

SUSTAINABILITY LIVING GUIDE:

33. BUILDING A ROOT CELLAR

A root cellar is an easy, inexpensive and cool way to store root crops, winter squash and some other homegrown produce. A root cellar was an essential part of every home in the days before fresh produce was available in supermarkets year-round. (The root cellar was also the spookiest spot in most old houses.) A root cellar is still an easy, inexpensive and a cool way to store root crops, winter squash and some other homegrown produce. Even if you live in a newer house, you can still have a root cellar. The following are simple plans for transforming a corner of your basement into a root cellar, with a minimum of know-how and readily available materials.

Choose a damp spot. Most crops keep best in relatively high humidity. So build your root cellar in the dampest area of your basement (typically the sump pump is in the dampest corner). Next to an exterior wall. You want, if possible, to build on a wall that's below grade (underground), because you want the greatest contact with outside soil temperature you can get. If you need to use a wall that's above grade, be sure it doesn't get too much sun. (Use north or shaded walls.)

Allow For Ventilation

Without ventilation, your stored produce will spoil. To create good ventilation, you need to get two pipes through that outside wall—one at the highest point of the room. Both pipes should be about 3 inches in diameter. Try to pick a site that allows for this easily, such as one that includes a casement window or the like. Your vents can be made of just about any pipe or ducting. Plastic (PVC)—3 inch—is durable and easy to work with, and the valves you'll need fit right into it. Cut a length of the plastic pipe to reach through the wall. Cut the end straight. Slide a closed blast gate (valve) onto the pipe until it fits snugly against the end of the pipe just tight enough to impart a slight resistance. Use 3 or 4 screws to secure the valve to the pipe.

Now cut pieces of pipe for the other vent. This one can go through the wall just about anywhere; just add an elbow and a length of pipe running down the inside so that it ends up about a foot from the floor. Add another blast gate in that pipe. These two vents create a siphon. Cool air is more dense than warm air, and will collect in low spots. Anytime the air outside your root cellar is cooler than the air inside, the siphon will allow warm air to be drawn out and cool air to flow in. As outside temperatures fluctuate, you'll get almost continuous air change while keeping the temperature as low as possible.

Which brings us to the reason for the valves. If the temperature outside goes below freezing, you should close one of the valves to stop the siphon. You'll get some venting while keeping things from freezing. If the outside temperature goes way below freezing, you'll need to close both valves (at least partially). Seal the wall around the pipes with aerosol insulating foam. This will fill in any gaps and cracks, and once it sets, does a good job of holding your pipes in place, too.

Build the Walls

You could build the walls out of just about anything, but, due to the moist conditions, you should splurge on a handful of 2X4s made of cedar or other rot-resistant wood for framing, and some moisture-resistant wall board ("green board" sold for use in shower stalls). Nail a 2X4 to

the ceiling, fasten another to the concrete floor with a bead of construction adhesive (the kind in caulking gun tubes) and cut the studs to fit between them.

Cover the Walls

Put your gypsum board on the inside surfaces first. Once the inside panels are glued and screwed in place, stuff the cavities with fiberglass insulation and cover the outsides. With all of the coverings in place, get out the aerosol foam again and shoot it into all of the cracks—especially between your new wall and the (likely) ragged edges of the old walls. A root cellar does not need to be airtight, but the tighter it is the more control you'll have over the air quality and temperature. Plug as many gaps as you can.

Add the Shelves

Bear in mind that lower shelves will be cooler and wetter, higher shelves will be warmer and dryer. Arrange and space your shelves to suit the items that will likely be stored on them.

Hang a Door

You can use a ready-made door if you want. Or you can make it simply from quarter-inch plywood and hang it directly on the studs. One customizing touch worth considering is to make the door in two pieces. This way you can open the top half and grab a couple carrots without letting out the coldest, dampest air at the bottom of the root cellar.

Finishing Touch

Fasten a rod to the handle of each blast gate and run it through the wall into the basement. This way you can open and close the valves without opening the door and spilling the cold air. It also will allow you to see whether the valves are open or closed without opening the door.

Excerpted from Organic Gardening Magazine by:

Daniel Lousier, PhD

ADDENDUM #1

HOW TO SAVE MONEY, AND SAVE VEGETABLES, BY CREATING A SIMPLE ROOT CELLAR¹, by Emily Main[©]

If you're having a good year in the garden, have you thought about what you'll do with your harvest? Digging your own root cellar would give you the perfect place to store the bounty from your garden, or the seasonal bargains from your local farmer's market. If that sounds like too much work, don't worry: you can also find suitable space in your home, and have it ready for food storage in a matter of hours.

Root cellars, an often-ignored option for food preservation, are one of the easiest ways to store fresh, local food and save a few bucks in the process, says Barbara Salsbury, author of *Beating*

¹ Rodale Daily News, August 24, 2010

the High Cost of Eating: The Essential Guide to Supermarket Survival (Horizon, 2005). She converted an old closet near her kitchen into a makeshift root cellar, and uses it all winter. “When good yams, cabbage, and carrots, are cheap, I buy three pounds,” she says. “When there’s a sale on squash, I buy several, and they will last for an age.”

Produce stored in a root cellar can last anywhere from a few weeks for perishables like tomatoes and watermelon to months or more for root vegetables, apples, and onions. The good news: No matter where you live, there’s a good chance you have a potential root cellar undiscovered somewhere in your home.

There are essentially five key factors in a successful cool-storage operation:

- (1) **Find a spot that’s dark and cool.** Virtually any unused space can be turned into a root cellar, provided you keep out heat and sunlight. Salisbury uses a shelf in an unused cupboard, and stores overflow in her converted hallway closet. “It really does vary from household to household, depending on how well insulated a room is and where the heating vents are,” says Claire Morenon, program coordinator at the Massachusetts-based nonprofit Community Involved in Sustaining Agriculture. “It helps if there’s an outside wall,” she notes, to keep a space around 60 degrees. Even underneath a bed will work, just as long as there are no heating vents nearby, she adds. Close the heating vents and install a thermometer to monitor the temperature in your makeshift storage space. You can also try empty guest bedrooms, the bulkhead over your basement, a space beneath a porch (as long as the area stays above freezing), or even a garbage can buried in the ground outside (as long as the ground doesn’t get so cold you can’t dig it up).
- (2) **Minimize bruising.** Bruised fruits and vegetables rot more quickly, and “it helps slow down the spread of molds if they’re not touching each other,” says Morenon. Produce can also bruise if it’s resting on a shelf, so she uses a fabric shoe organizer to keep her squash from touching other squash. Another popular root-cellar trick is to suspend items in pantyhose from the ceiling or from shelves, or to pack them in sand, which also helps keep in moisture, the next thing you need to worry about.
- (3) **Keep it damp.** Not all stored produce needs dampness in order to survive. Pumpkins, sweet potatoes, winter squash, garlic, and onions prefer low humidity levels. However, cabbage, apples, carrots, and most of your root vegetables (beets, celeriac, turnips, and so forth) like moderate to high humidity levels. You can use a humidifier if you have one, but Morenon suggests storing those crops in boxes packed in damp sand. Or you can cover a box of potatoes or root vegetables with a damp towel. The key is to remember to check periodically to dampen the towel (or sand), so the vegetables don’t dry out.
- (4) **Sequester your apples.** “Apples can’t be stored with other vegetables because they release a chemical [ethylene gas] that rots other vegetables,” says Morenon. Keep those by themselves, under a bed or in a cupboard, where they won’t interfere with the rest of your produce.
- (5) **Dig a dirt hole.** If you really want the full-blown, hard-core root cellar experience, you can build a traditional underground root cellar that takes advantage of year-round soil temperatures of about 55 degrees F. Root cellars can be entirely underground or partially underground, but the partial cellars do best if the walls not in contact with the earth face north or are shaded. Support the root cellar with rot-resistant woods. Also, it’s important to

install ventilation, since stagnant air can speed up vegetable rot. For detailed instructions on creating an actual root cellar, visit *Organic Gardening* magazine.

ADDENDUM #2

WHAT TO STORE IN A ROOT CELLAR

Vegetable	Ideal Storage Temperature (°F)	Relative Humidity (%)	Average Storage Life
Beets	32	95	1-3 months
Cabbage	32	90-95	3-4 months
Carrots	32	90-95	4-6 months
Celery	32	90-95	2-3 months
Garlic	32	65-70	6-7 months
Horseradish	30-32	90-95	10-12 months
Jerusalem artichoke	31-32	90-95	2-5 months
Onions	32	65-70	5-8 months
Parsnips	32	90-95	2-6 months
Potatoes	38-40	90	5-8 months
Pumpkins	50-55	70-75	2-3 months
Rutabaga	32	90-95	2-4 months
Sweet potato	55-60	85-90	4-6 months
Turnips	32	90-95	4-5 months
Winter squash	50-55	70-75	3-6 months