**Challenge:** Adapting infrastructure to keep pace with rapidly growing farm production needs

**Solution:** Adapted an old dairy barn, and then built new flexible processing and storage space

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**Farm:** Jericho Settlers Farm, Jericho, VT

**Operators:** Mark Fasching and Christa Alexander

**In operation since:** 2002

**Size of farm:** 150 acres, 30 acres in vegetable production

**Markets:** 50% Direct Market (CSA, Farmstand), 50% Wholesale

**Number of farmworkers:** 15 at peak

**Approximate renovation costs for old barn:** $100,000

**Approximate cost of new 44’ x 84’ x 17.5’ barn shell:** $200,000

**Construction time of new barn:** 1.5 years

**Type of wash system:** Leafy greens-double rinsed in dunk-tanks; root crops in barrel washer
GENERAL DESCRIPTION

The evolution of Jericho Settlers Farm’s wash-pack area tells the story of one farm’s growth from a small-scale produce operation to a much larger diversified farm. When Mark Fasching and Christa Alexander started farming in 2002 on the land on which Christa grew up, they had access to an old dairy barn - half of which was being used by Christa’s sister to keep her horses. At that time, they sold their vegetables from a roadside stand at the farm.

Fourteen years later, they now raise over 75 types of certified organic vegetables and seedlings, pasture-based eggs, chicken, beef, lamb and pork. They’ve had to constantly improve and expand their wash/pack area infrastructure to keep pace with these expansions in production, enterprises and markets. After years of collecting equipment in anticipation of the day when they would have a larger space, in 2015 Mark and Christa built a new 84’ x 44’ barn to meet the processing and storage needs of their growing business.

PHASE I (2002-2010): Turning the old barn into a wash/packshed: When they began farming in 2002, Mark and Christa’s first step was to pour a cement floor and add a stand pipe for drainage in one half of the old dairy barn and use that for all of their washing and packing. Before long they outgrew that space, expanded into the portion that had been housing horses, and added a Coolbot-run cold room. Soon after they added a second cooler and separated vegetable and animal products between the two cold storage areas. Over their first 8 years in operation Mark and Christa made a number of improvements to the barn, including adding a plywood ceiling with overhead lights and washable wall coverings to make the processing areas more cleanable. They still washed produce in Rubbermaid stock-tanks and their loading dock was a dirt berm which made it challenging to load trucks efficiently.

PHASE II (2011-2015): Adding a dedicated egg room, loading dock and larger cooler: By 2011, they turned the room they had used for everything the first four years into a dedicated room for washing and packing eggs, which gave them peace of mind about reducing the potential for cross-contamination between animal products and vegetables. By now, their winter growing and year-round markets had expanded greatly, creating a pressing need for more storage space. With a line of credit from their local bank, they built a new addition that included a loading dock and a third cooler. This allowed them to have zoned storage. The loading dock provided room for a stainless steel triple-bay sink, greens spinner and barrel root washer. But even with this...
additional room, they quickly found space at a premium on days when the root washer was operating and bags of root crops were waiting to be loaded. While saving them time on labor, each new piece of equipment required room, and two years after building the addition, Mark and Christa had already outgrown the new space.

**PHASE III (2015): New Barn:** The latest improvement that provided the farm with the needed space to grow their production happened serendipitously. Always on the look-out for used equipment, Mark was dropping off some livestock at a slaughterhouse one day when he noticed a large cooler in storage. It was a huge dissembled walk-in from a Costco. Mark asked if he could buy it and cut it into two shorter structures. But then he needed a structure to hold his two new coolers – thus a beautiful new 84' x 44' pack-shed was born! Half of the trusses for the packshed came from another opportunistic find: a disassembled barn from a nearby farm that some local builders had on hand. Mark and Christa purchased additional trusses to match these and extend the length of the building. Large garage doors are located on center of either side of the building to allow for drive-through, cool the building in the summer and allow floors and surfaces to dry more quickly. The cooler compressors are located on top of the smaller cooler where heat from both compressors can be directed into the room behind the them. This room then acts as a warm room for curing squash and sweet potato, and for storage.

Each new expansion has opened the way for new pieces of equipment – having the tall cooler in the new shed means they need a forklift in order to stack bins and make full use of the additional height.

Fortunately, Mark had been collecting good, used equipment for years as he knew that they would need it someday. Now the day has arrived and they already have many of the machines and stainless equipment they can finally use in this larger space.

Jericho Settlers Farm's root crops and greens processing are mechanized from harvesting to washing. The machinery saves time and labor, allowing them to increase production. The old dairy barn is still dedicated to egg washing and storage on one side, the other side will be used primarily as a dry pack area for retail sales (bagging greens, roots, etc...). The old barn also houses freezers for meat storage, tools and space for the crew's personal belongings.
WHAT WORKS WELL

The large open shell structure gives flexibility to grow into the space as their needs and equipment evolve. It allows us to work multiple types of wash lines by having equipment on wheels, so we can move things in and out of the work areas as needed.

Tall windows on the south side of the shed capture the low angle of the sun in the winter: Abundant natural light from the high windows helps to keep the space well-lit and warm during the colder months. Good lighting is essential for quality control when processing vegetables.

Large bay doors are strategically placed for loading and unloading trucks and for maximizing air flow through the building for cooling and drying during the summer.

Adequate drainage that can be cleaned out: the new barn has a 30’ x 1’ drain that runs down the middle of the barn with the floor on either side sloping towards it. “The drain was sized to be wide enough for a shovel to easily fit inside. The entire grill can be easily removed and there is a stand pipe that allows sediment to settle and be reclaimed.”

Power and water drop down from the ceiling: That way workers are not at risk for shocks from getting wires and outlets wet and they are not dragging the ends of hoses around on muddy floors risking contamination or tripping over them.

WHAT COULD BE IMPROVED

Larger diameter plumbing for water needs: “Our waterlines reduce down to the standard ¾” waterpipe as the mainline enters the new building underground. I wish we had kept the 1.25” diameter for the main waterline from the well all the way into the building so we could have at least one larger diameter pipe in place for rapid filling of bulk tanks, etc. during washing.”
## Costs

### Cost Components: Renovations to Original Barn

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>New concrete floor in egg room and veggie room</td>
<td>$11,000</td>
</tr>
<tr>
<td>Plywood covering for ceilings, door framing, insulating, foundation repair</td>
<td>$13,000</td>
</tr>
<tr>
<td>New wiring/subpanel and generator hookup and fluorescent overhead fixtures</td>
<td>$4,000</td>
</tr>
<tr>
<td>Triple-bay stainless sink</td>
<td>$85</td>
</tr>
<tr>
<td>Loading dock: foundation, frame, insulation, garage door, doors &amp; windows,</td>
<td>$29,000</td>
</tr>
<tr>
<td>wiring/ plumbing</td>
<td></td>
</tr>
<tr>
<td>New large cooler</td>
<td>$29,000</td>
</tr>
<tr>
<td>Industrial greens spinner</td>
<td>$400 (used)</td>
</tr>
</tbody>
</table>

### Cost Components: New Packshed

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used Costco cooler</td>
<td>$2,500 and $4,500 for doors and iron supports</td>
</tr>
<tr>
<td>Grate and PVC for long drain</td>
<td>$200 (local metal shop made the grate)</td>
</tr>
<tr>
<td>Tall windows</td>
<td>$1,400 (used)</td>
</tr>
<tr>
<td>Durable fabric walls</td>
<td>$850 (Farmtek)</td>
</tr>
<tr>
<td>Insulation batting in walls and blown in cellulose in ceiling</td>
<td>$2,200 walls, $3,000 ceiling (includes labor cost)</td>
</tr>
<tr>
<td>Insulated R18 garage doors with 4 lights each</td>
<td>$4,000 total</td>
</tr>
</tbody>
</table>

Any reference to commercial products, trade names, or brand names is for information only, and no endorsement or approval is intended.

## Advice for Other Growers

**Invest in a concrete floor and have everything on wheels:** Once you have a concrete floor you can have items on wheels, which will greatly increase the flexibility of the space and the ease of moving things around, washing down surfaces and keeping things clean. You do not even need walls – you can just have a tent.

**Think like an old person and let equipment do the work for you, rather than wearing down your body.** As the farm has grown, Mark and Christa have increasingly moved from doing everything by hand to using machines to do the work for them. But Mark emphasizes that growers don’t have to invest in large, expensive pieces of equipment to save their bodies and be more efficient: “Even something simple like a hand truck can make a big difference. Just remember that more mechanization allows you to grow and process more crops, which means you may soon need more space!”

**Bring in maximum amperage allowed:** “When you are digging trenches for utilities, dig one trench for power, cable or internet, phone, drainage pipe, anything you can think of, and make the power for the maximum amperage allowed.”

**Insulate under the concrete for all heated workspaces:** “One layer is good, two layers are better!”

**It is cheaper to build up than out:** The new barn is tall – but the vertical space is not wasted as the farm’s offices are in a loft in the new barn. “The tall building height allows for vertical storage (via pallet racking or similar stacking) both in the coolers for crops, and in the wash area for supplies and equipment.”

**Two separate coolers:** “Having the two coolers in the new barn makes fall harvest and subsequent winter root washing very efficient. We are able to fill one cooler completely with bins of dirty crops as they come in from the field, and the second cooler holds all the washed/finished crops ready for sale. This means we can move things around a lot less, can access the crops easily when we need them, and reduces the pressure to get a lot of crops washed as they were being harvested and loaded into the cooler in the fall.”

**Pick up stainless steel sinks and tables when you see them:** Because stainless equipment is much more durable and easier to clean than other materials, if you have the storage space, it is worth grabbing it when you come across it. “You might not be able to use them now, but you will probably be expanding and find a use for them before too long.”