Root Cellar Basics

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Root Cellaring: The Simple No-Processing Way to Store Fruits and Vegetables

By Mike and Nancy Bubel, Copyright 1979, Published by Rodale Press, Emmaus, Pennsylvania

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Cool and moist conditions are required for storing most vegetables. Because of this, when planning a root cellar, several things need to be taken into consideration.

Temperature is your most important interest: As your root cellar needs to be kept as cool as possible, there are several things you can do to promote this:

- First, borrow cold from the ground. Earth, even two feet down, gives a remarkable year wide temperature stability. The further down you go the better it is. You must go down a full 10 feet before complete temperature stability is reached. But for the average builder, how deep you go is limited because of expenses.
- You can also borrow cool from the air. Often the night's air temperature will be cooler than the air in your cellar.
- And finally, you should do what you can to prevent heat from having access to your cellar. This includes:
- Having your root cellar in the shade throughout the day
- Building on the north side of hills
- Wise use of insulation

Your second most important consideration is humidity. Even if kept cool, in a low humidity environment, your vegetables will soften and shrivel up. Most vegetables require high humidities. A typical underground root cellar will generally maintain a high humidity all by itself if it has an earth or dirt floor.

Air circulation: The best root cellars have vents (although none of the old cellars here in Southern Alberta I have seen have them). This is because the vegetables in your cellar give off gasses that often are conducive to either spoilage or sprouting. For example, apples naturally give off ethylene gas which makes potatoes sprout prematurely. (This can be used to your advantage if you have potatoes that are slow sprouting. Put'em both in a plastic bag.) Good venting fundamentals include:

- Have an inlet vent and an outlet vent.
- The outlet must always be at the highest level in the cellar with the outlet tube flush with the inner wall.

- The inlet should come into the cellar at the bottom. This is easily done if your cellar is built into a hill, but nearly as easy if it is buried in flat ground. With your inlet vent opening on top of the ground near your outlet vent, your inlet vent pipe must go all the way to the floor before opening into your cellar.
- Keep shelves a couple of inches away from the walls of the cellar. This will greatly promote circulation around the vegetables stored on these shelves.
- To prevent your potatoes from sprouting prematurely, keep your apples above them so the circulating air moves away from your potatoes.
- Have a system in place to close your vents in freezing weather. Something as simple as a big sponge can work for this. If you have very cold winters, you may wish to block off both ends of each vent pipe.

How big of a cellar should you build?

- A 5 foot by 8 foot root cellar will store 30 bushels of produce.
- An 8 foot by 8 foot cellar should hold plenty for the average family.
- A 10 foot by 10 foot cellar should take care of everything you can produce.

Shelves: We have already mentioned shelves should be kept at least a couple of inches away from the walls for increased ventilation. Other things to consider are:

- Use rot resistant or pressure treated wood. After several years they will be less likely to rot and break, tumbling your foods on the floor. (The book gave one example of a person who went down to her cellar one day to find a good share of her canned fruit and vegetables broken on the floor. As the lids on canned goods rust after a couple of years, plan a dryer, cool place for these items.)
- Liberal use of shelves will enhance the storage capacity of your cellar considerably.

What kind of root cellar is right for you? Here are some possibilities with a few advantages/disadvantages:

Build your root cellar into a hill.

- You don't have to find a door lying on the ground when it is under 3 feet of snow.
- There is less chance of flooding during very wet conditions
- Your cellar can be graded so any water that should run or seep in will run out the door.
- Can be much more difficult to excavate.

Build your root cellar on flat ground.

- Availability: not everyone has a steep hill in their back yard
- Easier to excavate
- Easier and cheaper to build (you don't have to brace your cellar for all that extra weight from the hill). But that added dirt will keep your cellar cooler!
- You can build a vertical door around a staircase if you don't want to be shoveling snow to get at a horizontal door.

Build your cellar as part of your house: Our house which is only one year old had a root cellar built into it when the house was constructed. Many older houses have a section of the basement that has an earthen floor. It's primary reason was probably for vegetable storage. You can also:

- Build and insulate a room in this area.
- Dig a cellar next to the house with an entry way to your cellar through the basement.
- Put your cellar in an existing underground structure such as a pump house.

Construction methods:

- Dugout: The cheapest way to go in stable soil

- Wood construction: Be sure to use pressure treated wood.
- Cement
- Floors
  - Dirt: the simplest way to go and excellent for humidity control.
  - Gravel: In a very damp or very dry area you will want to put down three inches of gravel. If your cellar is unusually wet, you may want to even dig a sump in the middle of your cellar floor and fill this with gravel, along with the three inches on the floor. In very dry soil conditions you can sprinkle water on the gravel which will greatly increase the evaporation surface area.
  - Wood: put gaps in your boards for a higher humidity cellar.
  - Cement: If you want a storage area that is lower in humidity, this is a good way to go.
  - You may wish to build two rooms in your cellar. One with a cement floor for lower humidity storage items, and another room with no floor for higher humidity storage items. If you did this, the wall between the rooms should be as air tight as you can make it. If you have a venting system, you should have a separate set of vents for each room. And lastly, the high humidity storage area should be the far room in the cellar.

Using your root cellar:

- Keep a thermometer and humidity gauge in your cellar.
- Keep the door(s) closed to your cellar as much as possible if it is warm outside.
- During the spring and fall of the year, open your vents (and even perhaps the door) at night when the temperature is dropping below the temperature of the air in your cellar. Close them early in the morning before the outside air warms up. (Be careful not to do this if the temperature is expected to drop below freezing.)
- If the humidity in your cellar is too low you can raise it by:
- Leaving at least the floor of your cellar exposed to the earth (a dirt floor or air gaps in your floor down to the earth).
- Sprinkle water on a graveled floor or lay out damp towels or burlap bags.
- Pack root vegetables in damp saw dust, sand or moss.
- One caution about high humidities: If you get much of a temperature fluctuation in your cellar, humid air as it cools past it's dew point will condense on the ceiling, walls, and produce. Excess water on your goods can induce spoilage. Cover vegetables with burlap, towels, etc. to absorb excess condensing moisture. Also, if your air is condensing inside, open your vents if the air outside is cooler than it is inside. Even if it is very humid air, as it warms in the root cellar, it's relative humidity will drop. Of course, the opposite can happen. If you let warm damp air in, moisture will condense out as it cools.
- During extremely cold weather, if your cellar is threatening to freeze, put a light bulb inside. If you do this, you need to cover your potatoes so they won't turn green. (Do not use a kerosene lantern. Kerosene lanterns produce ethylene, which is a fruit ripener.) Also remember that snow is an excellent insulator. Don't tramp down or remove the snow on top of your root cellar any more than you have to in order to gain entry.
- Keep a fairly close eye on your produce and remove any that has begun to spoil. (It is a true axiom that 'one bad apple with spoil the bushel.'

Vegetables and their optimum storage conditions

Cold and very moist (32-40 degrees F and 90-95 % humidity			
Carrots Beets Parsnips Rutabagas Turnips	Celery Chinese Cabbage Celeriac Salsify Scorazonera	Winter radishes Kohlrabi Leeks Collards Broccoli (short term)	Burssels Sprouts (short term) Horseradish Jerusalem artichokes Hamburg-rooted parsley

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Cold and Moist 32-40 degrees F and 80-90% humidity	**40-50 degrees F and 85-90 % humidity**	**Cool and Dry 35-40 degrees F 60-70% humidity**	**Moderately Warm and Dry 50-60 degrees F and 60-70% relative humidity**
Potatoes Cabbage Cauliflower (short term) Apples Grapes (40 degrees F) Oranges Pears Quince Endive, escarole Grapefruit	Cucumbers Sweet peppers (45-55 degrees F) Cantaloupe Watermelon Eggplant (50-60 degrees F.) Ripe tomatoes	Garlic Onions Green soybeans in the pod (short term)	Dry hot peppers Pumpkins Winter squash Sweet potatoes Green tomatoes (up to 70 degrees F is OK)