

'ROOT SELLERS'

AND HOW THEY EXTEND THEIR MARKETING SEASON

By Av Singh

As more and more consumers become 'foodies' and are better aware of organic and local, a great distress arises as Indian summer fades, farmers' markets close and our CSA boxes stop delivery – *What do we do now?*

Spoiled by the freshness of our local organic produce of summer past, we look with disappointment down our shopping store aisles and turn over organic produce from Chile, South Africa, the U.S., China, and beyond...bring on the 100,000-mile diet.

Eliot Coleman and Barbara Damrosch, of Four Season's Farm in Maine, have specialized by marketing their products in the off seasons, much to the delight of chefs and consumers longing for fresh local produce. Increasingly, farmers and gardeners are looking at ways of extending their growing season and providing discerning consumers with freshly picked greens in the dead of winter through a variety of methods such as high tunnels and greenhouses (see pages 24–31).

Some foodies have taken the vow of eating seasonally and will gladly dismiss mesclun mix from California and wait until next spring. However they are quite disappointed to find that many of their typical local, seasonal vegetables (potatoes, onions, sweetpotatoes, garlic, carrots, beets, parsnips, rutabagas, squash, apples, etc.) have also travelled from exotic destinations that they only dream of travelling to. But why? Why does my CSA food box have to stop delivery in late October? There are a growing number of consumers ready to commit to paying for local, organic, and seasonal products...in come the *'root sellers.'*

Please...not another potato

For some, eating seasonally in Canada conjures up images of spuds, spuds and more spuds. Wolf Pine Farm in Maine offers a winter CSA share and, in addition to the occasional pint of blueberries, maple syrup and pumpkin pies, a typical January share may include:

apples	onions
basil (dried)	eggs
beets	garlic
cabbage	oats
carrots	potatoes
celery root	rutabagas
winter squash	

Check it out at www.wolfpinefarm.com. Just think...soon many CSAs in Canada will be offering similar shares.

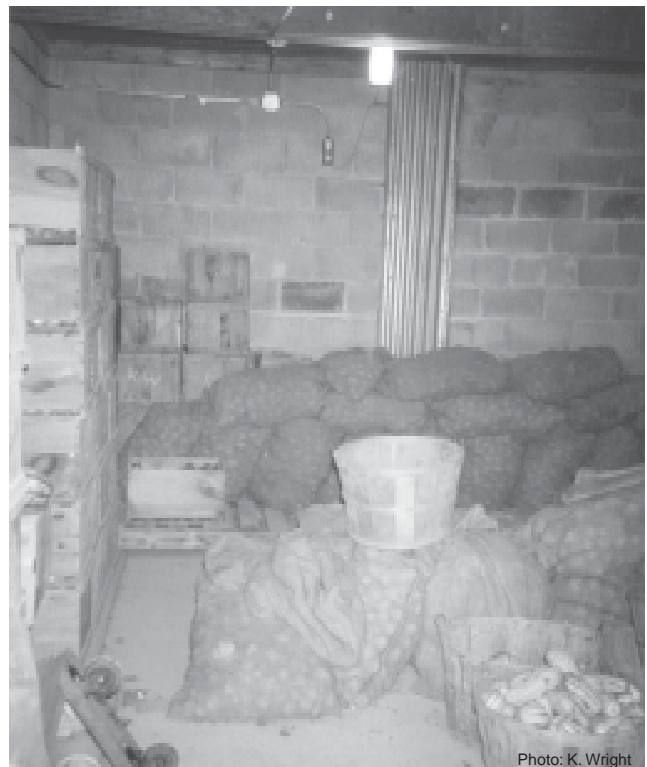


Photo: K. Wright

What are root sellers? Simply put, root sellers are farmers and gardeners who have designed their crop rotations to include a large proportion of winter storage crops and who store and market these products over the course of a long Canadian winter. Now, it really isn't as simple as I just stated. As with any crop production, each vegetable has its own unique growing requirements (i.e. fertility, soil acidity, pest management, etc.) which isn't the focus of this article, but please check out *TCOG* Fall 2008 for more information on root crop production. Each crop also has unique harvesting practices and post-harvest storing methods to ensure freshness and storability—which will be the focus of this article.

Root cellars: your secret underground garden

Anything that grows underground will store underground. That's the motto for many gardeners as they harvest their carrots and rutabagas as needed by clearing off the snow and mulch, and then digging into the soil to retrieve their bounty. Unfortunately, for many growers in Zone 6 and below, access to their produce still in the ground during the winter

becomes near impossible because of snow and/or because the soil freezes. (Freezing affects the quality of root crops with the possible exceptions of parsnips, salsify and Jerusalem artichokes which seem to get sweeter over winter.)

Anything that grows underground will store underground.

For greater consistency and quality control, backyard gardeners to large-scale market growers have turned to root cellars for their winter crops. The ideal root cellar is dark, and one in which you have temperature and humidity control. It seems simple (only two variables), but it does get confusing when you consider that different crops like different environments (e.g. cool and dry; or cool and humid; or cold and dry; or cold and humid).

Basements, garages, barns, or the northside of a hill or berm are ideal spots for root cellars. With creativity and experimentation, root cellars can provide a variety of environments allowing you to store all of your produce under one roof. You don't need expensive refrigeration equipment to

create cool conditions. Cool air can be gained by digging into the ground or by capturing cool nighttime temperatures. Ideal temperatures for most root cellar crops range between just above freezing to 4°C.

Temperature control can be easily managed by having a cool air vent at the bottom and a warm air vent at the top, both of which can be opened and closed. Such a system also promotes adequate air circulation to reduce the chance of disease and ventilates gases (e.g. ethylene) that are released in the ripening of many crops. For those crops requiring slightly warmer conditions, a portion of the root cellar could be insulated, while still having vents to mediate temperatures. To avoid spoiled produce, temperatures must be monitored using a thermometer.

The ideal root cellar is dark, and one in which you have temperature and humidity control.

Playing the guessing game on temperatures often leads to slimy potatoes and cabbages that were damaged when temperatures dipped below the freezing point.

Have you ever grabbed a carrot that has more wrinkles than a prune? Not overly appetizing and probably one of the main reasons many of us turn to the grocery aisles in mid-winter and look longingly through shiny plastic at those beautiful, hard, wrinkle-free carrots from Arizona. But, it doesn't have to be that way...we just need to control our moisture level in storage. Many crops like

Garbage can root cellar

If your winters are relatively mild, the simplest root cellar can be a galvanized garbage can in your backyard.

- Bury a can with about 4 inches (10 cm) of the can above the soil surface.
- Place root crops with similar storage requirements in can.
- Secure garbage can lid,
- cover lid with straw, and
- cover straw with a waterproof canvas or tarp.

it moist with relative humidity levels approaching 90–95%.

Getting humidity in the air can be as simple as watering the floors, leaving a few buckets of water out, or having a dirt floor. Some growers store produce in burlap, sand, sawdust or peat moss (try coconut fibre coir...it may be more sustainable), and mist their produce occasionally. Once again, don't rely on that arthritic knee to tell you the humidity levels; get a humidity monitoring device (hygrometer) to ensure your produce isn't going to shrivel up.

Darkness is essential for many of these subterranean crops and works well for brassicas (e.g. cabbage), squash and apples. Many root crops are biennials and light is a trigger for them to sprout and begin to grow. The growth expends energy and, in doing so, degrades flavour. In the case of potatoes, a poisonous compound (solanine) is produced when potato skin turns green after being exposed to light.



Under cold and very moist conditions, beets can be stored for several months.

Photo: K. Wright

From the ground down: vegetables and optimum storage conditions

The GIGO principle (Garbage In/Garbage Out) applies when talking about root crop storage. When you are harvesting crops, it is imperative that diseased and/

or damaged crops be segregated—the axiom of one rotten apple is true. Other key factors in ensuring better shelf life of many winter vegetables is the post-harvest handling and curing process.

Cold (2°C) and very moist (90–95% humidity)

Carrots are often harvested before the first frost making it easier to pull them out of the ground and somewhat easier to remove their tops. Ideally carrots are stored layered with peat, sand, moss or burlap to prevent them from touching each other.

Beets are best when they reach 1.5–3 inches (4–8 cm) in diameter and will deteriorate two weeks after they reach maximum size. Ideally, beets are hand pulled to avoid bruising, and the soil is shaken off. Beet tops are twisted off (in favour of cutting) leaving about an inch of stem which deters bleeding. Best storage practices



A variety of carrots grown at Everdale Farm.

Photo: G. Dandy



Leeks prepared for winter storage.

Photo: J. Wallace

for beets are similar to those of carrots.

Leeks can be stored as harvested plants or as whole plants re-potted in your root cellar. Leeks will store well when kept in cold environments with high humidity (95%).

Parsnips are best harvested after a hard frost, which brings out their sweetness. Dig and store like carrots—or mulch with a thick layer of hay and harvest as needed, but make sure you harvest before next spring's regrowth or their flavour will spoil.

Rutabagas can benefit from light frosts, which improve texture and sweetness, but a freeze will shorten their shelf life. Tops are often cut off and the roots are not washed before storage.

Turnips are harvested much like beets in terms of both the ideal size and method of stem removal. Turnip storage is enhanced by not washing soil off the crop.

Jerusalem artichokes are often harvested after the aboveground foliage has died off (usually after a few frosts). Jerusalem artichokes are thin-skinned and therefore require high humidity to prevent shrivelling. They also do well overwintering in the ground and can be harvested in the early spring.

Cold (2–4°C) and moist (80–90% humidity)

Potatoes are often harvested soon after the first killing frost and are quickly dusted off and dried while ensuring minimal exposure to sunlight. Potatoes require plenty of air circulation, so they should



Jerusalem artichokes.

be packed loosely in wooden or cardboard boxes with perhaps newspaper on top to keep them completely in the dark.

Cabbages can be harvested by pulling the entire crop out of the ground—roots and all. The plants can be hung from the roots in a damp cool storage room. This method may allow you to force the cabbage to give you new growth if you cut off the cabbage, re-pot the roots and expose the plant to



Garlic curing.

Photo: J. Wallace



Onions curing in the sun at Everdale Farm.

light. Forcing can also be done to produce winter greens. Beets, onions, celeriac, turnips and others can be pulled out from the root cellar, potted like they were bulbs, watered and exposed to sunlight. Soon, new leaves will appear for a winter harvest.

Apples break down rapidly if not properly stored. Ideally, temp-

eratures just above freezing will keep apples at their best. They should be stored loosely in cardboard or wooden boxes that allow for good air circulation. Late fall apples tend to store better than summer apples, and sour varieties like McIntosh and Granny Smith are easier to keep than more sugary varieties like Honeycrisp.

Apples and potatoes make strange bedfellows

Despite having similar storage conditions, potatoes (apples of the earth) don't store well in the vicinity of their namesake. During ripening, apples release ethylene gas which can initiate sprouting in potatoes. Ethylene production is also common in tomatoes and many tropical fruits.

Injury that can occur to vegetables sensitive to ethylene include:

- increased toughness in turnips;
- bitterness in carrots and parsnips;
- accelerated ripening in acorn and summer squash;
- yellowing in cabbage and cauliflower; and
- off-flavouring in sweetpotatoes.

If you have to store apples in the same area, keep apples at the top near the vent so they can off-gas.

Cool (2–5°C) and dry (60–70% humidity)

Onions are ready to harvest when their tops turn yellow. At this time, it is best to bend the tops down as this diverts the sap from the leaves into the bulbs. In a few days, the folded tops will turn brown and the onions are ready to be harvested. Onions can be pulled or dug from the soil and should be left to dry in the sun. For best results, onions in the curing process should not be dampened by the evening dew and should be brought under shelter at night. The entire process can take up to a week in sunny weather and longer if it is cloudy or cool. The onion is cured when the neck is dry and shrivelling. As with all of these winter vegetables, onions do well stored in the dark and do best when stored off the ground. Hanging onions in mesh bags in root cellars works well.

Garlic harvest is a fine art. Harvest too early and you lose on size. Harvest too late and the outer lining may tear resulting in poorer storability. The garlic curing process takes more time than onions. Many growers hang garlic for a few weeks in the upper lofts of barns that are dry, dark, hot and airy. Once cured, garlic roots are trimmed and the neck removed unless braiding is desired. Garlic is often kept by storing bulbs in paper bags in the root cellar.

Warm (8–15°C) and dry (60–70% humidity)

Winter squash will taste bland and watery unless you let it fully ripen on the vine. It is best to harvest winter squash before a frost. To harvest, use a sharp knife to cut the squash off the vine; leave three

inches of stem. If the stem is damaged, the fruit will most likely spoil. Winter squash should never be washed before storage. Harvested squash must be allowed to cure in the sun until the stem turns grey and shrivels up. Note that acorn squash does not require curing.

Sweetpotatoes increase significantly in size and vitamin content the longer they are kept in the ground, however if a frost blackens the vines, the tubers should be harvested as soon as possible. Sorting sweetpotatoes prior to storage is critical.

In our short Canadian summers, sweetpotatoes often experience chilling injury when soil temperatures drop below 10°C. The injury creates soft

brown spots on the flesh which eventually turn the sweetpotato to mush. Often the most costly part of growing sweetpotatoes is the curing process. Ideally, sweetpotatoes should be cured in a well ventilated, humid environment with temperatures reaching 27°C for about two weeks. Sweetpotatoes, once cured, store well in a dark cupboard of a kitchen pantry.

Getting deeper with roots?

Two excellent resources (both available through the COG library) about season extension and root cellaring are:

- 1) *Four Season Harvest*. Eliot Coleman. Chelsea Green Publishing Co. 1999.
- 2) *Root Cellaring: Natural Cold Storage of Fruits and Vegetables*. Mike and Nancy Bubel. Storey Books. 1991.

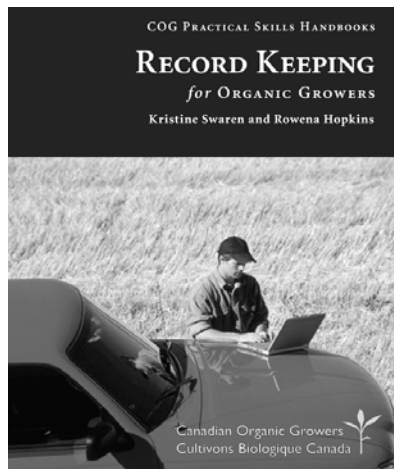
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Many farmers ... are looking to grow storage crops and offer winter shares of vegetables from their root cellars.

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Many farmers have extended their growing seasons by offering salad greens in the winter months, but others, including CSA growers, are looking to grow more storage crops and offer winter shares of vegetables from their root cellars. These root sellers face many challenges in ensuring that the freshness from the field is maintained until it reaches the dinner table months later. But those who can rise to the challenge will be able to extend their marketing opportunities and capture a greater proportion of the consumer dollar.

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