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Crops, advantages and timing for caterpillar tunnels vs greenhouses

Exploring our love/hate relationship with caterpillar tunnels

By Catherine Sylvestre

It's January 2022. We've just returned from our annual winter vacation. No one has set foot on Ferme des Quatre-Temps farm for three consecutive weeks. The first thing we see when we arrive at the site is the row of ten caterpillar tunnels.

I'm expecting to see empty tunnels with their polyethylene neatly rolled up on top of the hoops. What I see instead: three tunnels collapsed under the weight of snow and the action of high winds during a winter storm. Several of the other tunnels have accumulated water in their plastic and are threatening to give way.

All rested and disconnected from farm worries, my team and I were expecting a slow morning, touring our winter crops and planning the week to slowly restart our activities on the farm. I was particularly excited to start our tomato seedlings in the nice warm nursery. But we now find ourselves more concerned than we'd like to be. We have to tackle the disastrous caterpillar situation and start repairing what we can.

Hands frozen from working outside in the middle of January in Québec, we question the use of the caterpillar tunnels as we look at our greenhouses, which are proudly standing upright and haven't moved an inch in all the bad weather.

This is a bittersweet reflection, because when things are going well and the weather is kind, we really appreciate the simplicity and minimalism of our caterpillar tunnels.

Caterpillar tunnels can help keep the worst of the winter weather off at a lower cost per square foot, though they are not as sturdy as greenhouses.

This is all to say that we have a love-hate relationship with caterpillar tunnels at Ferme des Quatre-Temps. We like them for their low cost and their ability to increase the farm's covered area without requiring the construction of additional greenhouses. However, our appreciation for them decreases due to their fragility, susceptibility to collapsing under the weight of snow, and the fact that they

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Even when there's snow on the tunnel, crops are spared the worst of the weather.

are not automated, requiring daily opening and closing on sunny days.

Over the years, we've tried different models and different techniques for using them, always trying to find the magic formula to gain all of their benefits and decrease their flaws. Here's a summary of our adventure into the world of low-cost structures, and a perspective on where we are now.

Homemade caterpillar tunnels

The initial idea behind the caterpillar tunnels was to build them at the lowest possible cost in order to make growing under cover accessible to as many market gardeners as possible. To make them, we bought metal tubes which we bent using a hoop bender from Johnny's Selected Seeds.

The advantage of these early tunnel designs is their low cost. However, this model requires a joint between two pipes on each arch, thus weakening the whole structure. It is also less resistant to wind and snow.

With this homemade structure, the anchors are moveable, consisting of metal rods into which the hoops are inserted. The idea behind these moveable anchors was to enable the structures to be moved easily. The production technique to use them is as follows:

#1 APRIL: Construction of the caterpillar tunnels in spring to cover the early crops (green onions, lettuce, fennel, kohlrabi, bok-choy, etc.) in the field.

#2 END OF MAY: Once the early crops have reached 75 percent maturity and temperatures are sufficiently warm, move caterpillar tunnels and plant warm crops in them (tomatoes, peppers, eggplants). Early crops finish growing without protection, but are already well ahead of schedule compared to uncovered field crops.

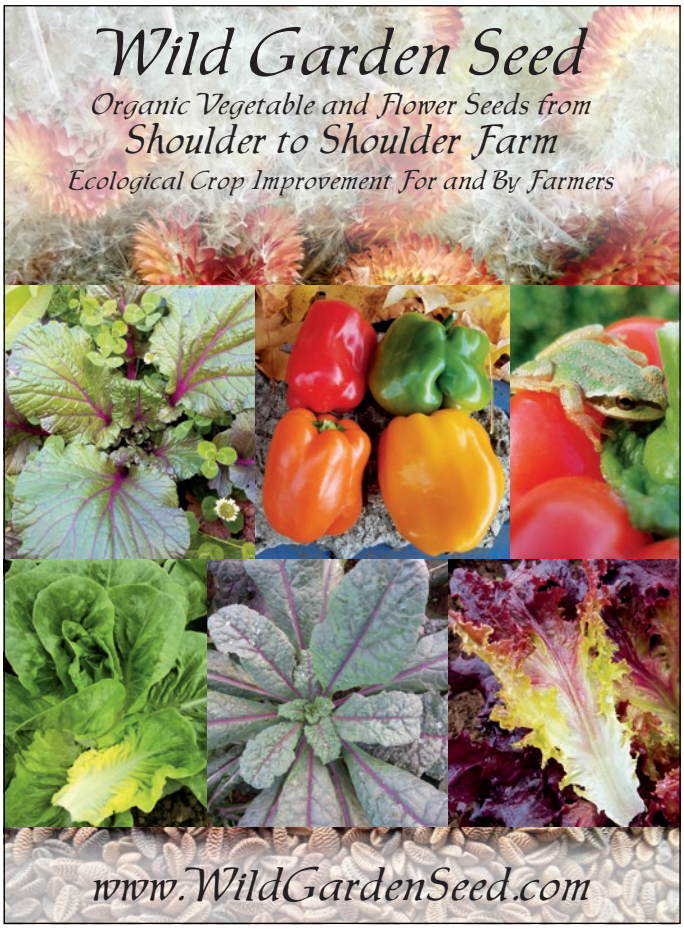
The advantage of this strategy is that few structures are needed and crop rotation is possible. However, the disadvantage is that it generates a lot of work to move the structures each year, and the fact that the anchors are not permanent diminishes their robustness.

After several years of using this low-cost solution, we experienced a number of disasters due to the fragility of these homemade structures. This uncertainty and lack of simplicity convinced us to try a new solution.

Fancy and robust caterpillar tunnels

To avoid yet another field full of collapsed, wind-blown structures, we turned to sturdier caterpillar tunnels. We opted for Multi Shelter Solutions caterpillar tunnels. What convinced us to try these tunnels were their sturdy hoops formed from a single piece of very thick metal.

Another notable benefit lies in the permanent anchoring of these tunnels, enhancing their resilience against strong winds. However, this has forced us to change our strategy for using caterpillar tunnels: it is no longer pos-



sible to move a caterpillar tunnel to heat-loving crops after covering spring crops.

To cope with this new reality, we had to adapt our crop calendars to ensure that early crops reach maturity in the caterpillar tunnels before the planting date of the heat loving crops. The process of achieving this crop planning goal is quite simple: we only plant early crops in the caterpillar tunnels whose days to maturity (DTM) are 50 days or fewer. We also start them in the nursery before planting to reduce their days in the field as much as possible.

This solution is quite satisfying, as it reduces the effort needed to move structures and minimizes unexpected weather disruptions, adding a sense of predictability to our work. It's certainly a bigger investment, but after three years of using sturdier structures, we can confirm that it's well worth the cost.

How to get the most out of caterpillar tunnels

To maximize the use of caterpillar tunnels on the farm, they should be filled with three crop successions per year:

#1 Early spring crops (April 1 to May 30): Radish, dill, coriander, Hakurei turnips, lettuce, kohlrabi, salanova, Bok-choy, and spinach.

#2 Heat loving crops (May 30 to September 15): Tomato, eggplant, peppers, and hot peppers.

#3 Cold-weather extension crop (September 15 to December 10): Spinach, Salanova or other lettuce, bok choy, dill, coriander, Hakurei turnips, Tokyo Bekana Chinese cabbage, kale and arugula.

By respecting this sequence of crops, caterpillar tunnels are used to their full potential and always have a growing crop inside.

A layer of row cover inside can help crops survive very low temperatures and the drying effects of winter wind.

Note that full winter growing — meaning growing vegetables from November to April — is not possible in northern regions with current caterpillar tunnel struc-

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(Left) Caterpillar tunnels can be vulnerable to getting crushed by a lot of snow or high winds. (Right) If plastic is rolled with the opening facing upwards, it can fill with snow and ice.

tures; the farther south you are, the more you will be able to grow through the winter, depending on your conditions. For this reason, the sides of the tunnels have to be raised during the winter and tied to the top with ropes. This strategy avoids having to completely remove the plastic from each tunnel during the winter, a task that requires a great deal of time and effort.

When carrying out this task, the most important thing is to focus on not creating any gaps where water can seep through and collect in the plastic. To do this, make sure you place the ends of the plastic toward the bottom of your "roll" and not toward the top.

The future of caterpillar tunnels

While we're happy with our current installation of caterpillar tunnels, we're always looking at what's new on the market. We have noticed that Tessier Greenhouses is offering a new tunnel that looks interesting for winter production.

A new tunnel is Gothic in shape, which means that snow falls more quickly down the sides, making it harder for it to accumulate and cause the structure to collapse. For this reason, it seems that these tunnels have the potential to be used for year-round production in Nordic settings. They enable the cultivation of highly cold-resistant crops during the winter.

Alongside all these technical issues, a broader reflection is emerging on the usefulness of caterpillar tunnels. Although less expensive than a greenhouse, they require more work and are less reliable. What's more, a major drawback to their use is that they are not automated. The opening sides must be operated manually, which generates makes work that has to be done on weekends and sunny days.

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Cultivating in a caterpillar tunnel. It can be difficult to stand up on the edge beds. All images courtesy of the author.

Given these facts, it's no exaggeration to ask: Are these really the best structures for our farms? Wouldn't a better investment be to build bigger greenhouses so we don't have to deal with the complexity of adding small, fragile shelters to the farm?

If I were to start a farm today, I would favor building bigger greenhouses. Predictability, efficiency and having real time off are all worth the investment. With all that said, caterpillar tunnels still are an important part of the season extension toolkit. They can expand a farm's protected growing footprint before time or money permit the construction of a larger structure that is sturdier and easier to ventilate. And, in areas with milder winter weather, they may be all growers need to make sure crops survive bouts of bad weather.

This encapsulates our current mindset. Meanwhile, as we navigate through this phase, we remain watchful for any potential high winds, meticulously reinforcing the caterpillar's ropes and steadfastly preparing for the forthcoming delightful spring days.

Catherine Sylvestre is a professional agronomist and leader of the market garden team at la Ferme des Quatre-Temps in Hemmingford, Quebec. She develops, implements, and teaches best practices for cold season growing, specializing in crop protection and greenhouse production for northern climates. She is also the co-author of the book, The Winter Market Gardener, available from growingformarket.com.

Managing gray mold in cut flowers

Lessons from our year of botrytis

By Rebecca Kutzer-Rice

Last year on our farm, Moonshot Farm in East Windsor, New Jersey, we experienced a devastating year for a relatively common cut flower disease, botrytis (aka gray mold). The disease first appeared on ranunculus and freesia in our winter greenhouses, and later a different strain took hold of our lily crop. All told, we lost over $15,000 in product due to botrytis in 2023 and learned a lot of tough lessons along the way.

Botrytis is a fungal disease that eats away at flower petals and leaf tissue, causing telltale spots that make stems unmarketable. Eventually those spots develop a fuzzy gray mold. The most common form we have seen is Botrytis cinera, which can infect many different varieties of flowers. There are also species-specific strains, including Botrytis tulipae, also called "tulip fire," which can devastate tulip crops. Botrytis paeoniae is on peonies, and Botrytis elliptica infects lilies.

In our experience, Botrytis cinera tends to show up as spots on petals late in the growing cycle (i.e., around harvest time) and is relatively easy to eliminate. The species-specific forms tend to cause more devastating issues, like deformed plants and aborted buds, and can be much harder to knock out. Regardless of the botrytis type, they have a lot in common.

Botrytis growing on white ranunculus.

Humidity is the enemy

Botrytis requires high humidity to infect plants. If you are able to effectively manage humidity, keep plants dry, and enable good airflow, botrytis simply won't develop. Humidity control applies mostly to growing in greenhouses and high tunnels. We utilize Govee temperature monitors in all of our greenhouses and have them set to alert us if humidity rises above 85 percent, the danger zone for botrytis.

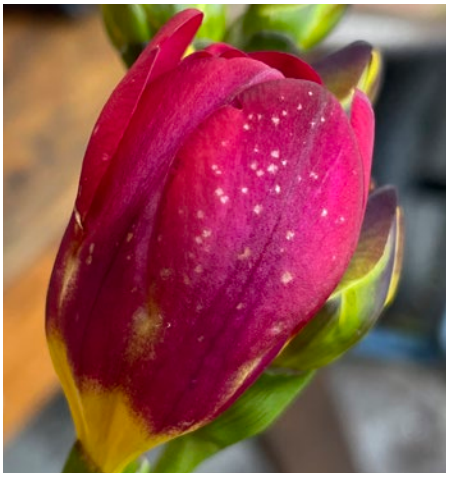
We're able to control humidity through vents and side walls that open and close, plus HAF fans to keep the air moving. During times of overcast, wet weather we will pay special attention to humidity control. We'll sometimes run heaters at dusk with our greenhouse vents open to help draw out moisture. We're also careful to irrigate in the morning and only on sunny days when water will have ample time to evaporate.

In the field, managing humidity is more difficult. Increasing plant spacing can make a big difference in improving how air moves through the crop and help minimize botrytis. We are also prioritizing using greenhouse space for botrytis-prone flowers.

We learned this lesson the hard way in 2023 when we decided to remove the plastic from our lily tunnel. We had hoped that growing lilies in the open air (utilizing shade cloth only), they would have lots of air flow and thrive. We then experienced a long stretch of unusually cold, wet weather in

late spring. The lilies got wet and never dried out again. Botrytis destroyed the entire crop. In the future, we will always grow lilies in a high tunnel under plastic, and we'll work harder to keep humidity low.

In most pest- and disease-related articles, authors advise regular scouting. Catching issues early is key to eliminating them. Unfortunately, botrytis can be so aggressive that scouting is less helpful. We have seen it take hold overnight. One day a crop will look beautiful and then 12 or so hours later, every flower in a greenhouse will be trash. Instead, we have taken the approach that botrytis is inevitable in humid conditions.



(Left) Botrytis on a lily bud. All photos courtesy of the author. (Right) Botrytis spots on freesia, which did not appear until after several hours in the cooler.

Hygiene

Botrytis infests and rapidly reproduces on decaying plant matter, so hygiene is critical. We now strip leaves into crates to keep dead plant matter away from growing crops. We regularly sweep out aisles. If we find any actively growing mold spores, we carefully throw them away. Once a crop is done blooming, we try to flip beds quickly and remove any spent crates of growing medium.

We also now sanitize our greenhouses and high tunnels several times a season using a product like Zerotol. This hydrogen peroxide-based product can be applied to the walls and floors of the greenhouse, as well as to the soil and even to plants. We find spraying it can make a dramatic difference in Botrytis pressure as it kills the spores.

During times of high pressure, we have even misted it onto blooming plants and it has worked to prevent botrytis. Zerotol can cause some damage on sunny days to blossoms, so be sure to do a test patch. If we are applying biofungicides (more on that below), we will wait a day after spraying Zerotol as it can render them ineffective.

Post-harvest botrytis

More scary news about botrytis: sometimes it appears after flowers have been harvested. We experienced this phenomenon for the first time on our freesia crop last year. Freesia is a very slow growing flower and can take six or more months from planting until bloom. A lot can go wrong in that time, and we were thrilled when we finally started harvesting flowers that appeared perfect.

We cut several thousand stems and did our normal post-harvest freesia routine: bunched in 10s, wrapped bunches in paper, and popped them into our cooler for several hours. When we took them out of the cooler, the freesia was covered in botrytis spots. We have since seen this post-harvest botrytis appear in other flower varieties, including lilies and chrysanthemums. The culprit? Botrytis has already colonized on the flowers, and the high humidity of the cooler makes it much worse.

During times of high disease pressure, we now test flowers for 12 hours in the cooler before putting whole buckets of blooms in. If botrytis develops on the test stems, we'll avoid using the cooler

for the remainder of the flowers. Flowers can instead be stored somewhere cool, dry and dark, like an air conditioned room or closet, where botrytis will develop less rapidly. We have saved entire crops of flowers by avoiding the cooler.

We have also noticed post-harvest botrytis can develop inside humid boxes when shipping flowers. Testing stems and choosing less susceptible varieties seems to be key in preventing this.

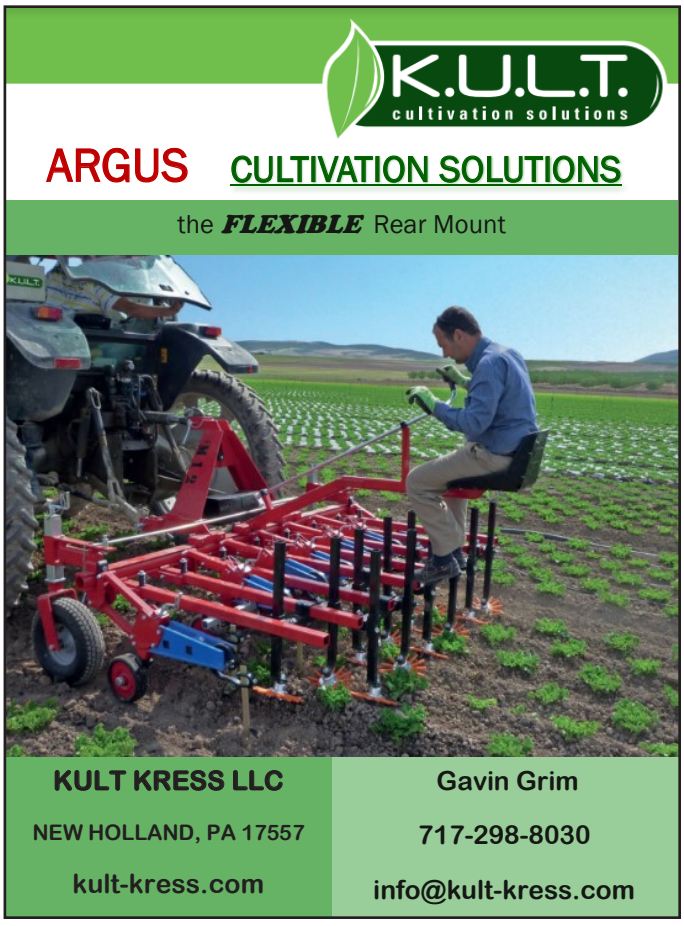
Finally, we have learned only to put dry flowers into the cooler. On wet, rainy days, we let flowers dry off in front of box fans for several hours before putting them into the cooler. We also run a box fan in our cooler to help keep air flowing and reduce humidity slightly. High humidity in the cooler is important for flower quality, but even a reduction from 90 percent to 85 percent seems to reduce botrytis.

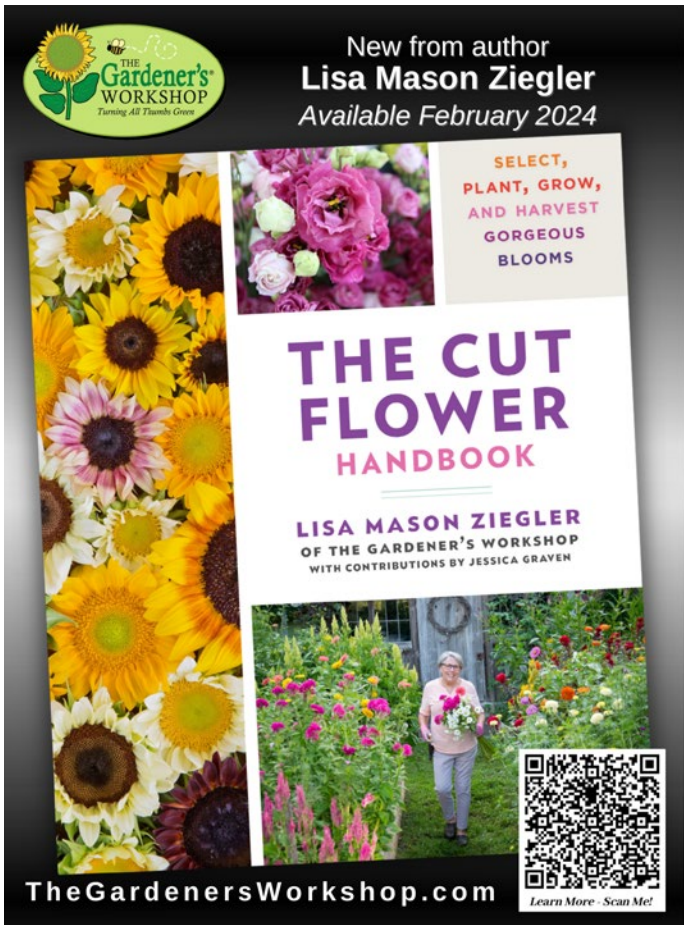
Varieties and colors matter

We find there is a huge difference in botrytis susceptibility depending on species, variety, and color of flower. Any flowers with thin, delicate, or waxy petals seem susceptible. For us this has included lilies, lisianthus, chrysanthemums, ranunculus, anemones, tulips, and freesia. But within these species, some varieties and colors perform differently than others.

White ranunculus seem far more likely to show botrytis than colored varieties — so much so that we have essentially stopped growing white ranunculus. Freesia are the opposite. Colored freesia varieties seem to show botrytis much worse,

We have found white freesia to be less susceptible to botrytis than colored varieties.





so now we grow only white freesia.

Choosing double-flowering varieties has also helped. Because botrytis tends to show up on the outside of flowers (where condensation develops), the external petals on double flowers can be peeled off during times of high disease pressure. During our terrible lily botrytis outbreak, we were able to salvage our double-flowered roselilies by removing the outermost petals.

Certain lisianthus varieties seem to be less prone to botrytis than others. We have had success with the Voyage and Celeb series, which have sturdy petals that hold up to botrytis pressure. The plant breeder Evanthia is now focusing on breeding botrytis-resistant varieties, and we are trialing some of these varieties, like LisAdora, this year.

Botrytis is a major issue across the global floriculture industry, so hopefully breeders will continue to focus on developing resistant varieties.

Chemical and biological controls

Our farm is not certified organic, but we generally choose biofungicides and organic-allowed solutions. Botrytis is resistant to many systemic chemical pesticides, so this organic approach may make sense even for conventional growers.

We have had some success in managing Botrytis cinera using a biofungicide called BotryStop. Sprayed regularly and early in the crop growing cycle, it will inoculate plants and out-compete the botrytis. Unfortunately, we have not found it to be effective against species-specific strains of botrytis like the form attacking our lilies. Actinovate is another biofungicide that we are finding may be helpful against the lily-specific strain.

Perhaps the most promising botrytis control is surprisingly simple: Calcium. This discovery was first made by the landscaping and nursery industry when a few studies showed calcium greatly improved botrytis severity in bedding plants like petunias. After reading these studies, we started applying foliar calcium on a weekly basis to all of our plants grown under cover.

Calcium increases the strength of plant tissues, making them less susceptible to botrytis. We have found it to be extremely effective and think it will be the backbone of our control going forward. Calcium also seems effective at preventing powdery mildew and strengthens the stems of plants.

Several species of lisianthus seem less susceptible to botrytis, like the Celeb series.

Some newer studies have even suggested that calcium can be applied as a post-harvest spray or dip on flowers to prevent botrytis from developing in the cooler. We will definitely be testing that this year on our lilies and freesia.

After losing so much of our spring lily crop to botrytis, the year ended on a better note. Before planting fall lilies, we cleaned up the farm, threw all diseased plant matter into the garbage (not our on-farm compost). We sanitized our greenhouse thoroughly and added more HAF fans.

We spaced our lily crates apart for better airflow and were religious about only watering in the morning, never wetting foliage. We also sprayed the plants weekly with calcium and Actinovate. The year ended in a much better place: a gorgeous crop of thousands of botrytis-free lily blooms, right in time for the holidays. Although this disease is scary, I hope these simple tips help you keep it under control.

Rebecca Kutzer-Rice owns Moonshot Farm, a specialty cut flower farm in East Windsor, NJ. She grows flowers year-round including in a geothermal greenhouse, for retail markets in and around NYC.

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Getting a handle on glove selections for winter work

#toolsforgrowingformarket

By Josh Volk

Scrolling back through all of the photos tagged #toolsforgrowingformarket on Instagram I found a post of some long gauntlet gloves hanging in a packing shed that was posted by Kat Johnson when she was manager of @fieldsedgefarm back in 2020 (I also wrote up Kat's pocket magnet knife holder in this column a few years ago).

As I spent most of the day yesterday washing mud off of veggies in an open shed, taking extra care not to get water into my gloves, this was yet another reminder to me that I need to order a couple pairs of these gloves for me and my crew. That's been something on my long to-do list for probably a dozen years, ever since a farmer at an annual farmer-to-farmer event talked about picking up a pair of these waterproof gloves with sleeves attached at a commercial fishing supply store and how much it improved his quality of life while washing winter veggies.

The gloves in the photo appear to be Showa Atlas 690's, which is a cotton lined PVC dipped glove with a textured palm. I've used the shorter version of these, the 660's, for many years. The 660's are kind of like a heavy-duty dish washing glove. They are available at my local hardware store for about $10 in lots of sizes, and while they don't offer great dexterity I can size them up to fit a liner glove inside and then use them in the field to basically keep my hands completely dry and warm when temperatures are in the 40's and it's soggy out (which is a lot of the winter here in the PNW). Sizing for maximum dexterity is always a tradeoff with sizing for warmth as tight gloves definitely restrict circulation enough to make hands colder.

L to R Showa 377 and Atlas 370 are my field work gloves, typically also sized up to fit with glove liners in the winter.

For tasks where I need better dexterity I use the thinner Showa Atlas 730 which is a much thinner version that's all nitrile and a little less expensive. These have the same length gauntlet, but the material is more flexible, so they tend to bunch up around my wrists which eventually lets water in, soaking my glove liners. Part of why these gloves are thinner is the nitrile, and the other part is that they don't have a cotton lining. This makes it possible to clean them inside and out, something that's not really possible with the lined 660's.

There's also a nitrile version of the long gauntlet 690, the 772, which is lined so likely a little heavier, and an in-between length 747. I prefer nitrile over PVC in general because it's less toxic to produce and more wear and puncture resistant than PVC. I've worked on farms that used neoprene paddling gloves for winter work and while they work well to keep hands warm even when soaking wet I find them more much more expensive and difficult to clean thoroughly during the work day.

My two other main gloves on the farm in the winter are Showa 377's, which are fully dipped for water proofness, but have a knit cuff and a foam dipped palm.

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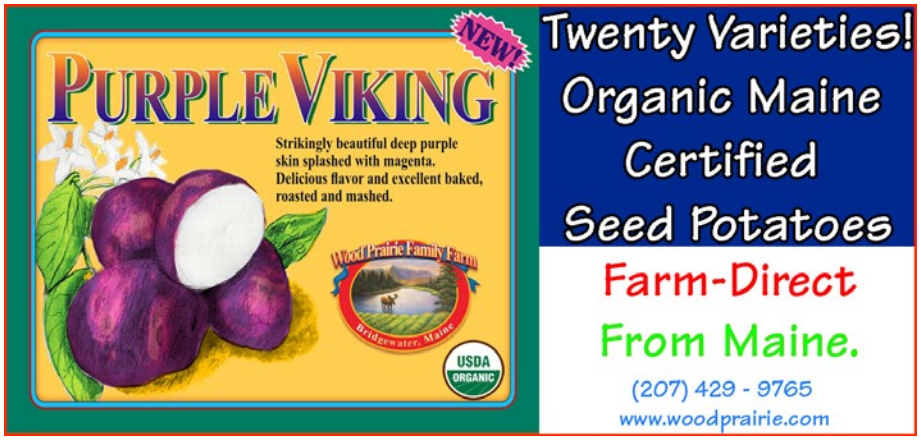

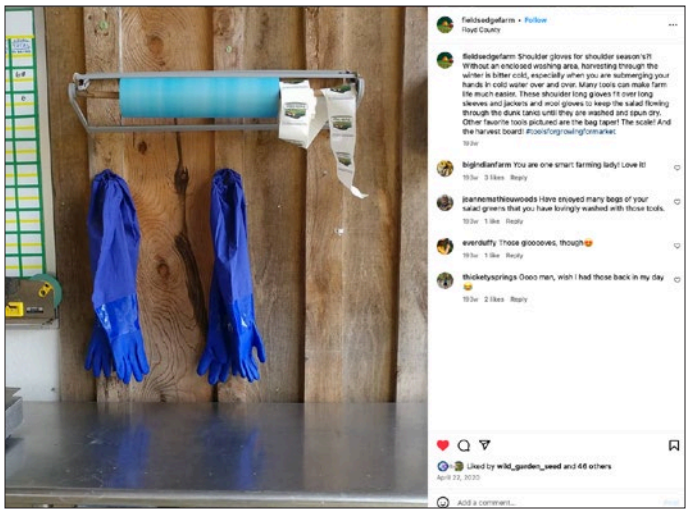

(Left) L to R Atlas 660, Showa 630 and synthetic glove liners are my winter harvest and wash-and-pack gloves of choice when it's cold out. (Right) Above the elbow length wash gloves shown in an Instagram post from Fields Edge Farm by Kat Johnson. Gloves like this have an elastic band at the opening that keeps them from slipping down.

The foam dip gives a little extra insulation and grip, but less dexterity and it's basically impossible to get completely clean if you're trying to keep them clean for harvest or washing and packing so I reserve these gloves for other field work.

When I need higher dexterity in the field and it's not actually raining or excessively wet (which is rare here) I wear the same gloves I wear in the summer– Atlas 370 – which have a thin nitrile dipped palm that's surprisingly durable and gives great dexterity for a glove and stretches to fit over my liner gloves.

This may all sound like an advertisement for Showa gloves and I have no preference for their gloves other than they've been available, reasonably priced and have worked well for me. I'd love to hear what gloves are working well for other folks out there for winter harvests and field work.

On my farm we also have boxes of both nitrile and vinyl examination glove which are essentially single use gloves. When worn over liner gloves these give the best dexterity for things like cutting salad greens. We don't do a lot of that type of harvest, and I dislike the waste, but they're a good option when the dexterity is really needed but it's just too cold to go bare handed. We keep them around in case of cuts to hands as well – which allows someone with a band aid to continue harvesting without worry of contaminating the harvest.

With all of the gloves we use for harvest our crew washes them just like they wash their hands. Gloves are washed before they go out to harvest – soap and water with a good scrub, while they're wearing the gloves – and any time during the day when hands would normally be washed such as when coming back from a break.

One other note on gloves, there's a super simple to make glove drying rack in my book "Build Your Own Farm Tools." How to best hang gloves to dry was always a problem at farms I worked on but if you have fence wire or an old wire hoop you can bend it into a series of long fingers and then drill angled holes into a low beam or piece of wood to mount. Gloves slip over the fingers with the wrist openings hanging down at an angle for drainage and to hold the gloves open. Works great and only takes a few minutes to make once you collect the materials and tools.

Josh Volk farms in Portland, Oregon, and does consulting and education under the name Slow Hand Farm. He is the author of the books Compact Farms: 15 Proven Plans for Market Farms on 5 Acres or Less, and Build Your Own Farm Tools, Equipment & Systems for the Small-Scale Farm & Market Garden, both available from Growing for Market. He can be found at SlowHandFarm.com.

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Cash flow budgeting for farmers

By Julia Shanks

Just before you picked up this issue of Growing for Market, you likely were at your desk or computer planning out the growing season: What you will plant and where, and what supplies you'll need to prepare for the growing season. Maybe you just charged a bunch of purchases to your credit card or scheduled payments from your bank.

You may have a big picture plan that works: Your projected revenue for the year will exceed expected expenses, as well as loan repayments and capital improvements. You'll show a profit for the year. Great! But the challenge for many market gardeners is that the expenses (and cash payments) are front-loaded in the first half of the year, and the revenues (and cash inflows) don't start to peak until the second half of the year.

In April, your bank balance may dwindle down to a precarious level while your credit card balances ramp up. Sure, it will all work out by the end of the year — if you can get there. You need to be able to sustain operations by paying your employees and vendors on time. It can be overwhelming.

Certainly, there are ways to mitigate the cash flow stress (from season extension to selling CSA shares). That said, the best way to ease the stress is to create a cash flow budget that lays out a clear plan to stay "cash positive" throughout the year — that is, to always have a positive balance in your bank account.

A cash flow budget maps when you expect the cash to come into your business and when you expect it to leave. It helps you predict when cash will be tight so you can create a plan to manage it. If you're planning a big purchase (maybe you want to build another greenhouse) a cash flow budget can help you time purchases, loans, and loan repayments so that you don't jeopardize your financial position.

A well-thought-out budget clarifies that you can make it through the year without getting into trouble.

The cash flow budget also gives you a benchmark to help you stay on track. Let's say you build into your plan a target of $1,500 in sales at each farmers market. At the end of each market, you can look at your sales to see if you achieved that goal. If not, you can strategically adjust on the spot — whether its hustling sales to make up the difference, cutting back on expenses because your sales fell short, or focusing on your production because you didn't harvest as much as you needed.

In other words, a cash flow budget gives you the tools to stay on track, avoid a cash crisis, farm with intention, and alleviate stress. And, you can create a plan in a few hours.

Before you get started, consider your goals. Do you have a profit goal (say, $50,000)? Do you have a production goal (for example, expand to grow on another acre)? Knowing where you want to be at the end of the year is the best way to create a plan to get there.

As you think about the coming year and your goals, it can help to review last year's sales and expenses. How much did you sell of what products and to which customers? How much did it cost to produce all those flowers and vegetables? How much labor did you have? What would you do differently, and what would you keep the same?

Also think about how much of a cash buffer you want to have at any given time? Is $1,000 in the bank enough of a cushion? Maybe you need $10,000. You don't want your bank balances to get too close to zero. Your actual cash flows will be off one way or another: A payment from a customer may be a few days late. You may need to make a purchase a few weeks earlier than planned. You want a buffer to absorb the unexpected shifts.

Steps to create a cash flow budget

I usually recommend creating a cash flow budget in two phases. In the first phase, plan out the year, big picture. That is, what's your plan for revenue for the year? How much do you want to budget for production expenses, selling costs, labor, and overhead? You want to make sure that your annual plan gets you to your desired goal.

Once you have an annual budget, you can move onto the second phase and break it down into a monthly cash flow budget. As you know, the cash doesn't flow evenly into and out of your business; it happens in waves. You'll want to make sure you can get through the traditionally lean times (April – June).

PHASE ONE: PLAN THE YEAR

1) Forecast sales

There are two ways to create a sales forecast: start with your revenue goals (top-down) or start with specific production goals (bottom-up).

Top-down sales projections

For a farm that has been in business for a while, it can be more efficient to start with a revenue goal. One way to set a revenue goal is to calculate

your breakeven sales. I detail that process in "The magic of breakeven and how it can help set sales goals" in the February 2020 GFM. The other option is to set a target growth rate, for example, you want to grow 11 percent from $90,000 to $100,000.

From the big picture number, you can break it down further — how much sales do you anticipate earning from the different revenue streams, for instance, attending farmers markets or selling wholesale? If you decide, for example, that 75 percent of your revenue will come from farmers markets and 25 percent from wholesale, then you need to earn $75,000 from the farmers markets and $25,000 from wholesale.

Knowing how much you'll sell in each sales channel (or customer group) can help you think through monthly cash flow as well as production plans. CSA prepayments usually come in the first half of the year before you have any crops. Farmers market sales happen later in the year, and you usually get the payments right away (either cash or credit card direct deposits). Wholesale customers often pay several weeks after delivery.

Bottom-up sales projections

If you don't have a lot of experience setting sales goals, especially in the first few years of a farm business, it can be easier to start from the bottom up.

- How many wholesale customers do you want? How much do you expect them to order each week? How long is your season?
- How many CSA subscribers do you think you can grow produce for?
- How many acres do you want to plant? How much can you produce in each bed or row? And how much revenue can you earn from each crop.

For example, if you think you can grow enough produce for 40 CSA members and your price will be $700 per share, then your estimated revenue from the CSA would be $28,000.

2) Estimate expenses

Take a look at 2023's profit and loss statement, and specifically at your expenses. Consider which expenses are associated with production and sales and which are general overhead (we'll talk about labor expenses in a minute). Specifically, if you increase sales, which expenses will also increase? In academic terms, these are your variable expenses- see figure 1 for an example of how this might look.

Your production costs can be seeds, greenhouse supplies, field supplies, and labor. For the purposes of cash flow planning, you can expect that as revenue and production increases, you will spend more on these line items. You will also have more credit card processing fees and packaging. If you're using QuickBooks, you can run a profit and loss statement for last year, and add a column to look at expenses as a percentage of revenue.

For each line item, take the percentage from last year and multiply it by this year's sales projection. For example, if your seed/seedling expenses were 3 percent of revenue last year; then it's reasonable to expect they will also be 3 percent of revenue for the coming year. If you project sales of $100,000 for this year, then you can budget for $3,000 in seed/seedling expense for the year.

I know it might feel tedious, but I encourage you to go through each line item in your profit and loss statement. This ensures that you don't forget anything.

One of your biggest expenses will be payroll, so you want to make sure you think this through. If you set a budget for $30,000, how many workers can you have? Is that enough to support your sales goals? Will you pay payroll taxes and workers' comp insurance?

A sample schedule provides a framework for estimating labor expenses.

- List out the different positions you need filled: harvesters, CSA managers, farmers market crew, drivers, etc. You don't need to know who's going to be working when,

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just that someone will be working.
• Set the hourly wage for each position.
• How many people do you need working each shift, each day?
• How many hours will they work in a day? How many days per week? And for what weeks throughout the year.

Once you determine the number of shifts worked per week, the duration of each shift and the hourly pay, you can then calculate an estimated weekly payroll expense. You may need to adjust the schedule for different phases of the growing and selling season.

In addition to the wages paid to your employees, you will also pay federal and state taxes, social security, and workers' comp insurance on behalf of your employees. This can vary from 9 percent to 12 percent in additional expenses. For simplicity's sake when creating a budget, add 11 percent to the salaries for payroll withholdings and insurance. For actual day-to-day operations, I encourage you to seek a payroll service provider to ensure that you are properly withholding payroll taxes and submitting them to the appropriate agencies.

Finally, outline your non-production expenses (like liability insurance, vehicle registration, etc); you can budget more generally. You know how much your liability insurance will be. You can project these expenses based on what you spent last year. If you know an expense will go up, then you can factor that in, too.

Sample Income Statement
Friendly Fields Farm

	January 1- December 31, 2023	% of Income
Revenue		
CSA	13,500	8.2%
Farmers' Markets	139,000	84.9%
Wholesale	7,700	4.7%
Seedling Sale	3,600	2.2%
Total Revenue	**163,800**	**100.0%**
Expenses		
Direct Operating Expenses		
Booth Fees	2,500	1.5%
Equipment	3,300	2.0%
Fertilizer and Lime	1,600	1.0%
Mulch	5,700	3.5%
Pest Control	1,500	0.9%
Seeds and Plants	4,200	2.6%
Soil Tests	500	0.3%
Supplies	8,200	5.0%
Total Direct Operating	**27,500**	**16.8%**
Payroll		
Labor Hire	55,000	33.6%
Taxes: Payroll	6,500	4.0%
Worker's Comp + Disability	2,000	1.2%
Total Payroll	**63,500**	**38.8%**
General and Administrative		
Accounting Services	800	0.5%
Advertising	1,200	0.7%
Bank/CC Fees	1,650	1.0%
Insurance Liability	1,200	0.7%
Continuing Education	200	0.1%
Meals and entertainment	150	0.1%
Office supply	800	0.5%
Permits and licenses	250	0.2%
Professional fees	500	0.3%
Subscriptions	250	0.2%
Work Clothes	300	0.2%
Total General and Administrative	**7,300**	**4.5%**
Repairs and Maintenance		
Car and Truck	4,300	2.6%
Gasoline	6,600	4.0%
Repairs and Maintenance	800	0.5%
Tools	1,300	0.8%
Total Repairs and Maintenance	**13,000**	**7.9%**
Occupany		
Rent	3,300	2.0%
Utilities	5,500	3.4%
Total Occupany	8,800	5.4%
Total Operating Expenses	**101,100**	**61.7%**
Operating Income	**62,700**	**38.3%**
Depreciation	16,200	9.9%
Taxes	2,500	1.5%
Net Income	**44,000**	**26.9%**

Figure 1. All images courtesy of the author.

3) Detail other cash flows

So far, we've been focused on the core of your business. But you'll likely have other cash flows. If you have a loan, then you'll have regular payments. If you're trying to pay down your credit cards, you'll want to set a goal for that, too. If you plan to purchase equipment or make significant improvements to infrastructure, then list those out, too. If you expect to get a grant, write that down.

One more thing — and this is really important — write down what you want to pay yourself. If you haven't already included a salary for yourself above, then note it here. What do you need to support yourself? You need to cover your basic living expenses as well as pay your personal debt. Ideally, you'll also include a savings goal (retirement) and factor in that you'll want to do things besides work (hello, vacation!), and you'll need some funds for that.

4) Look at the year as a whole

At this point, you should have an annual total for sales, expenses, and other cash flows. Take your total sales number (and grants), and then subtract your expenses and other cash outflows. Do you have a positive number? In other words, is your projected revenue and cash inflows enough to cover your expenses, loan repayments, and personal expenses?

If revenue isn't enough at this point, then you'll need to refine your numbers to make it work. You have a few options:

- Consider if you need to increase your revenue goals. Can you practically get there production-wise?
- Can you reduce your operating expenses? Look at each line item and consider where you can reasonably make it work with a tighter budget.
- Do you need to take a loan to cover your desired investments/purchases for growing the business?

For deeper analysis, you may want to look at your pricing strategies and cost of production. Are you pricing your products high enough so that you can cover your costs? If you don't know your cost of production, then this will be difficult to answer. Josh Volk wrote a great article on "Know your cost to grow" in the November 2023 GFM.

You'll need to find a scenario where you have enough revenue and cash inflows to cover your expenses and other cash outflows. If you can't make it work on paper here and now, then the chances of you making it work in real time is slim to none.

PHASE TWO: CREATE A MONTHLY BUDGET

Now that you have an annual budget, we can break it down into a monthly cash flow plan. In what months do you expect the cash flow?

5) Assuming that you created your annual budget in Excel or Google Sheets, add 12 columns to the right of your annual budget, one for each month. Then map out, by month, when you expect to the cash to flow.

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For example, if you projected that you'd earn $75,000 from farmers market sales, when do you think that will happen? If the markets don't start until June, then start laying out the farmers market revenue for June on. If you expect that all your production purchases will happen in February and March, then put all of those budget expenses in those months. See figure 2 for an example of how this might work.

6) At the bottom of each month, you can total the expected income and other cash inflows and the expected expenses and cash outflows. Your net cash flow will be inflows minus outflows. It's okay if you have some months with a negative cash flow (for example, expenses exceed revenue). It's expected in a seasonal business. The trick is to make sure you have enough cash in the bank to float those months.

7) Note how much cash you have at the beginning of the year. This is your beginning cash balance. At the bottom of the January column, take your beginning cash balance and add (or subtract) the net cash flow for the month. This is your ending cash balance for the month. Does it remain positive with a cash balance greater than what you want your buffer to be? Great! If not, then you'll need to consider if you need to borrow cash or adjust the timing of your purchases.

8) For February, your beginning cash balance is the ending cash balance for January. Add (or subtract) the net cash flow for February. This is your projected ending cash balance for February. Does it remain positive? Great! If not, then you'll need to consider if you need to borrow cash or adjust the timing of your purchases.

9) Continue on in this way through the rest of the year; confirm each month that your plan keeps you cash positive with enough of a buffer. Make adjustments as necessary.

Now what?

You've created a plan that you know can work, and you have a road map to help you stay on track. Each month, you'll want to compare this budget to what actually happens.

Did you achieve your CSA sales goals in March? Did you sell what you expected at the seedling sale in May or the farmers market in July? If not, do you know why? How can you make up the difference? If you miss the mark on your sales goals, then what other adjustments do you need to make? Do you need to cut back on expenses, or increase production? Do you need to find additional customers and markets?

Also, look at your expenses on a monthly basis to make sure you stick to the budget. Did you overspend in certain areas? What adjustments do you need to make to get back on track? If your costs increased and you hadn't planned for it, then maybe you need to raise prices. If you overspent, then maybe you need to rein it in in other areas.

In summary

This focused approach helps anticipate cash fluctuations, allowing you to strategize for lean periods and always maintain a positive cash balance. Regular monitoring of actual performance against the budget enables you to adjust and adapt quickly, whether by tweaking sales approaches, managing expenses, or revising production plans. Ultimately, this proactive budgeting approach empowers you to navigate cash flow challenges, farm intentionally, and mitigate financial stress while working towards your goals.

If you need more support, I invite you to visit my website thefarmersoffice.com. I have a video tutorial that walks through this process step-by-step.

Julia Shanks is the author of The Farmer's Office, Second Edition and The Farmers Market Cookbook, available from growingformarket.com. She works with farming and food entrepreneurs to help them achieve financial sustainability through business planning, cash flow planning and financial feasibility studies. She is a Certified QuickBooks Pro Advisor. You can learn more about her work and watch videos on how to create a cash flow budget at thefarmersoffice.com.

Sample Annual Budget
Friendly Fields Farm

		MONTHLY BREAKDOWN											
	Annual Total	January	February	March	April	May	June	July	August	September	October	November	December
Revenue													
CSA	20,000	5,000	5,000	4,000	3,000	3,000							
Farmers' Markets	181,000					5,000	25,000	47,000	47,000	25,000	20,000	12,000	
Wholesale	9,000						1,000	2,000	1,500	2,500	2,000		
Seedling Sale	6,000					6,000							
Total Revenue	**216,000**	**5,000**	**5,000**	**4,000**	**3,000**	**14,000**	**26,000**	**49,000**	**48,500**	**27,500**	**22,000**	**12,000**	**-**
Expenses													
Direct Operating Expenses													
Booth Fees	2,700					300	600	600	600	300	300		
Equipment	3,700		1,000	1,800	900								
Fertilizer and Lime	2,200			1,200	1,000								
Mulch	6,400		-	2,000	2,500	900						1,000	
Pest Control	1,900						900	1,000					
Seeds and Plants	3,700		-	1,000	1,300	1,400							
Soil Tests	500			500									
Supplies	9,100				2,500	2,800	3,000	800					
Total Direct Operating	30,200	-	1,000	6,500	8,200	5,400	4,500	2,400	600	300	300	1,000	-
Payroll													
Labor Hire	58,000	1,000	1,000	3,000	6,000	6,000	8,000	8,000	8,000	7,000	6,000	3,000	1,000
Taxes: Payroll	6,960	120	120	360	720	720	960	960	960	840	720	360	120
Worker's Comp + Disability	2,200	40	40	120	240	240	280	280	280	280	240	120	40
Total Payroll	67,160	1,160	1,160	3,480	6,960	6,960	9,240	9,240	9,240	8,120	6,960	3,480	1,160
General and Administrative													
Accounting Services	400				400								
Advertising	1,000				200	200	200	200	200				
Bank/CC Fees	6,480	150	150	120	90	420	780	1,470	1,455	825	660	360	-
Insurance Liability	900			450							450		
Continuing Education	200	100	100										
Meals and entertainment	200		-	50							50	50	50
Office supply	1,000	200			200		200			200		200	
Permits and licenses	100	100											
Professional fees	600			300	300								
Subscriptions	100											100	
Work Clothes	300						150	150					
Total General and Administrative	11,280	550	250	920	1,190	620	1,330	1,820	1,655	1,025	1,160	710	50
Repairs and Maintenance													
Car and Truck	3,700		200		500			500	1,700		300	500	
Gasoline	7,800	50	150	300	350	450	1,000	1,500	1,500	1,500	600	300	100
Repairs and Maintenance	1,000		600									400	
Tools	1,500					600			300	600			
Total Repairs and Maintenance	14,000	50	950	300	850	1,050	1,000	2,000	3,500	2,100	900	1,200	100
Occupany													
Rent	3,600	300	300	300	300	300	300	300	300	300	300	300	300
Utilities	3,400	100	150	250	300	300	500	500	500	200	200	200	200
Total Occupany	7,000	400	450	550	600	600	800	800	800	500	500	500	500
Total Expenses	**129,640**	**2,160**	**3,810**	**11,750**	**17,800**	**14,630**	**16,870**	**16,260**	**15,795**	**12,045**	**9,820**	**6,890**	**1,810**
Net Operating Cash Flow	**86,360**	**2,840**	**1,190**	**(7,750)**	**(14,800)**	**(630)**	**9,130**	**32,740**	**32,705**	**15,455**	**12,180**	**5,110**	**(1,810)**
Other Cash Inflows													
Grant	10,000			10,000									
Operating Line of Credit	20,000		-		10,000	10,000							
Total Other Cash Inflows	30,000	-	-	10,000	10,000	10,000	-	-	-	-	-	-	-
Other Cash Outflows													
Taxes	6,000				3,000					3,000			
Equipment Purchase	21,000		5,000	5,000		7,000							4,000
Mortgage and Other Loan Repayment	40,500	1,500	1,500	1,500	1,500	1,500	1,500	7,500	12,000	7,500	1,500	1,500	1,500
Owner Draw	30,000	1,000	1,000	1,000	1,000	2,000	3,000	3,000	3,000	3,000	3,000	4,000	5,000
Total Other Cash Outflows	97,500	2,500	7,500	7,500	5,500	10,500	4,500	10,500	15,000	13,500	4,500	5,500	10,500
Net Cash Flow	**18,860**	**340**	**(6,310)**	**(5,250)**	**(10,300)**	**(1,130)**	**4,630**	**22,240**	**17,705**	**1,955**	**7,680**	**(390)**	**(12,310**
Beginning Cash		25,000	25,340	19,030	13,780	3,480	2,350	6,980	29,220	46,925	48,880	56,560	56,170
Ending Cash		25,340	19,030	13,780	3,480	2,350	6,980	29,220	46,925	48,880	56,560	56,170	43,860

Figure 2

Ten questions to ask yourself before joining a farmers market

By Leah Smith

The farmers market is a likely destination for many new farmers and gardeners who are ready to try selling their vegetables and flowers. And it is a logical one — relationships need to be formed, experience needs to be gathered, lessons need to be learned, and reputations need to be forged as you begin to establish your operation. And a farmers market is an excellent place for this.

Wholesale contracts, restaurant and grocery store connections, CSA shares, these all tend to come later with a few seasons under your belt. Plus, direct-to-consumer sales are famously where the best money is to be found.

Although it is a sales option with few barriers, in order to be successful you (and your farm) need to be prepared. You need modest but crucial infrastructure in place. And you need to be ready to pay attention to the market(s) as well.

Here are a few questions to think about before you head to market. The first few focus on market selection, the next handful on market operations, and the final three deal with farm marketing feedback and its impact on your farming.

1. Will the market be a good fit?

You might think choosing a farmers market to attend is a simple matter of going to the nearest. But not all markets are created equally. If this is to be your operation's main source of income, it may be worth it to go farther afield for a better fit. Some fundamental questions are whether the market offers more than one day for attendance and if you can take advantage of this. Do you have the time? Will you have the product? What time is the market?

Fresh-cut flowers, strawberries, leafy greens, and other sensitive produce items better retain their tempting appearance if you take them to the crisp air of an early morning market that is over at noon rather than forcing them to withstand the heat of an August afternoon sun. Flowers, greens, and, yes, berries, wilt, and bagged items of all sorts get steamy. How many of these will be part of your offerings?

2. Is the market in a good location?

A farmers market can't just work well for you, it has to work for the customers, too. If a market you are considering has long been established, the logistics side probably runs smoothly or it wouldn't have lasted so long. In this case your challenge is carving out a presence in an established market.

The author's market sign. Signage is very important- if customers don't know what something is and what it costs, they won't buy it

However, if you are looking into a new market that has not yet stood the test of time, it might not be so well positioned. For example, how well publicized is the market? Does it do a good job of advertising? Does everyone know its hours? Have they been changing days or hours in recent years? That's a sign they are looking for something that works because what they are currently doing is not working. This this will inevitably lead to customers confusion.

What is the location like? Is it along a busy road or on a back street? Will it pick up incidental traffic or will people have to go with purpose? Quite importantly, does it have parking space? You might be surprised at how quickly potential customers will become alienated when there is no place to park. It is also worth noting if a particular market is set up so those on food assistance programs like SNAP Bridge Cards, Double Up Food Bucks, WIC Project Fresh, and Senior Project Fresh can use them at that location.

3. What demands will this market place on me?

It can be important to fit in at a market. To put it another way, for their and your ideas of what a market should be to mesh. This includes the very practical, such as the booth rental cost and if the market requires insurance. It also includes the structure of the market. Does it require posted prices, allow wholesalers, or carefully keep an eye on the composition of the market?

In other words, how is competition managed at this market, hands off or hands on? And what about entertainment and social aspects? I have been at markets where all you do is set up and sell to customers (with a little vendor chatting in the down times), and also ones with weekly musical performances, monthly raffles, and the not infrequent need for donations of product for special occasions. Each market had its positives and negatives. Which sounds like your kind of market?

4. Have I sized up the competition?

Though it is not a guarantee that the composition of a market one year will mimic its appearance the next, they are frequently quite similar with many regular market vendors. Therefore it is a good idea (if you can manage it) to visit the market(s) you are considering to see what is being offered.

The more hands-on market managers pay attention to what is being offered, being more inclined to accept new vendors with different products and thereby try to avoid gluts on the market. They want variety for the sake of the customers and also so each vendor has a better chance of selling what they bring, which is achieved by everyone not bringing the same things. Is everything you grow already being offered? Do you think you should specialize with a few items that are in short supply at the market?

You can also regard your potential customer pool as a challenge, in a sense — they have money and you are putting forth an effort to get it from them! Do they look

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like they will be a good pool for you? What kind of people want to buy what you sell, the older or the younger, the occasional shopper or the regular shopper, the fad follower or the steady home cooker? Who do you see shopping, and will they be receptive to your product, especially in terms of your specific advertising plan?

5. Am I accessorized?

You may be surprised at all of the accoutrement required to set up a market booth (perhaps not all required, some is merely advisable for a successful booth). You will need some manner of tables, chairs, tablecloths, price signage, product signs, farm name signage, baskets, buckets, display tubs, crates. Possibly a pop-up canopy tent for markets without structures. And coolers or crates and boxes for transporting items. And shopping bags, maybe business cards. And, for the portioning of some items, a scale or quart and pint boxes. And maybe plastic bags and twist ties for more perishable or delicate items. And then there is keeping produce cool on warmer days. Ice water, ice cubes, misting bottles, these are all ways to keep produce feeling fresher.

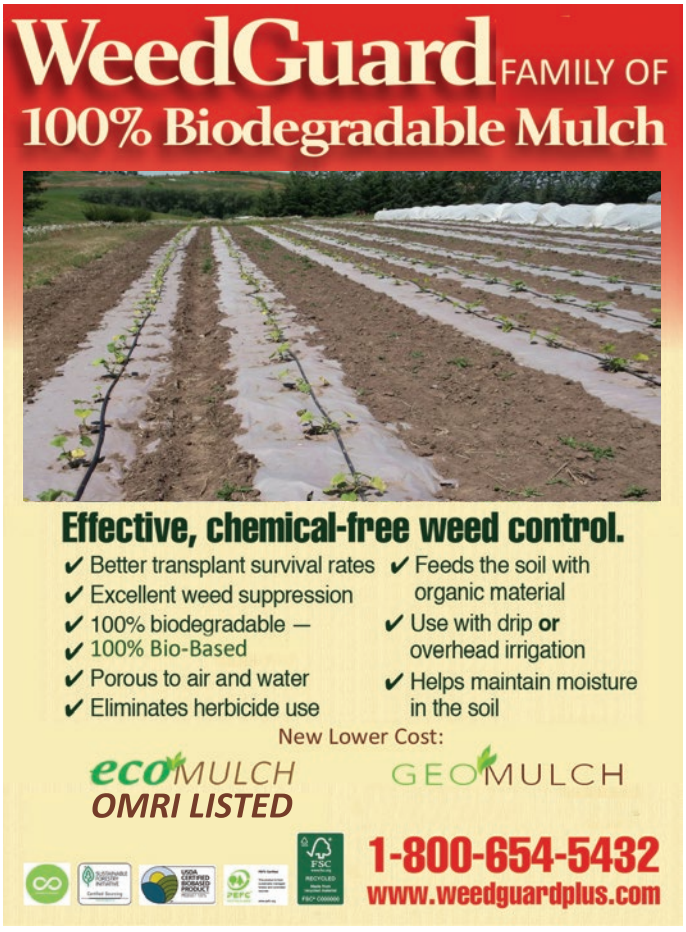
And then, the business side, are you ready for that? In the old days when I started going to market, you had your money apron and had to make sure you brought change along. Maybe you were a Doing Business As (DBA) to accept checks written to your farm name — not necessary if you filed to become an LLC.

Some people still deal in cash, but many customers want to use their credit cards. You can accept payments on your mobile device by signing up for an account with a payment processor that offers mobile credit card processing, downloading an app, and purchasing a mobile card reader. The most popular brands are Square, PayPal, and SumUp. Will you sign up for one or stick to cash-and-carry business?

6. Am I ready to advertise my booth?

A well-advertised market is very good, but not good enough. If the market gets customers there, it is your job to then get them to your booth. You must be ready to let customers know what makes you and your products special. Are you Certified Organic or Naturally Grown (or something else)? Are you hyper-specialized in one product, or do you offer variety? Do you like to offer the basics (tomatoes, potatoes, corn, etc.) or specialty items (microgreens, mushrooms, mulberries)?

Once you decide how to present what you do in the best terms, get ready with everything from signs, leaflets, and farm albums to electronic newsletters, websites, and a Facebook page, or whatever combination of these methods you wish. An important word on advertising is to stick to what you will do long-term, rather than promising to make facebook posts or send out newsletters or maintain



an interactive website and fail to do so. It is better to keep it simple and stick to it rather than to attempt to become more elaborate than you are able to maintain and let people down with poor advertising follow-through.

7. Am I ready with displays and communication?

For good customer interactions, the first thing you have to do is get them into your booth. Appearance is important at the farmers' market. In addition to good quality, clean produce, an attractive display is important. Whether you go for smart and professional or cosy with character, tablecloths, baskets and tubs, and prices clearly displayed will make your table more approachable. A sign highlighting your produce can help people decide to stop in. It never hurts to have attention grabbers as part of your display — a mass of quart boxes lined up together and full of potatoes, tomatoes, broccoli, etc., or baskets tipped on their sides with produce spilling out (tipped on their sides for better visibility).

Remember that people always respond well to full displays — as your half bushel empties out, switch to a peck, then a half peck, always keeping that full appearance. Play around with individual produce to see if a different display method will help.

We had a co-vendor who kept garlic in a basket at the end of his table, and it never sold well. One day he forgot the basket and simply had a nice pile next to his other items, and it never sold better. And our elongated peppers

Clean, colorful containers can help highlight their contents.

attracted a lot more attention and achieved greater sales when we boxed them blossom end up ("pointing up"). Items like fresh-cut and dried flowers, fruits, and value-added products (from honey or pollen to jars of jam to baked goods) will often entice people into your booth, the important first step.

You have to go to the market ready to talk. It is true that at a busy time on busy days you probably won't have to say much. But for days when you have to work harder (or you have a chatty customer), you want to be knowledgeable about your offerings. From variety names to prep and cooking advice to farming practices, be ready to share. We frequently offered printed recipes to encourage sales for produce we had in abundance, or that was unusual and required explanation.

Preparing your sales pitch is especially important if you have some unapparent value to convey—if your focus is heirlooms, nutrient-dense foods, organic production, pollinator-friendly methods, humane animal treatment, etc., you will need to be ready with the what and why.

8. Can I sustain an entire market season?

Many markets favor applicants who can attend for greater portions of the season — favored with preferential acceptance and also preferred spots at the market. Also, the greater the frequency of your presence at a market for the season, the quicker and more securely you will acquire regular customers.

Many people have warm-season crops in mind when they first begin market farming — tomatoes, cucumbers, summer squash, bush beans, melons, sweet corn, etc. To have the product ready for both the early- and late-days of the season you must do more. Lettuce, asparagus, rhubarb, spinach (and other greens), scallions, peas, radishes,

salad turnips to start the season, and winter squash, globe onions, garlic, fall brassicas, storage potatoes to finish.

You could also build structures for season extension to extend the main summer favorites to the days preceding and succeeding their typical harvest window. Alternatively, you could add some "season-less" products like eggs, honey, pollen, maple syrup, or mushrooms (all of which have some seasonality to them, really, but their supply tends to be fairly constant) to fill out the season.

9. Am I ready to be flexible?

To be successful at a farmers market, it is often helpful to be observant and opportunistic. What are customers looking for? What are vendors selling? Are there too many zucchini or slicing cucumbers at this market? Should you look into patty pans and Armenian cucumbers next year? Should you add a fruit or two? Is anyone having success with unique varieties of any kind of produce, or more so with the familiar varieties? Is it green or red lettuce, green or red cabbage, or green or yellow bush beans, for example, that will sell?

Should you grow some different hot peppers? Would they sell better in a smaller (or larger) quantity? Some of this is observation for the seasons to come, but some can apply to your current season. For example, can you harvest your summer squash or kale leaves or beets at a smaller size to make them unique items that will sell better? So basically: what are people (including you) trying to sell and what are they actually selling? What are customers looking for and what are they buying? Can you alter your harvesting this year or try new varieties next year or make value-added products to create success? Or do you simply need to change unit size? Or presentation?

10. Do I want to go to a market?

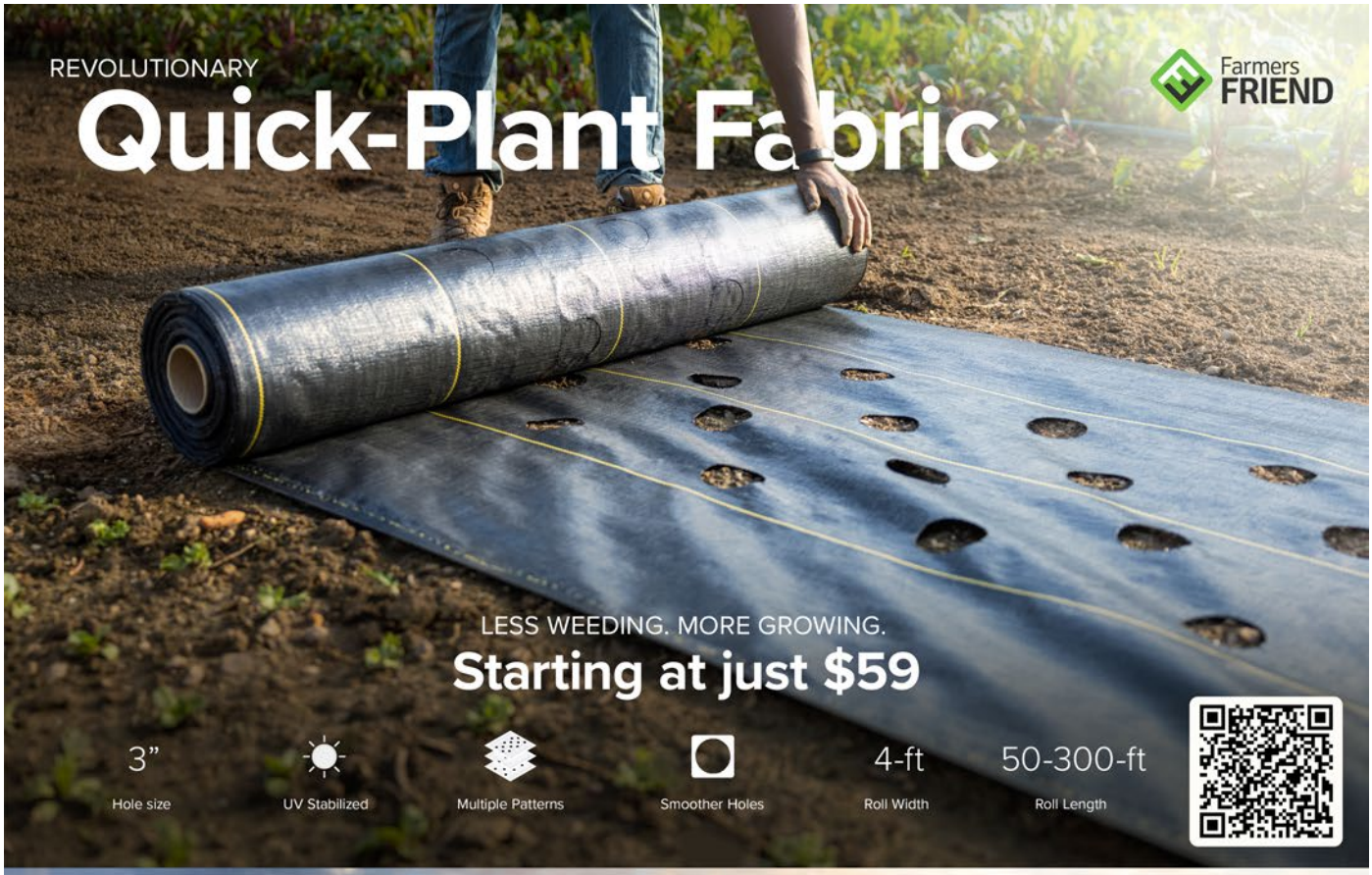
Maybe a strange question, but this is important to ask at the end of each season. Everything changes. Demands on your time change. Your agricultural interests may shift a bit. Perhaps you have formed new relationships with local chefs or grocery stores. Maybe what you are growing and producing has shifted and is better suited to a different sales venue. Or you have gained enough experience and built a reputation to allow you do to CSA shares.

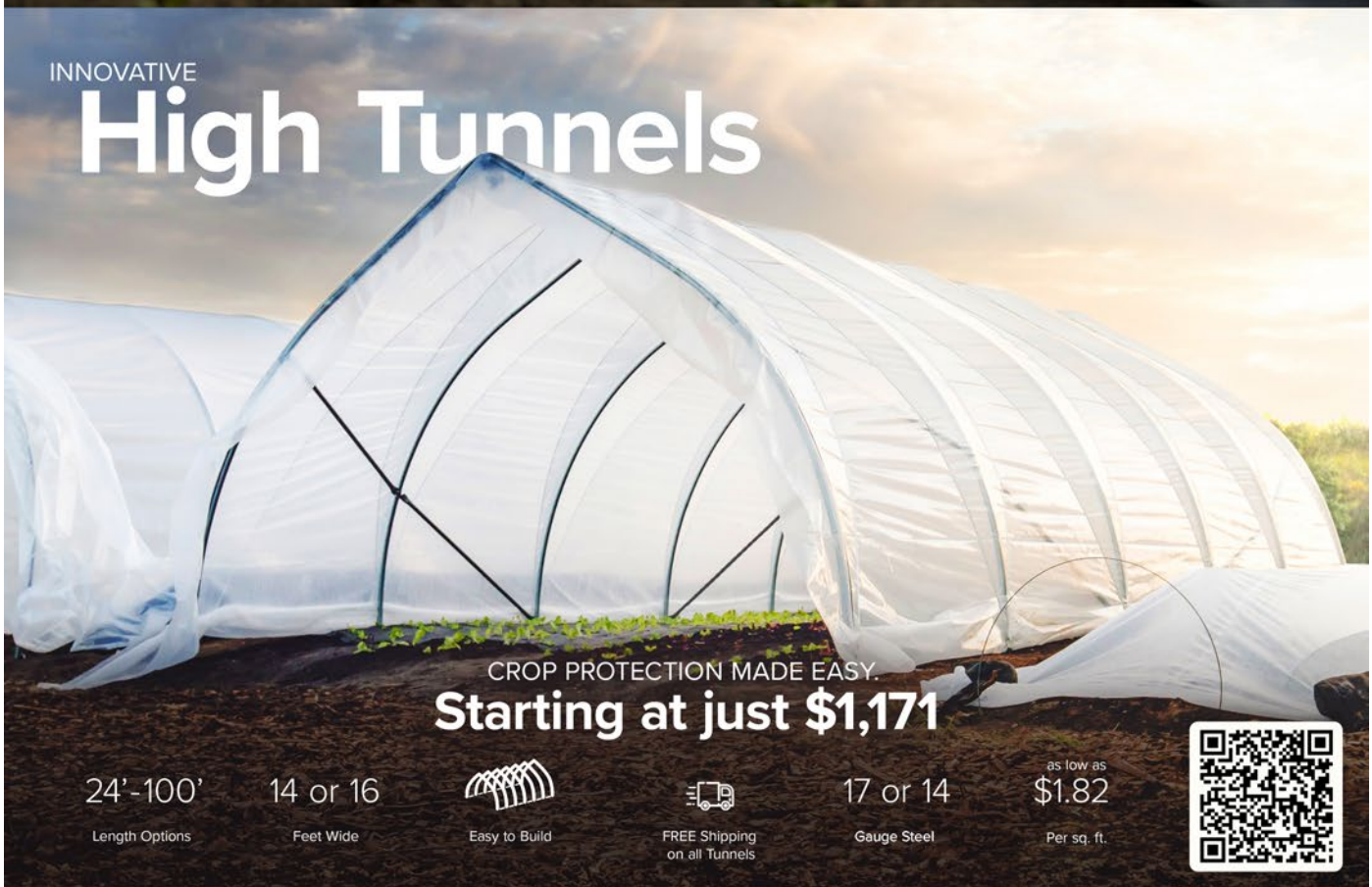
Abundance is always enticing. Pile it high and watch it fly!

Or instead of a weekly market you could attend pop-up markets, or only a few harvest festivals. There is no denying that production, preparation, and attendance at farmers markets takes a great deal of time compared with most other sales options. And if the weather is not very hospitable on any given day, customer attendance may not be very good.

But farmers market selling can also be one of the most rewarding activities in terms of money earned and relationships made. It likely is at least a part of your farm sales plan, as long as you have just that — a plan.

Leah Smith is a freelance writer and home and market gardener. She works on her family's farm in mid-Michigan called Nodding Thistle (certified organic 1984 to 2009, principally by Organic Growers of Michigan). A graduate of Michigan State University, she can be reached at noddingthistle@gmail.com.





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Accessing underserved customers

Fundraising, partnering and sliding scales to reach them

By Janna Siller

As farmers, our customer base is limited to the number of people within our sales range who can afford what we grow. To increase our customer base, we are used to thinking about tempting more people to put what we grow at the top of their weekly grocery list, or figuring out how to expand the geographic sales boundaries toward larger population centers. Here, we'll think through increasing sales by reaching customers with minimal food budgets. (See the related article "Serving the underserved" in the August 2018 GFM.)

In my region of northwest Connecticut only about 62 percent of households are in a financial position to purchase vegetables at the prices I need to charge (see Figure 1). Households experiencing poverty comprise 12 percent of the population and ALICE households (a United Way term that refers to those who earn just above the federal poverty level but less than what it costs to make ends meet) comprise 26 percent. These numbers track fairly closely to national averages (unitedforalice.org).

At Adamah Farm, where I manage three acres of organic vegetables for direct market sales, we've gotten creative with how to expand our customer base into the 38 percent of households in our community that would struggle to afford our produce. We recoup the equivalent of our full wholesale pricing on everything we grow for distribution to that demographic thanks to a combination of foundation grants, individual donations, and sliding-scale pricing.

Adamah produce on the way to the food pantry.

We have so much on our plates as farmers (pun intended). It feels a bit unfair to write an article that suggests farmers add the task of addressing income inequality in our marketing plans. For me though, fundraising isn't any more cumbersome than other types of marketing. I'd much rather write a grant application in the winter than negotiate and track restaurant accounts in the summer. I'll share a little about our process below, as well as additional opportunities beyond the scope of our particular farm to give you a sense of the options.

Adamah Food Access Fund

In 2020, a time when food insecurity skyrocketed due to the pandemic and was front of mind for many of us, we launched our Adamah Food Access Fund. Every year since then, we fundraise to fill that fund with enough money (most years about $12,000 which is 15 percent of our gross sales) to pay ourselves the value of everything that goes out to our local food access partners. We track the weight and wholesale value of those distributions to balance the quantities against what we've brought into the fund.

We have long had relationships with local food pantries (small charitable organizations that distribute groceries to community members in need) and senior centers, having donated our excess for years. We would bring crates of slightly bolted bok choi, post-CSA pickup produce left behind by members who were on vacation or eat-these-today-or-they'll-sauce-themselves super ripe August tomatoes with nowhere else to go.

It is common for market growers to find ourselves in these relationships with hunger relief organizations. We hate to see gorgeous food wasted and we want customers who can't afford our prices to have access to our food. Pantries are a great resource for distributing donated excess to people who appreciate it, but our Food Access Fund has now allowed us to develop the relationships much further. We are now able to bring higher quantities, better quality, and more culturally appropriate foods.

We plan for the weekly distributions to food access partners in our field plan and in our weekly harvest list, but they remain much more flexible than other sales avenues — a huge advantage. We still bring extra produce that has nowhere to go for one reason or another, but we are also able to consistently bring the items our partner organizations tell us clients are looking for.

A good example is cilantro. One of the food pantries we work with serves a high percentage of people who've immigrated from Mexico. Their clients use cilantro less as an herb for seasoning, the way I usually think of for our CSA, and more like a salad or cooking green as the flavor and nutritional basis of dishes. Most of the pantry's clients have little to no access to cilantro as it is expensive, low quality, and inconsistently available at grocery stores.

Understanding this situation motivates me to stay on top of biweekly cilantro plantings so we can bring plenty of large bunches as a focal point of our deliveries to the pantry. I don't find it any harder to grow than other greens, and we are recouping the same value for those bunches as we would if we were selling them to a restaurant or other wholesale account.

Something went wrong with one of our cilantro plantings this summer, and it was a total flop (rain at the wrong time, hasty planting without watering properly, you know how it goes). Rather than losing a customer, as we might with a finicky wholesale account, we simply delivered parsley for a couple of weeks rather than cilantro. We were bummed to be a little off of our field plan, but the relationship with our pantry clients is more like the relationship between CSA farm and shareholder. Imperfection is part of the process and a little variation in output is forgiven as long as the overall product is consistent and high quality.

When I compare our food pantry and senior center accounts to our other sales avenues, they are consistently more efficient for us. The volume, flexibility, and ease of delivery make the wholesale prices work for us. If

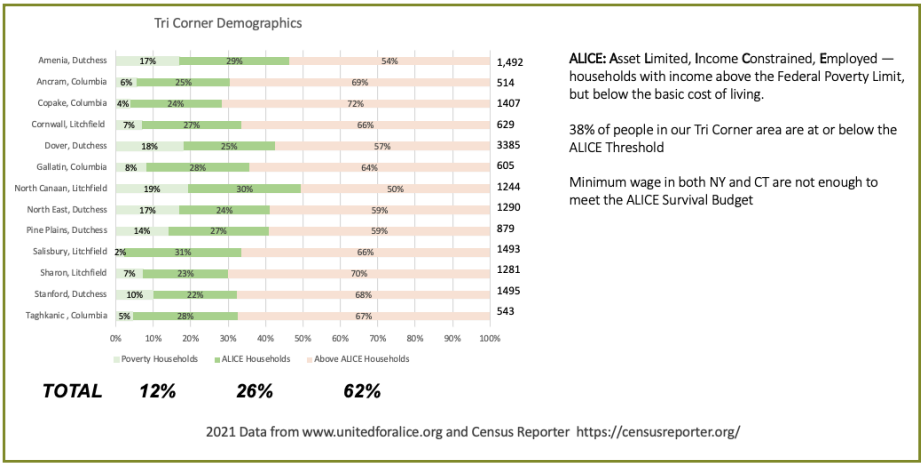

Figure 1- Data on Adamah Farm's Regional Demograhics from United for Alice, Compiiled by Tricorner FEED.

Nutrition Insecurity

While many Americans experience food insecurity and hunger, many more have access to enough calories, thanks to the availability of cheap processed foods and hunger relief efforts, but don't have access to good nutrition. For all the reasons we are familiar with as market farmers, (lack of subsidies, cost of production, challenges of marketing perishable items) accessing the necessary nutrition from fresh produce is particularly cost prohibitive to many.

we were to sell our produce at a significant markup at a farmers market, we would have to sink hours of labor into packing, driving, and staffing the stand.

If we were anywhere other than the top markets, which there aren't many of in our area, we would have a good percentage of shrink that would go unsold at the end of the day (especially if the weather kept market customers low). We'd have to grow some of everything to make the display full and gorgeous, rather than the items we know pantry clients are particularly looking for.

CSA and some farm-to-institution accounts are still lucrative centerpieces of our business, as they offer their own advantages and I haven't been able to fundraise enough to sell everything we grow wholesale to food access partners. Still our subsidized "sales" are an important part of our business rather than an afterthought.

In addition to the Food Access Fund, sliding-scale CSA pricing has expanded our customer base, especially into that ALICE demographic of households described above. In our CSA marketing, we list the cost of production for a twenty-two week share at $830, asking that members reflect on their financial capacity and pay what they can, including a higher rate if budget allows.

Explaining a sliding scale can be tricky — most of us aren't used to reflecting on our assets and savings and expendable income in relation to that of others when whipping out our credit cards. But CSAs are unique economic models already, and I've found that people are willing to take the time to read through our explanation and be thoughtful in determining their payment amount. Members are generous and honest, and they seem to very much want to support the farm, so we consistently bring in an average of at least $830 per share, putting any excess into the Food Access Fund. In years where we come up short, we cover anyone who can't afford the full CSA price with money from the fund.

Of course, sliding scale CSAs, or similar structures at pay-what-you-can farm stands, have their limitations. They only reach people with the ability to come to the point of sale, and you have to be operating among a pool of customers that includes those with enough financial means to contribute at higher rates. The realities of wealth disparity are such that people of differing financial capacity might not live in the same area as one another, and a farm might need to include multiple sites in different

places if they are trying to reach different financial demographics.

Raising funds for food access

When I explain the Food Access Fund to potential funders they are often particularly interested in the double impact of addressing nutrition insecurity while supporting local farm viability.

It takes leg work to figure out where to apply. Some foundations may only give to non-profits, so an LLC or other farm business entity without 501c3 status would need a fiscal sponsor to accept those grants. Other foundations will give grants directly to any business entity as long as the project meets their eligibility requirements.

You can start with a simple google search for community foundations in your region or go the analog route and ask around. Find nonprofits in your area doing good work and ask where they get their funding. Foundations have specific areas of focus, so look for ones working on health or strengthening local economies. Most have program managers whose job it is to talk to potential recipients about whether a grant might be possible.

It's worth taking time with those conversations so you don't waste effort on an application that won't go anywhere. We never receive every grant I apply for, but the more I've gone through the process, the more I've developed a narrative I can repeat without reinventing each application.

Food pantries themselves are also a great resource for finding funding. Most are operated by a community organization like a church, mosque, synagogue, health center, or other small nonprofit. They fund their budgets via public and private grants as well as financial donations from individuals.

Pantries usually purchase food, almost exclusively nonperishable items, at low cost from food banks, a term that usually refers to organizations like Feeding America that aggregate food donated by, or cheaply purchased from, the industrial food system. If pantries are able to offer any fresh produce or animal protein, they are usually purchasing it separately and not through their food bank orders.

Pantry operators in my region often travel half an hour away to purchase produce at retail prices from discount grocery chains. Considering this reality, it is worth figuring out what your price point would be for selling bulk to pantries. Then, determine whether the pantry's budget, perhaps with extra support from donors, might accommodate direct purchasing from your farm. Soup kitchens (charitable nonprofits that prepare meals rather than distribute groceries) and other community projects may also be in a similar position to purchase directly from you rather than their regular sources.

At Adamah, we also fundraise

Northwest Connecticut Food Hub Director Renee Giroux moving a pallet of regionally grown produce dropped off by farmers, agregated, and prepared for outgoing delivery to food access organizations.

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from individuals in our community with a button on our website and occasional email appeals. We have CSA members who regularly make holiday gifts of donations to the Food Access Fund, and others who are generous throughout the season when we send out an email campaign.

Local farmer support organizations can also be good funding sources for food access work. Four farmer support organizations in our region — CTNOFA, Berkshire Grown, Berkshire Agricultural Ventures, and Tri Corner FEED — offer grants to farmers to subsidize food grown for nutrition insecure households.

If your region doesn't have community foundations, individual donors, or farmer support nonprofits that are already funding food access work, don't despair. Most of the organizations described in this article were not offering food access funding five years ago, so there may be a slow and steady process afoot by simply putting feelers out, asking questions, and remaining open to the possibility that opportunities might present themselves over time.

Partnerships with nonprofits

Farmers tend to be a self-sufficient bunch, but wealth disparity doesn't exist in a vacuum and so the solutions don't either. Here are a few examples of organizations that are partnering with one another, with farmers, and with government agencies to address food access issues. These might inspire you to think about what's possible in your

Renee Giroux and Susan Zappulla-Peters with pallets of produce aggregated from different regional farms and prepared for deliveries to local food access organizations.

(Left) Adam Dropping off fresh lettuce and cilantro at Friendly Hands Food Pantry in Torrington. (Right) Adamah apprentices and volunteers harvesting cucumbers for food pantry delivery.

region.

The Food Sovereignty Fund: The Glynwood Center for Regional Food and Farming, a nonprofit in New York's Hudson Valley, raises money to match farmers with food access partners and pays them for the deliveries. The Food Sovereignty Fund distributes $300,000 among 23 farms and is overseen by Glynwood staff along with an accountability council made up of farmers, community organization operators, and other experts.

Megan Larmer, who works with the fund for Glynwood, had some advice for farmers looking to get involved in similar projects: "It is important to make a good match between the capacities and needs of the farm and the partner organization. If there is a food pantry serving groceries to 800 families a week, we match it with a higher volume farm. If there is a soup kitchen looking for a few ingredients for 100 weekly lunches, we can match it with a very small farm."

"The charitable food system, or emergency food system, or however you want to name it — food pantries, mutual aid networks — they are all spending money on food. There is this expectation that they're getting their food for free but that's not the case, so it's worth going to them directly and asking how to partner. The cost of buying wholesale from farms is rarely significantly higher than retail from grocery stores. Reliable partners are hard for pantries to find. If you can be counted upon, that is super valuable so don't undersell your farm.

"I'd recommend having a formal planning meeting between the farm and the food access organization to establish pricing, delivery locations, timing, contact info, record-keeping expectations, seasonal availability, and what to do in the case of a crop failure or a pantry closure. Relationship building is key, it is the mycelial network that is the basis of partnerships working in the long term."

The Northwest Connecticut Food Hub: Renee Giroux, who runs the nonprofit NWCT Food Hub, describes it as a place that lifts the region's farms together by expanding access to customers rather than putting them in competition with one another. The hub is a physical distribution center where farms drop off orders to be aggregated and then delivered to customers including restaurants and other wholesale accounts. It also delivers subsidized orders to food access organizations like food pantries, hospitals, and schools. The 30 or so participating farms list their availability each week online for buyers before the delivery deadline.

Food Hub board member, Jocelyn Ayer, explains that the goals of supporting farms while improving food security in the region are funded

through a hodgepodge of sources. "The farm to school funding comes through a contract the school districts have with an education focused non-profit; the funding for food as medicine distributions to diabetes patients at the hospital comes through a healthcare community fund; food pantry subsidies come through the USDA.

"It's all much more complicated than anyone wants it to be, but dedicated volunteers cobble together the grants, along with staff at partner organizations like the hospital. It would be too hard for individual farmers to access these types of grants, so that's the purpose of the hub. We can funnel grant money into the food system and do the quick turnaround needed for applications and reporting."

Tri Corner FEED and the Northeast Community Center (NECC): A nonprofit started by retired farmers who understand the particular challenges of farming and the need for farmers to charge fair prices, Tri Corner FEED's mission is to promote food equity. Founder Linda Quella describes it as "the ability of people to get high-quality, nutrient-dense food whenever they need it." The organization makes grants to farmers who produce for food access organizations.

It is launching a study to evaluate the feasibility of a fair pricing program where people pay for locally produced food based on their financial capacity. The study is being done in partnership with NECC, a local community center, and with the financial support of a USDA Local Food Promotion Planning Grant.

NECC's food program director, Jordan Schmidt, this winter is deep into the process of surveying farmers and consumers and reviewing other food equity solutions that are already up and running. The main thing she's learned so far about fair pricing program models is that context really matters. One model might include preloading a regional EBT-style card for consumers to use at farm stands and markets, such as is used in the ADK Action program in the very rural Adirondack mountains of New York.

Adamah fellows and apprentices preparing to harvest for a food pantry delivery.

In other cases, having an aggregator component, like the NWCT Food Hub described above, might be more important. In still other cases, having a grocery retail storefront is most appropriate, as with the Hudson, New York, based Rolling Grocer 19.

So far the Tri Corner FEED/NECC study has found that most farmers are excited about the potential of a fair pricing program. They are open to accepting wholesale prices, but not lower and would need systems to be smooth and easy to use in order to participate. On the consumer side, Schmidt is finding — from study results and her own experience running a food pantry at NECC — that consumer choice is really important.

Outside of the survey itself, NECC gathers local farmers, chefs, and staff members of food access organizations on a monthly call called the Tri Corner Nutrition Security Coalition. The coalition has thus far been a useful forum among people working toward solutions from different angles, and will only be more so if and when a fair pricing program gets off the ground here.

Federal, state, and local funding

Advocates have long seen the resilience-building opportunities in connecting local farmers with an expansive range of customers, including those experiencing financial insecurity, through government programs. Be-

low is an attempted overview of the kinds of options that exist. The details of each vary considerably by location, so if you want to know more about what is available to you, your best bet is to ask for advice from local agencies (USDA, state departments of agriculture, local health and human services offices, municipalities).

Farmers who have navigated government grants, incentives, or technical assistance — perhaps via NRCS for a high tunnel or conservation incentive or via FSA for COVID relief — know the process can be confusing and that not every opportunity is a match for every farm. When they are the right fit, however, government programs can also be worth the effort, so it is worth knowing what's out there.

Much gratitude to Hannah Quigley of the National Sustainable Agriculture Coalition, Brent Ling of Wholesome Wave, and Ben Feldman of the Farmers Market Coalition for helping me understand the programs listed below well enough to describe them to you.

SNAP: The Supplemental Nutrition Assistance Program allows income-eligible Americans to purchase food with monthly benefits loaded onto EBT cards that are issued to each recipient. There is an app currently under development that would allow farmers to accept SNAP without an EBT reader, but for now you, or the market you sell at, will need to have one. If your farm doesn't already accept SNAP benefits, you can contact your local extension office to get connected to a SNAP educator who can set you, or the market you sell at, up with FNS (USDA's Food and Nutrition Service) as a SNAP vendor.

FMNP: The Farmers Market Nutrition Program offers additional farm-fresh food purchasing benefits to recipients of WIC (the Women Infants and Children supplemental nutrition program) and to income-eligible seniors. Your local health and human services agency can help set you, or the market you sell at, up with the ability to accept these benefits.

Doubled Nutrition Benefits: There are a myriad of public and private efforts to increase the spending capacity of SNAP and WIC recipients who buy fresh food directly from farmers, including the popular Double Up Food Bucks program. If you or the market you sell at don't already partner with one of these efforts, consider asking local health agencies about how to get tapped in.

LFPA: The Local Food Purchase Assistance Program uses federal money to buy food directly from farmers, often at close to retail prices, for distribution to food access distributors. LFPA is usually administered through state departments of agriculture, education, or health, so those are the agencies to inquire with if you are interested in learning more about the program.

GUSNIP: There are two programs within the Gus Schumacher Nutrition Incentives Program, both of which are aimed at connecting the food system and the health care system toward improved resiliency for both. The GUSNIP Produce Prescription Program treats fresh produce as a kind of medicine, awarding grants to healthcare organizations that can then prescribe subsidized

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The GUSNIP Nutrition Incentive Program awards grants to farmers markets, community health organizations, and the like for point of sale incentives for consumers. The GUSNIP Nutrition Incentive Hub is a resource that can help with that application process. For either grant, you could work with an eligible nonprofit or government agency that wants to apply and develop a plan they could rely on to buy from you with the award.

Farm to School: Is there anything more satisfying than watching a child eat a vegetable you grew? School food procurement is a complicated matrix, but there are resources to help schools buy directly from farms. Many states and municipalities have their own programs, and there is federal money as well. So, it could be worth asking your school district about the options or encouraging them to apply for funding.

Regional Food Business Centers: Many of us are accustomed to working with cooperative extensions to support our agronomic and horticultural practices. USDA has newly launched regional food business centers to support local food systems and marketing with technical assistance and capacity building grants for things like food safety, processing, and packaging. While their focus is to support farmers in navigating the supply chain in general, the centers could be a good resource for the specific question of how to connect to the food access opportunities described above in your area.

Janna Siller is the Farm Director at Adamah, an organic production farm and educational program in Falls Village, CT. She also represents the nonprofit organization, Hazon, as a member of the National Sustainable Agriculture Coalition.