

Crop Diversity in Winter Storage at Kilpatrick Family Farm

Michael Kilpatrick

518-300-4060

Michael@kilpatrickfamilyfarm.com

Kilpatrick Family Farm is a year-round mixed vegetable farm. Our main markets are year round Farmer's Markets and CSA. Over the years, we have experimented with pushing the crops we go to see just what can be done. We run 5 distinct different environments for winter crops. This allows us to tailor the environment for the many different crops we grow.

Root cellar (34 degrees, 95% humidity) This is the main storage facility on the farm. A 40' X 8' x9' insulated overseas shipping container with stainless walls and aluminum slated floor, it holds up to 18,000 lbs of crop. We spent around \$15,000 buying the container, installing it on a shale pad, and installing refrigeration and electric. To maintain organization in the cooler, we put all crops on pallets, and fill out a grid chart that is shared with all employees. The cooling system is a 3 HP Trenton compressor with 2 evaporation units. If we had know we would have employed a low velocity evaporation unit to reduce moisture loss. Right now our humidity system is "man with hose" but we would like to install a misting system at some time.

Our warm storage area is an unused, insulated garage under our apartment. It has a cement floor that allows us to move stacks of bulk crates of squash and sweet potatoes around with a pallet jack. We regulate the humidity and temperature very unconventionally through opening and closing an inside door or outside window. Our goal is to maintain a temp of 55 in this area.

We store our onions and garlic currently off-farm in a rented 8x14 cooler. It is managed as a low humidity cooler by draining all evaporator drainage into a closed container and limiting visits. We are currently building our own onion storage facility by walling off a section of another insulated shipping container and installing a coolbot.

All of our prepped crops and second vegetable storage is in 2 coolers located in our washing shed. We will also store extra storage greens (greens cut in Nov/Dec and stored for up to 8 wks) in these coolers when we run out of space in our root cellar. We built our main cooler (8X11) out of used cooler panels and a used compressor. We added onto the backside of it 4 years ago for the second cooler (8X8) buying some "second" insulated structural panels from winter panel company out of Brattleburo, VT. They come in 4' widths in varying lengths and at the time ran around \$2 a square foot. We cut 2 12" by 6" holes in the shared wall between the coolers and consequently the new cooler runs around

10 degrees warmer than whatever we set the main cooler at. We use the second cooler in the summer for storing tomatoes, peppers, and cukes.

The last area we use to store overwintered crop is directly in the ground. We have successfully over-wintered parsnips, carrots and Jerusalem artichokes this way. Carrots do best with at least 2 layers of rowcover, while JA's and Parsnips are fine with no cover. All of these crops do best when they are on raised beds, out of any danger having saturated soil. Last year, we did have quite the problem with carrot rust fly in our over-wintered carrots and parsnips. We're not sure if it was overwintering that did it, or just the season.

Storing greens was something that we almost discovered by accident. We had several beds of beautiful spinach in the field in December and cut it all to use for the next several markets. We ended up keeping some for 6 weeks. We have found a variety of factors contribute to greens that store well.

A later, high quality planting. This allows for the crop to be in the prime of growth and to want to hunker down and go into hibernation for the winter. They then seem to fill their leaves with sugars, antifreeze, and carbohydrates and thus produce a very sweet, long lasting, durable leaf.

Cutting at a low temperature and immediately getting it into good cold (34) storage. We do find that if spinach has some snow in it, it seems to keep better. We have successfully done this with spinach, lettuce, kale, brussel sprouts, Chinese cabbage, boc choi, hakuri turnips with greens, and mesclun.

We will be trying this with mache, and working to improve our system with the other greens this year. This technique allows us to bunch our greenhouse greens up for the really cold months of January-March and allows us to sell high quality, sweet, relatively inexpensive to produce, greens for the high paced, busy, Holiday markets.

Washing Roots and winter crops

We have several different ways we clean the crops we send to market. Our major root washer is a barrel washer, although we use several different methods to make sure the crop looks amazing.

Our carrots, beet, potatoes, radishes, kolrabi, celariac and most other hard winter crops go through our barrel washer. Several things to keep in mind when building or buying a washer. You want a good water flow over the vegetables- this helps to keep the dirt moving through the pile of crop in the washer away from the crop. We also put various small wood slats inside our washer to increase the tumbling effect of the crop, this helps to polish and clean the crop better. We have a inflow shoot and outflow stop gate to keep the proper amount of crop in. (we're looking at around 200 lbs in at any one

time). One end of our barrel washer is on a hoist so that we can raise and lower it to adjust the rate the crop travels through the washer. We also set up a outflow table to sort crop on before it goes into market bins. Our barrel washer is from grindstone farm in central NY but several places also manufacture them in the midwest too. We have set up spray hoses at each end of the washer to help wet the crop down consistently.

Our onions and shallots go through our onion topper. We purchased it from roeters in Michigan and mounted it on a trailer so we can tow it out to the fields. This allows us to do an initial cleaning and leave the tops in the fields. We will then run them through again right before we send them to market to shine them up and clean off any left on top.

For crops like cabbage, leeks, brussel sprouts, and kale, we store them dirty out of the field and then just hand clean them up before market. This usually involves just cleaning up the outsides of the cabbages and brussels and removing dirt and junk from the leeks.

Without the storage facilities we have made the effort to perfect we wouldn't have anywhere close to the diversity that we are able to display at our weekly markets. Please follow the below URL or scan the QR code to access the custom resource page which has much more information on varieties, dates of planting and harvesting, storage, the presentation slides and other relevant resources.