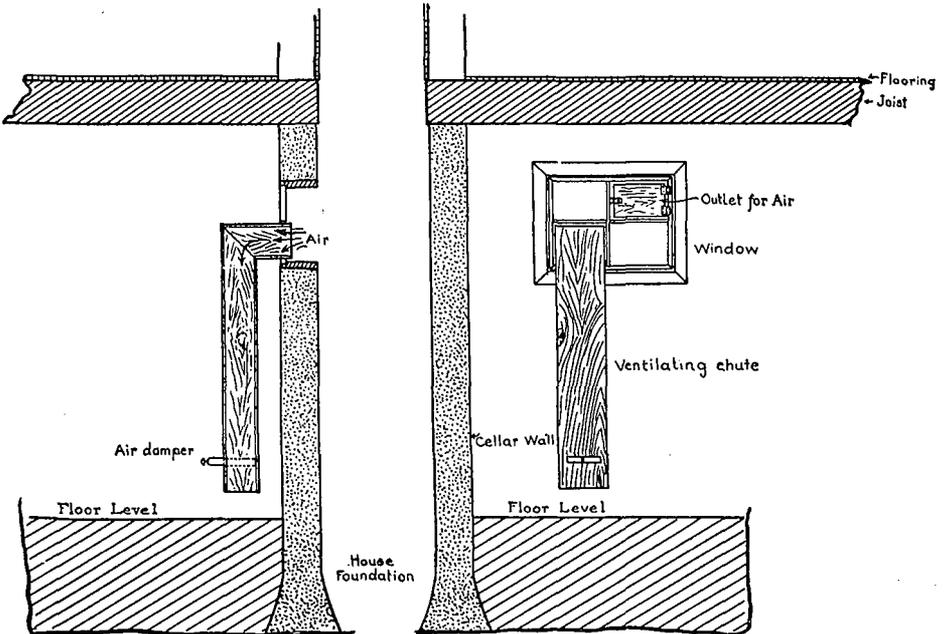


FIG. 8. CONSTRUCTION FOR VENTILATION OF A STORAGE ROOM IN A BASEMENT  
From U.S.D.A. Farmer's Bulletin 879.

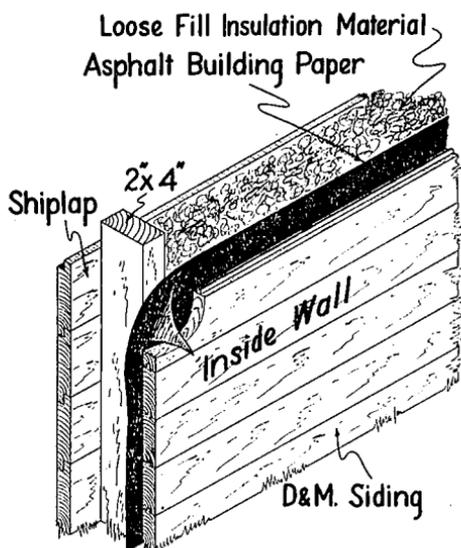


FIG. 9. INSULATION OF CELLAR WALL

The plan shown in figure 7 may be altered to suit conditions and needs.

In the plan in figure 7, the windows may be used for ventilators by dropping a shaft 8"x8" from one window to the floor to allow cold air to enter and warm air to escape through the other window. The shaft must be easy to shut or remove in extremely cold weather.

## Outside Storage Cellar Connected to Basement

It is often feasible to construct a small cave or special underground vegetable cellar outside the basement but connected with it. This is often placed under a porch. Properly constructed, it provides satisfactory storage.

In such a cellar, the doors should be double-boarded with building paper insulation between the boards. Ventilators should be provided with board covers easily removed or put on. Use screen covers in fall to keep out rodents. In extremely cold weather, ventilators may be stuffed with burlap or hay. Walls and ceiling should be made of concrete or some other permanent material. The floor may be of dirt or concrete. Ventilators should be 5 to 6 inches square, inside measurements.

## STORAGE SUGGESTIONS

### Beans and Peas

Pick beans and peas as soon as the pods are mature, spread in a warm dry place until thoroughly dry, and then shell. They are usually placed in bags which should be hung in a dry, well-ventilated place. Cans or jars often are

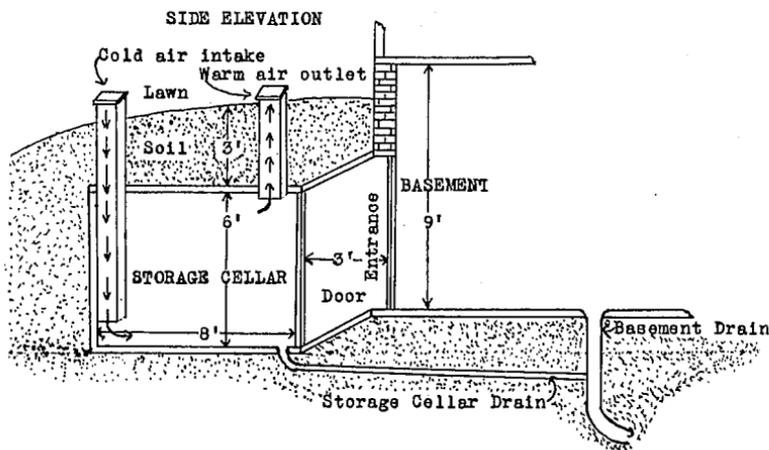


FIG. 10. PLAN OF AN OUTSIDE VEGETABLE CELLAR CONNECTED WITH THE BASEMENT

used for small quantities. To control weevils in storage, it is often desirable to heat the seed at from 120° to 145° F. for 5 to 6 hours or to fumigate them with carbon disulphide. In fumigating, place the seed in an airtight container; pour 1 ounce of carbon disulphide over 1 bushel of seed; close the container tight; keep temperature at 75° F. for 48 hours; then remove, aerate, and store. **Keep away from fires during treatment. Carbon disulphide is inflammable so the treatment should be carried on outside.** Storing the seed at 31° to 32° F. will also control weevils.

### Beets, Carrots, and Celeriac

Harvest beets when roots are 3 or 4 inches in diameter and when the soil is dry, and carrots when the roots are medium size. Cut tops of both about ½ to 1 inch above crown. For celeriac (turnip-rooted celery), lift roots as soon as frost appears and remove leaves and small side roots. Store roots in ventilated barrels or crates. If necessary to store in bins, do not pile roots in large piles because they may heat and decay. In basement storage these root crops often are stored in moist sand,

peat, or sawdust to keep up humidity. If the cellar has a dirt floor, they may be piled on the floor, covered with moist soil, and dug out as needed.

### Cabbage

Cabbage for storage should have compact, hard heads. Varieties of the Danish Ballhead type are suitable. The heads should be mature and disease free. Remove the roots just below the head as well as all loose, broken, and diseased leaves. Store cabbage in bins not larger than 4 to 5 feet wide, 5 feet deep, and as long as desired. Separate the bins by slatted walls with air spaces between to permit air circulation. Bins may be made in tiers if space is left between for circulation. A good method is to pile heads one to two layers deep on slatted shelves, especially if stored in the same cellar with root crops.

### Celery

Celery may be kept for a short period in the fall by placing enough earth around the plants to keep them upright. Just before severe weather oc-

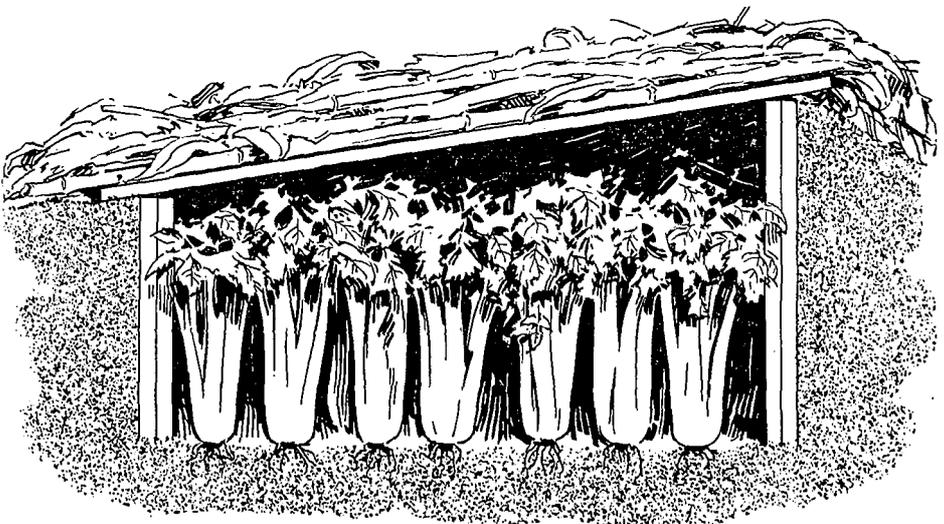


FIG. 11. CROSS SECTION OF HOTBED PIT USED FOR STORAGE OF CELERY ON A SMALL SCALE

cur's, bank the earth to the tops of the plants and, as it becomes colder, cover the ridge with straw or other like material held in place by cornstalks, branches, etc.

Celery may be stored also in trenches in the field. The trench should be about 12 inches wide, 24 inches deep, and as long as needed. Loosen the soil in the bottom, dig the plants with the roots and soil attached, pack the plants upright in the trench, cover the roots with soil, and then water. As soon as the tops have dried off and the weather becomes cold, cover the trench with a roof of boards, cornstalks, or poles. Place over this a light covering of straw. As the weather becomes colder, increase the covering. Hotbeds or cold frames might also be used (Fig. 11).

Either of the above methods should prove fairly satisfactory during the fall until real severe weather sets in. However, to avoid difficulty during unseasonable hot weather or precipitation it is desirable to remove the covering from the top long enough to permit aeration and some drying out of the storage. In very cold weather it often is difficult to remove the plants without injury.

To store celery in the cellar, place green plants, dug with the roots and some soil attached, upright in narrow boxes not quite as deep as the plants are tall. Place a few inches of damp soil or sand about the roots and pack the plants fairly tight in the box. Water the soil enough to prevent drying out but do not wet the foliage or stalks. Celery kept in this manner requires cool, moist storage with a moderate air circulation.

### Chives

The chive may be taken up in the fall, potted, and grown as a house plant during the winter. It belongs to the onion family but is milder in flavor, and the green leaves are very useful as a seasoning.

### Popcorn

Popcorn should be thoroughly mature when harvested. If stored at room temperatures, it should be put in airtight containers as soon as it is dried out sufficiently to pop well. If the corn becomes too dry to pop well, add a tablespoon of water to a quart of corn, shake well, and seal the container tightly.

When storing corn on the cob, it often is desirable to keep it in an unheated vestibule, summer kitchen, or attic. If kept in the heated part of the house, it often gets too dry to pop well and, if kept in the vegetable cellar, it becomes too moist.

### Garlic

Store under the same conditions as onions. Store the mature, compact, clean, white, unsprouted bulbs in loose layers on shelves or in open mesh bags which should not be piled more than two layers deep. If plaited in strings, the strings may be hung up. For short periods, garlic can be kept at higher temperatures if the storage place is fairly cool, dry, and well ventilated.

### Horseradish and Kohlrabi

Store horseradish and kohlrabi like carrots. Dig horseradish roots in the late fall, and harvest kohlrabi when the swollen stem is about 3 inches in diameter and before it becomes woody and loses flavor.

### Onions

Onions grown for storage should be thoroughly mature before harvest (when tops topple over just above the bulbs while the tops are still green). Onions having thick rigid necks do not store well and should be used soon after harvesting. The bulbs should be properly cured. Curing usually takes

three to four weeks. The two most common methods of curing onions are explained here.

**Field Curing.**—Place bulbs in wind-rows of four to six rows, with the tops partially covering the bulbs, and leave until the tops wither (usually from four to ten days). If rain occurs, turn the onions with a wooden rake to permit thorough drying. Then remove the tops with sheep shears about one inch from the bulbs. This method is satisfactory in dry regions. In case of rain, however, the bulbs may become discolored, may sunscald, or may rot or sprout.

**Curing in Shallow Trays.**—Pull the onions as before, twist off the tops, and drop the bulbs in trays, about 4x3 feet and 4 inches deep. The bottoms are made of lath with cracks between them for ventilation. Strips one inch thick are placed across the ends on the bottom to allow ventilation between the trays.

Fill the trays slightly below the top, leave spread out for a few hours to allow dirt on the bulbs to dry, and then stack in tiers and cover with a temporary roof of building paper if no curing shed is available. Onions cured this way remain bright, and there is very little loss from excessive heat or moisture. Bulbs should be marketed or placed in winter storage before freezing weather.

The onion storage should provide a low, fairly uniform temperature (32° to 36° F.), dry air, and good ventilation. If the onions are cured in shallow crates, they may be hauled directly to the storage and stacked in tiers with space between the tiers for air circulation. Otherwise, the bulbs should be placed in similar trays in the storage or 6 to 8 inches deep on shelves. Potato crates make good containers. Onions will not keep well in the general storage cellar since they need a drier atmosphere. The attic, furnace room, or an empty closet or room often fill their requirements.

## Parsley

Dig plants in the fall and transplant into large pots. In transplanting, take a considerable part of the root system with the soil surrounding it and remove several of the outer leaves. Then handle like any house plant.

## Parsnips and Salsify

Store like beets and carrots.

Parsnips are not injured by freezing and may be left in the field and dug as needed. They are not poisonous, even if left in the field over winter, but, after the flower stalk begins to develop in the second season of growth, they may become woody and poor in quality. Salsify, however, is not as hardy as parsnips, and, north of the Twin Cities, if left in the ground over winter, should be protected with a foot or so of marsh hay or straw.

## Potatoes

Storage potatoes should be clean, firm, sound, and free from disease. Harvest them after the vines are dead. When potatoes are first dug and put in piles, they go through a "sweating" period and give off moisture. At this time, a temperature of 65° to 70° F. should be maintained for 8 to 10 days and thorough ventilation should be provided. This hastens the formation of wound cork important in healing bruises and cuts and in preventing rots. Lower the temperature to proper winter storage temperature as rapidly as possible after the "sweating" period.

Do not store table stock potatoes below 36° F., or they may become sweet. If the potatoes have become sweet because of lower temperatures, exposing them to ordinary room temperature for a few days tends to restore the natural flavor. Seed potatoes may be stored as low as 32° F., but they should not be permitted to freeze. The lower the temperature, the longer before the potatoes sprout. The potatoes may be

stored in bins or in crates. Bins should be small enough to permit air circulation through the pile. Slatted floor and walls should be provided to insure good ventilation. Table stock potatoes must be stored in a dark cellar.

### **Pumpkins and Squash**

To store best, squash and pumpkins should be thoroughly mature (when it is difficult to puncture the skin near the stem end with the thumbnail). In harvesting, leave 3 to 4 inches of stem attached to the fruit. In handling, be careful not to break the skin. Such injuries provide open doors to disease organisms and are often followed by decay. After harvesting, keep the fruits at 75° to 80° F. for about 2 weeks to harden the shell. This often can be done by placing them in small piles in the field when the weather is warm and dry. If it looks like frost, cover the piles with vines. Do not expose to severe frosts. Then store them at 40° to 50° F. General storage is too cool and moist for them but an attic or furnace room often meets their requirements fairly well. Never permit the temperature to go below freezing.

### **Rhubarb**

Rhubarb may be forced in the home cellar. Two-year-old roots are usually used. Older roots often are used, however, when forcing is a sideline to outdoor production and also in home forcing. Dig or plow out roots just before the soil freezes and leave outside until they are thoroughly frozen. Freezing for two weeks at 20° F., followed by a dormant period of 4 weeks at 30°, where temperatures can be controlled, is effective. Roots left outside to freeze should be covered with moist soil or straw to prevent excessive evaporation.

The crop may be forced in cellars, hotbeds, coldframes, special forcing cellars, or in any place where the temperature, light, and moisture can be

controlled. Roots are placed close together on the floor and covered 2 to 3 inches above the crown with soil worked in thoroughly about the rhizomes and kept moist. A temperature of about 60° gives the best results. Forcing is done in the dark or, in some cases, in subdued light. Plants usually start to produce shoots in 3 to 4 weeks and continue production 4 to 5 weeks. It usually is best to discard roots after they have been used for forcing.

Rhubarb may be forced in the home cellar for family use. Fine ashes or sand may be used about the plants instead of soil. Four or five large roots will supply the needs of the average family. Subdued light may be obtained by placing paper over the windows. Near the furnace, the desired temperature of 60° may be maintained.

### **Rutabagas and Turnips**

Medium size rutabagas and turnips should be gathered for storage late in the fall and topped. Store like beets and carrots. Rutabagas retain their quality in storage longer than turnips.

### **Tomatoes**

The tomato season often can be extended for several weeks by picking fruits at the pink or hard-ripe stage or at the green-mature stage, just before the first fall frost that kills the vines. The pink or hard-ripe stage is just when the fruit starts to color. Just before the fruit starts to color, it tends to turn from green to a very light green or almost white color. This is known as the green-mature stage.

Tomatoes in the pink or hard-ripe stage can be kept in fair condition for 7 to 10 days at 40° to 50° F. Green-mature tomatoes can be kept from 1 to 6 weeks at about 50° F. Ripening progresses slowly at this temperature. If faster ripening is desired, they can be kept at temperatures of 60° to 70° F. but decay also develops faster. Since

the fruits do not all ripen at the same time and since some will probably spoil, place them on shelves not more than two or three fruits deep so that they can be examined and sorted readily.

### Apples

Conditions suitable for storing potatoes meet the requirements for apples fairly well. The fruits should be well matured and free from disease, insect, and mechanical injury when stored. Do not pile fruit deep. Storage in ordinary potato crates aids in the circulation of air through the fruit and provides satisfactory storage containers. Place apples in the storage cellar as soon as picked. They are not injured in storage by temperatures as low as 30° F. and keep well at 30° to 40° F.

### Herbs

At least a few herbs should be available for winter use. Most herbs are fairly easy to store and will retain their aroma or flavor for a considerable time. Some kinds may be potted for winter and grown as house plants.

Foliage harvested for storage should be cut just before flowering on a bright, dry day when the plants are in full growth, vigorous, and full of sap. They should be cut close to the ground, tied in bunches, labeled, and hung up to dry in a cool, clean, dry, dustless, airy room, such as an attic, and dried as quickly as possible. If desired, the leaves may be stripped off and dried in trays. When dry enough to crumble, the leaves, whole or finely crumbled, may be placed in wide-mouthed bottles or fruit jars, labeled, and tightly corked or covered. Look at the jars daily for a few days and if any moisture is present, remove the herbs and dry further. Herbs must be thoroughly dry to keep well. Sweet basil, hoarhound, marjoram, sage, thyme, balm, savory, tarragon, lavender, parsley, celery, dill, fennel, and mint are the herbs whose foliage is most commonly dried.

Herbs grown for seed should be allowed to ripen and then harvested just before the seeds start dropping. Place the seeds with other attached parts on a paper or cloth to dry. As soon as they are dry enough, thresh them out and remove the dirt and refuse. Then spread the clean seeds in thin layers on a cloth or paper until they are thoroughly cured. Store in glass jars. The conditions for harvesting, curing, and storing should be the same as those necessary for preserving the foliage. Among the herbs whose seeds are commonly used are angelica, anise, celery, sweet cicely, coriander, cumin, dill, fennel, lovagè, poppy (maw), and sesame.

Herbs that may be taken up in the fall, potted, and used as house plants include bush basil, chives, pot marigold, sweet annual marjoram, mint, parsley, rose geranium, rosemary, and lemon verbena.

## OTHER PRESERVATION METHODS

Corn, mature peas and beans, celery, parsley, chives, pumpkins, squash, and herbs may be dried readily in the sun, over the kitchen stove, or with specially prepared driers.

If properly canned, asparagus, beans, beets, carrots, corn, green peas, pumpkin, squash, and tomatoes provide excellent food for year-round use.

Often frozen vegetables closely resemble the fresh product in color, flavor, and cooking quality.

## REFERENCES

- The following Extension publications may be obtained from county extension agents or the Bulletin Room, University Farm, St. Paul:
- Folder 100, Home Canning Fruits and Vegetables.
  - Folder 111, Freezing Fruits and Vegetables.
  - Pamphlet 102, Drying Foods at Home.



### VEGETABLE STORAGE HINTS

1. Keep the storage cellar clean and sanitary.
2. Store the best vegetables. Late maturing varieties keep best.
3. Most vegetables store best in the dark.
4. Sort stored crops occasionally, removing all unsound vegetables.
5. Most vegetables should be protected from freezing. If insulation is inadequate, provide a little heat during severe cold spells.
6. Fruits and dairy products may absorb vegetable odors and should not be kept in the vegetable cellar.
7. If cabbages, rutabagas, and turnips produce undesirable odors, store them in an outside cellar or pit.
8. It is easier to maintain humidity with a dirt than with a concrete floor; avoid standing water.

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