



Eleven things we did to make our farm profitable (finally)

By Rebecca Kutzer-Rice

Like most small businesses, our farm took several years to make a profit. After starting farming as a side hobby in 2019, we gradually grew our business until I quit my job at the end of 2022 to farm full-time alongside my husband (see my article “Making the leap to farming full-time from the September 2023 GFM, and my interview on the GFM Podcast, for more on that). With this huge change the pressure was on. If we were going to keep on farming, the business finally needed to become profitable. I’m excited to share that we pulled it off. Here are 11 things we did that helped us go from profit-less to profitable.

Set a realistic goal

Hop onto any market gardening forum, and you’ll find profitability claims are all over the place. I’ve seen growers brag about 20 percent, 30 percent, even 50 percent of their gross revenue being profit. As a new farmer, those percentages felt huge. As it turns out, they’re probably unrealistic, especially for farmers just starting out. According to the USDA the vast majority of small farms aren’t profitable at all.

Our extension agents at Rutgers University recommended a realistic profitability goal for new farmers in our area to be around 8 percent to 12 percent, which felt a lot more attainable to us. In future years, we hope to go as



Better understanding the labor costs of key crops has helped us price flowers in a way that preserves profit.

high as 20 to 25 percent in terms of profitability, but in 2023 I’m pleased to report that we hit 13 percent — right on target for our goal.

For the purpose of this article and these percentages, I’m using a simple definition of “profit” to mean my income minus my expenses, and for “profit” to include my (and my husband’s) salary.



Squeeze crops / 7



Online farmers markets / 12



Equipment sharing / 27

Hired financial experts

One of the first things I did after quitting my off-farm job was book a meeting with our accountant, who specializes in farms. He was able to provide us with valuable information on how to best set up our business with the goal of profitability. For us this meant converting the farm to an S-Corp and starting to pay ourselves salaries for the first time. Our accountant was also able to advise on key deductions and expenses, such as taking our health insurance premiums as a farm expense.

We also met with a farm-specific bookkeeper to help us adjust our Chart of Accounts in our bookkeeping software and set some specific goals. Finally, we met with our insurance agent. While we previously had basic farm liability insurance, having a detailed, in-person meeting around our insurance coverage helped us to understand what would be protected in the case of an emergency. Going forward, we'll have this insurance review on an annual basis to ensure our assets are properly insured.

Talked to farming experts

In addition to meeting with financial advisors, we also hired farming professionals to advise us on our business. Throughout the year, we worked with Ellen Polishuk (Plant to Profit), who helped us work through all kinds of issues — from improving our fertility through detailed soil analysis to advising on issues like labor difficulties to helping us better mechanize certain aspects of our farm.

It may feel counterintuitive to pay for a farm advisor when so much good information is available for free. But we found one-on-one coaching with a successful farmer paid for itself immediately. We saw increased yields and felt more confident in our management skills.

More recently, we worked with a coach for our specific crop: cut flowers. We hired Michelle Elston from Roots Flower Farm. Michelle helped us work on flower-specific efficiencies like what tools would speed up harvests and how to set up our bouquet-making station for maximum speed. Michelle also helped us dial in our succession planning for specific crops.

I have noticed a lot of farmers advertising coaching services, so definitely do your due diligence on their experience before hiring someone. I had seen both Ellen and Michelle speak before hiring them to coach me and visited Michelle's farm during an annual tour. With many years of experience as profitable farmers, they were trusted advisors with so much to share.

A final farming expert I was connected with was John LaSalle, who became my mentor via the Association of Specialty Cut Flower Growers (ASCFG) mentorship program. For two years, John advised me on issues like pests/disease, winter production, and staff leadership. John grows many acres of dahlias and guided us through scaling up our own production. Having this guidance from a

third generation flower farmer was invaluable.

If you're a flower grower and haven't yet joined the ASCFG, I can't recommend it enough. And if you grow a different crop, seek out your relevant industry organizations to see if they offer a similar mentorship program.

Made our chart of accounts work for us

This one is based on a tip I learned from Julia Shanks (author of *The Farmer's Office*) at a conference several years ago. Like a lot of farmers, our initial chart of accounts in our bookkeeping software was set up following the basic categories on our Schedule F, as was suggested by our accountant. However, these categories are very broad and do not provide a lot of valuable information about our business.

We broke them down into more detailed categories. For example, instead of just "Seeds and Plants," we now have individual accounts for items like Lily Bulbs, Dahlia Tubers, and Plugs. This makes it straightforward to see exactly how much we've spent on these crops throughout the year.

We also broke our Supplies category down into subcategories like Growing Supplies (e.g., irrigation, drip tape) and Post-Harvest Supplies (e.g., Kraft paper, rubber bands).

Another example is the line for "Gasoline, Fuel, and Oil." We now have individual subcategories for Tractor

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Diesel, Delivery Van Gas, and Greenhouse Propane. The result is a detailed Profit & Loss report that helps us understand exactly where we are spending our money and where we could try to spend less.

Checked the numbers every day

During our first few years running a business, tax filing time was a nightmare of late nights combing through old receipts and emails trying to figure out all of our expenses. We never knew exactly what our profit (or lack thereof) would look like until we were done with this task, which usually took several weeks.

Over the last year, I have built a new habit of reconciling our accounts every day. I do it over my morning coffee. By updating our books daily, it never takes more than a couple of minutes each day. Each morning I reconcile our bank statements and categorize our expenses, as well as add any sales that came in for the previous day. This means that, on any given day, I can see a pretty accurate snapshot of how the business is doing.

I'm using Xero for our bookkeeping, rather than Quickbooks, in large part because of its robust mobile app. This allows me to check our numbers every day right from my phone, rather than having to break out the computer.

Preparing documents for our accountant this year took under an hour, thanks to our up-to-date financial records.

Obsessed over cash flow

When we began to rely on our farm as our sole source of income, cash flow became a big deal. Like most farms,

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Some flowers we liked growing but needed rebranding – like daffodils, which started selling better at a more open bloom stage, and rebranded as “heirloom narcissus.”

our sales are all over the place depending on the season, with our biggest sales days in the early spring and late fall. Likewise, our expenses ebb and flow. When our bulb bills are due, the five-figure expenses can be a lot to handle.

Carefully tracking cash flow has eased financial anxiety and better helped us in business planning. I created a simple spreadsheet, with a column for each week of the year. There are rows for categories of money coming in and

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going out of our bank account. The spreadsheet helps us think months ahead to when a large bill is coming due or we expect a windfall from a holiday market and ensure we'll have enough cash on hand to cover ourselves.

It also helps us predict and resolve cash gaps. For example, I noticed we'd need to pay off a large bill covering ranunculus bulbs last fall, but that our CSA wouldn't launch for another week. We adjusted the CSA launch date in order to have plenty of necessary cash.

Also to ease cash flow, I have negotiated better payment terms with some of our suppliers. Our main plug supplier now allows us at least 60 days from shipping until payment is due. One of our fall bulb suppliers has agreed to "Easter Terms," meaning our fall bulb bills are not due until Easter. Negotiating these payment terms has added a lot of flexibility to our ability to manage expenses.

I check our cash flow situation every day when updating our books. It only takes a few minutes, but has ensured we are never in a cash emergency.

Set a budget and stuck to it

After meeting with financial and farming advisors, and getting our books under control, I had a much better idea of where all our money was going. The trick now was to actually keep some of it for myself. Speaking with a lot of farmer friends, it sounds

like many of us (myself included) are not taking a particularly intentional approach to budgeting. We spend money as we need to and as the crops demand, and hope it all works out in the end.

Back when I worked in IT for large companies, we were always allocated an annual budget for our department to spend on staffing, hardware, etc. If we ended up spending too much in one category, we'd have to make up for it by taking money away from somewhere else. Why not try adopting this approach to our farm?

Using the previous year's numbers as a starting point, I set budgets for different categories of our expenses. It was helpful to think in terms of percentages of our gross revenue, rather than fixed numbers. For example, we budgeted 30 percent of our gross revenue to spend on labor and payroll (including payroll taxes). As our revenue projections increased throughout the year, we were then able to bring on additional staff based on our budget.

Having a budget is especially helpful when it comes to purchasing plants and seeds. Like most farmers, I'm a plant lover and it can be easy to overspend when trying out interesting new varieties. But setting realistic budgets has helped me from going overboard while still leaving room for experimentation.

Eliminated sales channels

It was very tempting as a newer farmer to sell to anyone who was buy-



We dropped several sales outlets including florists and focused our efforts on our most successful outlet: farmers markets.

ing. Farmers markets, CSA, florists, local wholesalers, co-ops, pop-up craft fairs, farm stands, cake decorators — we were selling to them all! When I took a closer look at our numbers, however, it was clear that only a few of these outlets were responsible for the vast majority of our sales.

For us, retail was the clear winner, with over 75 percent of sales coming from farmers markets. I was shocked when I looked at our records and saw that we had made only 0.5 percent of our revenue selling to florists. Dealing with florists certainly took up a lot more than 0.5 percent of my time.

We eliminated florist and wholesale sales, stopped doing one-off pop-ups, and even dropped one of our farmers markets that was under performing. By focusing our energy and crop plans on fewer outlets, we were able to maximize sales and efficiency. In turn, our revenue grew despite dropping outlets, as we were better able to tailor our efforts to the outlets we did keep.

Narrowed down our crop plan

Just like trying to sell to everyone, it was tempting to try growing every weird cool cut flower out there. When we first started out, our crop plans


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We narrowed down our crop plan and focused on flowers our customers really love, like dahlias.

were all over the place, our seed orders were out of control, and we weren't growing anything particularly well.

We knew we had to narrow down our crop plan, but how to choose what to keep? We drew a simple Venn diagram. On one side was "Crops our

customers love" and on the other was "Crops we're good at growing." We decided to focus on the crops in the center of the diagram, those that we knew we could sell and that we knew would grow well. For us, this included anemones, lilies, tulips, and chrysanthemums.

We also set a goal to get more crops into this center column. As an example, dahlias were a flower our customers loved but we weren't very good at growing. We spent time researching this crop by speaking with other farmers, implementing mechanization, and improving our pest management. It was worth spending this time learning the crop because we could sell every stem we could grow. By the end of the season, we were better dahlia farmers and our bottom line was better, too.

Inversely, we worked on marketing crops that we liked growing but weren't selling well. Daffodils are a great example. Early on in our flower farming journey, we had planted thousands of fancy daffodils, which

are an easy and reliable perennial flower. As advised in the farming books, we harvested our daffodils in tightly closed bud form for the longest vase life. And we sold very few.

Customers just weren't drawn to the closed flowers, and they thought daffodils sounded too boring. The next year, we tried selling them at our markets at a more open stage, so that customers could see how interesting the varieties were. We also scrapped the word "daffodil," instead rebranding them as "heirloom narcissus." Many customers remarked that they had never heard of this exotic flower, which they bought up by the armful. In 2023, daffodils ended up being one of our highest grossing flowers.

We also realized that a lot of crops did not land on our Venn diagram at all; they were not particularly popular with customers, and we weren't good at growing them. For us, these included many summer annuals like gomphrena and ageratum, as well as gladiolus, which our customers said reminded them of funerals and al-

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ways ended up infested with thrips. We dropped all of these crops.

Improved our records

I have never been a great record keeper, but adding a few simple records into our daily habits have been essential to becoming profitable. First, we started keeping a basic field map with the dates we seeded, the dates we transplanted, and the dates we began harvesting each crop, plus any notes. This has given us a much better understanding of our crop timing and successions.

Next, we began keeping a daily harvest log. Our harvest log is a simple Google Form that everyone on the farm can access. To make completing it easy, the form is prepopulated with what's currently in bloom. I update it every few months to stay current. Whoever puts flower buckets into the cooler is responsible for recording the number of bunches harvested.

The form feeds into a spreadsheet where we can see exactly what was harvested when. This helps us see where our gaps in production are and better understand yields from our flowers. We can also compare it to our sales records to see how well certain crops are selling. Getting everyone to use the log took a few weeks, but it has now become an easy habitual task.

Finally, and perhaps most importantly, we have improved keeping records of labor and time. While my hus-

band and I didn't used to track our own time, we have started clocking in right alongside our crew, an idea we got from Michelle at Roots Flower Farm. This gives us a better idea of how many hours we're actually spending on the farm each week (a lot more than we expected).

We've also been recording how long certain tasks take to better understand our crops' costs. On our Harvest Log form, there is an optional line to add the number of hours spent harvesting. We ask our crew to complete this line a few times during the course of each crop's season, so that we can get a sense of the average hours spent harvesting different crops.

We've also been taking notes around key tasks, such as how long we spent planting dahlias (72 hours last year) or how long it takes us to water the lilies (around 80 minutes when the greenhouse is full). All of this labor data comes together with our enhanced expense categorization to give us a key metric: our costs to grow our most important crops.

Adjusted our prices

In discussions among flower farmers, pricing is a popular topic of conversation. Common advice is to check the USDA's report on Boston Ornamental Terminal prices or make an account with a local floral wholesaler to see what they're charging. The problem with using these prices as a guide is that they're based mostly on imported flowers, often grown at massive scale, using questionable labor practices, and usually with systemic pesticides. All of this is pretty irrelevant to my own farm.

After tracking our labor, expenses, and supplies, I learned that our direct costs to grow a tulip in January are around 78 cents, not including our farm's overhead costs like insurance and depreciation. Meanwhile, tulips at my local wholesaler are currently \$6.50 per 10-stem bunch. If I based my pricing on that, we'd be quickly out of business.

A simple formula that is working well for our retail-focused farm is to multiply our cost to grow by three. This accounts for overhead and loss, while still leaving room to bring home a profit. For retail, we then add sales tax and round up to the nearest number. Of course, pricing as the market will bear is an important part of the equation.

Rather than actually raise prices, we have made our bunches and bouquets slightly smaller. Our tulips last year were \$20 per eight-stem bunch, and this year we've reduced the bunch size to seven stems after determining our costs. No one has complained or even seemed to notice, and our revenue is way up. According to my daily check in, up nearly 40 percent from this time last year.

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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Squeeze crops

A practical approach to intercropping

By Jamie Davis

When we started A Way of Life Farm in 2009, intercropping and companion planting (the practice of growing two or more crops in the same space at the same time) were a part of how we wanted to farm. Yet, after some trial and error, we abandoned it, writing it off as “not practical on a farming scale.” However, we revisited it a few years later as we were looking for ways to maximize space in our new high tunnel. Now, it has become a very important part of how we continue to grow more and more food on the same (or even less) area over the last few years.

“Why even bother?” you might ask. Intercropping helps protect the soil from sun, wind, and rain by increasing the amount of vegetative cover. More plants also mean more photosynthesis which will mean more carbon being pumped into the soil, feeding a greater diversity of soil microbes — especially if we plant different species of plants in the same space.

Aside from these benefits to soil health, we have noticed improved crop growth in certain crops when they are intercropped versus being grown alone. Radishes are one crop that I wish I never have to grow by themselves again. They produce so much better when intercropped, and then when they are finished, I don’t have to worry about what to do with that empty short section of bed while the other crops finish maturing. The main crop simply takes over and uses the whole bed space.

Even without improved crop growth, we find that we are able to increase value per bed-foot. For a

crop like broccoli that might be marginally profitable alone, adding \$2 of value to each foot of a bed by intercropping might make the difference in that bed space being profitable or not.

The challenge is to maximize these benefits without causing problems for any of the crops occupying the space. Poor timing, spacing, or just mismatched crops can end up causing disease, stunting, and decreased harvest efficiency.

On our farm, we approach intercropping using what we call “squeeze crops,” which are generally smaller, faster crops (radishes, baby greens, salad turnips, etc.) paired with larger, longer-season crops that are planted in one or two rows per

bed (tomatoes, broccoli, or cabbage, for example).

We plant one row of squeeze crop between two rows of main crop, or two rows on either side of a main crop that is planted in one row per bed. With proper attention to crop pairing and timing, we can “squeeze” in an extra harvest before the main crop needs to take over the whole bed space. Good squeeze crops are generally mature and harvested within 50 days from planting, and they are always paired with main crops that mature after 55 to 60 days. Also, our squeeze crops tend to be “light feeders,” having less demand for water and fertility compared to their main crop counterparts. This approach works well on our 32-inch-to-36-



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Bok choy intercropped with broccoli. After these bok choy are harvested, the broccoli will continue to grow, filling in the empty space left by the bok choy.

inch wide bed tops.

Timing is critical! Always plant squeeze crops on or even before the day of planting the main crop, especially if the squeeze crop is to be direct seeded. In 2022, I got a little lazy about that rule, sometimes coming back

two days after transplanting the main crop to seed my squeeze crop. At harvest time, I more often noticed decreased crop quality due to overcrowding, light competition, and poor air flow.

In spring and fall, all our large brassicas, which are planted in two rows at 15 inches to 20 inches apart, depending on the specific crop, are paired with a single row of a squeeze crop down the middle of the bed. Radishes, salad turnips, baby greens, spinach, cilantro, dill, small bok choy and baby head lettuce all fill this context well.

Full-sized head lettuce and escarole are both possibilities, but at 55 to 60 days to harvest, they are more marginal, sometimes yielding a decent crop, while other times ending up too crowded. I don't like scallions as a middle row squeeze crop, because even if they are transplanted, they take too long to mature and are a little more involved to harvest, compared with head lettuce, for example. At that point the larger main crop is more difficult to work around and more easily damaged.

For warm-season high tunnel crops like tomatoes and cucumbers (actually planted in early March here in North Carolina) grown in a single row down the middle of each bed, we plant a row of squeeze crop down each side of the bed. Generally, we use the same group of squeeze crops here as we plant with our cool season brassicas. However, scallions, large head lettuces, and escarole, which are marginal as a middle row squeeze crops,



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have greater potential on an outside row where they are less likely to get shaded out by the main crop.

When we first started experimenting with intercropping (the second time around) we planted grafted tomatoes down the middle row of what would normally be five rows of Salanova lettuce in a bed. Thus, two rows of lettuce down each side of the tomatoes. The resulting lettuce crop was beautiful and plentiful, but the tomatoes certainly faltered until the lettuce was harvested and removed. Only then did they recover and begin growing as they should.

This is not how successful intercropping should work. Successful intercropping is when both crops are able to grow to maturity in the same space, concurrently, with little to no sacrifice made by either crop. We had a similar result when I tried planting celery down the sides of a trellised cucumber crop. The celery was amazing, but the cucumbers definitely suffered. Celery is prob-



(Left) Ground-level view of salad turnips planted between two towering rows of snap peas. (Right) Overhead view of two rows of bush beans. The buckwheat intercrop has just been trampled and left to remain in the bed as mulch.



ably a marginal squeeze crop, due to its length to harvest and high demand for water and nutrients. It might make a great main crop, with a squeeze crop down the middle.

For other high tunnel crops like peppers, ginger, turmeric, sugar snap peas and basil, all of which we

grow in two rows per bed, we are able to squeeze in another crop down the middle, before they get shaded out. The high tunnel is a great place to start experimenting with intercropping because it tends to get more attention than field space, and the potential benefits are so great.

We used to have a much more pronounced gap in production through the months of March and April when our high tunnels were already planted in summer crops and our spring field crops had not yet started to produce. It was painful at that time to watch such valuable real estate be monopolized by those wide-spaced tomatoes, cucumbers, and peppers. Now, by intercropping, we are able to plant all that space in between and close the harvest gap between winter greens production and spring field crops.

In the summer field crops, we tend to intercrop less. Some crops like summer squash, field cucumbers, watermelon, and winter squash do not share very well. They tend to cover their beds so quickly that the squeeze crops I have discussed so far would get overwhelmed. Also, we cover these cucurbits at transplanting time with row cover as pest prevention, making the space under there even more inhospitable to our



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Trellised cucumbers with escarole intercrop ready to be harvested. All images courtesy of the author.

squeeze crops which are generally considered cool season crops.

Bush beans, however, are one crop we do try to intercrop in the summer, though it tends to be more challenging than the cool season main crops. Direct seeded in two rows per bed, bush beans have out-competed and smothered any of the squeeze crops we have mentioned so far. Transplanting sweet corn down the middle of the two bean rows was an interesting experiment for a couple years.

While we don't see sweet corn as a profitable crop on a market farming scale, we do like to eat it, so we are always looking for ways we can squeeze in a little sweet corn somewhere without sacrificing production space. Intercropping seemed like the perfect solution. We found that by transplanting, the corn was able to grow above the height of the beans before it got shaded out. We hoped that the tight spacing of 6 inches would help with pollination, since planting only a single row is not ideal for plants like corn that are wind pollinated.

The first year, while pollination was far from perfect, we were able to harvest enough sweet corn to satisfy ourselves, and the beans didn't seem to mind sharing the bed space. The huge increase in biomass added to the bed by the corn when we mowed those crops down was a great bonus. The next year, we used the same strategy, only in a different field where the beds and rows hap-

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Trellised tomatoes with transplanted cilantro along one side and direct seeded arugula down the other.

pen to be aligned parallel to prevailing winds (instead of perpendicularly as in the previous year). With that one change, the result was near perfect pollination, more corn than we needed to eat, and suffering beans with shriveling pods, having been out-competed by the corn for the available water.

So, while it seemed like a good idea, and I do like to eat corn, it didn't seem worth potentially hurting the crop we were actually growing for market. Our compromise with the bush beans has been to seed a row of buckwheat down the middle. Buckwheat is less dominating than corn and quicker to maturity. We usually leave it to flower for a bit and then trample it and chop it with a shovel, leaving the buckwheat residue as a mulch for the remaining bean crop. While we aren't adding any direct economic benefits by intercropping with buckwheat, we do get the added benefits to soil health.

Certain squeeze crops, like baby greens and herbs like dill and cilantro, will need to be terminated and removed (or possibly left as mulch) after their final harvest, otherwise they will continue growing and create space competition for the main crop. I like to leave a few plants of cilantro or arugula to flower every 20 feet or so to attract predatory insects. Yet, leaving the entire row was a mistake, resulting in a whole row of flowering cilantro flopping onto the heading broccoli, and causing them to rot.

When growing arugula, lettuce mix, or any other

baby greens as a squeeze crop, it is worth noting that you give up the possibility using any sort of greens harvester. We used to use the Quick-cut Greens Harvester for baby greens, but it is too wide to fit between the outer two rows. In our context, this has been a reasonable compromise. Also, there is no guarantee of a second cut from baby greens when grown between two rows of main crop.

As long as I am not absolutely planning on needing a second harvest, I see this as acceptable. There was no extra bed preparation needed for planting this crop, I get the benefits to soil health, and I get a good harvest of a high-value crop without any added fertilizer or without needing to cultivate more land. I might need to seed a little more frequently, but in our context, we see this as well worth it.

While I would probably not recommend intercropping for the beginning grower, a little experience with the life cycles and habits of a handful of plants, and good awareness of your farm's context, gives a good framework to start experimenting and see what works for you.

Jamie Davis runs A Way of Life Farm with his wife, Sara Jane, in the foothills of western North Carolina, where, with the help of their crew, they grow Real Organic Certified produce and raise pastured pigs.



Episodes in March:

- Don Tipping of Siskiyou Seeds
- Martijn van Stee of Enza Zaden on rootstock breeding and grafting
- Ann Molloy of Neptune's Harvest on making and using fish fertilizer
- Erin Benzakein on breeding and releasing the first round of Floret Originals



Online farmers market

A small-scale, community-based farm store

By Jason Townsend

We can't all live near Manhattan, Boston, Montreal, San Francisco, Ann Arbor, Madison, or any number of other awesome markets for organic produce. In my experience as a farm manager on farms in the Hudson Valley, Finger Lakes, and Sacramento Valley, you can sell it all, all the time, in those markets. Not so in the myriad small markets many of us find ourselves in.

For my own permanent farm, I landed in a small, but growing and enthusiastic market near Utica, New York. We are in the relatively low-income Mohawk Valley — a beautiful place to live and farm that also happens to lack big cities, clientele with large disposable incomes, or a hot restaurant scene. We do have some outstanding, nationally ranked restaurants, and they work hard for every dollar they earn.

Many of us live and farm in similar smaller markets. Maybe yours, like ours, is solidly middle class, lacks the bright-lights-big-city, lacks the sprawling suburbs, but does have a strong core of people interested in and highly supportive of healthful, local foods. Maybe that core group acts as ambassadors for local farms, helping spread the local food scene little-by-little in your



(Left) As produce, baked goods, and meats arrive from farmers, they are arranged on tables by customer name for the 5-6:30 pick up window. (Right) Pre-ordered produce is grouped by customer name.



area.

Maybe a big part of your job as a retailing farmer is educating people about the differences between grocery store produce and local produce, industrial organic and local organic. You pull in customers one-by-one, not in huge hauls. Maybe you, like us, read about the successes of food hubs and farm stops with a bit of envy — if only we could pull that together here.

What I describe in this article is a low-budget, low-risk food-hub-adjacent initiative that has been working for us in our small market, and that we think could also work

for many of you. It is a local, farmer-driven, full-plate sales outlet. It has a lot of flex to it and does not require a major investor or a grant to get it going, just someone looking for a side hustle and a group of willing farmers.

In 2022, JB Riffle, then a local teacher, now the Executive Director of the Farmers Market Federation of New York, and one of those all-important local food ambassadors, started Local Foods Mohawk Valley (LFMV). It's a simplified online sales platform that acts as a scaled-down (which for us at this time, is the appropriate scale) food hub/farm stop. Importantly, each farmer involved has full access to the back-end of the website and full control over inventory and price points.

JB decided on and maintains a 90-10 split, which is both a generous give to the farmers (more akin to retail than wholesale) and a solid keep-the-system-well-in-the-black-with-a-bit-of-side-hustle for JB. I'll break down the process of getting LFMV going into the following



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sections: Initiation Phase, Weekly Logistics, and Future Hopes.

Initiation phase

Choose an online platform. All of us growers know there are many options out there. For a price, you can get a lot of flash from some of those options, which again, might be an awesome business move in a hopping market. JB chose the admittedly unflashy EatFromFarms platform. (And please note: The intent of this article is not to support or criticize any specific online platform, but rather to breakdown our experiences.) EatFromFarms (EFF) is inexpensive and its developer George Duggan is highly responsive to emails and phone calls. It might not look like a polished web interface (my opinion, and, ok, there's a critique) but it gets the job done. The price point is also exceptionally affordable.

Recruit farmers. Just like a farmer's market manager or a store produce manager, JB reached out to a cross-section of the local farming community: a few veg growers, a few dairy folks, a few pastured meat people, a honey guy, a maple syrup farm, a couple bakers ... you get it. A nice selection, but one that avoids overly similar farms stepping on each others' toes.

Give those farmers full access to the website. With EFF, each farmer can create his or her own password-protected account, and there is unlimited space to add new vendors. Each farmer then has full access to the backend of the website for farm products. Farmers, therefore, control their own inventory, item descriptions, item photos, and pricing. JB is completely hands-off in this department, allowing the farmers and makers themselves to determine what gets listed on a week-to-week basis and how much it should sell for. I think this is a key determinant of the success of this system: we farmers remain as "price mak-

ers" not "price takers."

Develop a customer base: JB started with an email list that has grown steadily. Participating farmers have contributed contacts to this email list, but are not required to. LFMV has done what all of us in the local foods business are pretty familiar with: find creative ways to get the word out — email, social media, word of mouth, paper brochures, time spent interfacing at farmers markets, etc. Recently, JB sent out over 4,000 postcards to local addresses. We'll see how this impacts sales over the coming season.

Pick a distribution site. LFMV distributes once per week (more on this in "Weekly logistics" below). Finding the right site for distribution is probably the trickiest part of this system. For LFMV, the original distribution site was in a church with a large open entrance space and ample parking. JB paid a monthly fee to use the space. This worked well for several months, but then another even more convenient opportunity opened up to move distribution to a local private pre-school gymnasium where JB taught.

JB is able to use this space for free, but as you'll see from the following information, the space is only needed about four hours a week. You can imagine any number of other potential arrangements for a distribution site: churches, schools, municipal buildings, a well-located and clean garage, a barn, etc. The important thing is to land on one that works well for everyone and is consistently easy to access. JB also carries a liability insurance policy that covers this distribution set-up — an important step for anyone developing a similar program.

Infrastructure needed. Portable coolers are the big one. As eggs, dairy and frozen meat arrive for distribution, they need to be kept cool. JB invested in a number of large coolers (which, importantly, he is

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able to stack and store on-site). Tables are the other big need. Fortunately, at the current site, a large number of folding tables are already available. JB is able to set these up, clean them down, and put them away with minimal effort. You'll also need a good, reliable printer to print out the weekly "Product Pick Lists" and "Customer Assembly Lists."

Weekly logistics:

Develop the schedule. In our case, it works like this: Tuesday is delivery and pickup day. Online customer ordering is open from Wednesday 6 a.m. to Sunday midnight. Newsletters and reminders go out to the customer base on Thursdays and Sundays. There is no ordering on Mondays, giving farmers a chance to download their "Product Pick List" and gather product together. Product is delivered to the local gymnasium on Tuesdays between 3:30 p.m. and 4:30 p.m. Customers pick up almost immediately afterwards, with a pickup window from 5:00 p.m. to 6:30 p.m. So far, this once-a-week schedule has worked very well for us. Depending on your situation, you might want to have multiple days, or might find that weekends are preferable.

Delivery and distribution: Each individual farmer can download their individual "Product Pick List" from the EFF website anytime after midnight on Sun-

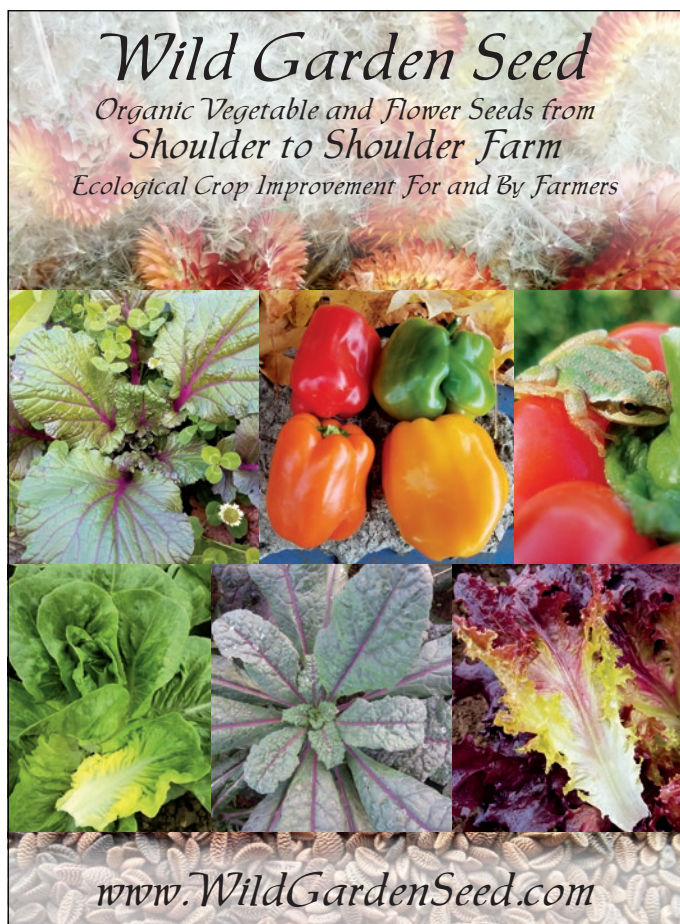


Local Foods Mohawk Valley recently send out 4,000 postcards to local addresses to drum up business.

day. For my farm, Monday is always one of our three harvest days of the week, so Tuesday works well for us as a delivery day. That said, on the Tuesday of distribution, farmers must drop off their product within a narrow one hour window, 3:30 p.m. to 4:30 p.m. This can seem tight, and for us on a busy produce farm, it is. As it happens, we also do a large CSA distribution on Tuesdays, and frequently find ourselves wishing the drop off timing for LFMV was later in the day. Generally, one of my workers is able to get the timing right so that the day ends with a delivery to LFMV right at 4:30 p.m.

But you can imagine the occasional logistical challenges of this during the heart of the season. We have no problem making our winter distributions on time. JB and some volunteers (family members and local college students) inventory the produce and distribute it on large tables with a printout of each customer's order. It is important to thoroughly check-in each vendor's product to make sure there are no mistakes. The time window between farmer drop off and customer pick up is tight. The customers filter in from 5 p.m. to 6:30 p.m., logical after-work timing to swing in and pick up a bounty of local goods.

The money: JB collects a \$3-per-order service charge to help cover the costs of the online site, space rental, and basic liability insurance. This service charge could be adjusted in either direction to suit an individual's needs. So far, this service charge does not appear to be an issue for the LFMV customer base. In turn, each grower receives 90 percent of whatever price they have set for the items they sell on the site. EFF has an accounting page that neatly summarizes each vendor's monthly sales, making this an easy calcula-



tion. JB writes checks to vendors on a monthly basis.

And that's the gist of it. How do the farmers and makers feel about the system? When I ask other vendors, everyone is, well, happy. It is an expanded sales outlet with minimal effort on the part of each individual vendor, and it works to combine some of the best aspects of direct marketing and wholesaling.

For our produce farm, it's been a great way to move products that we have in super-abundance during the heart of the season, and we find it is an especially lucrative outlet for winter sales. We put tons of storage crops in walk-in coolers each fall and also grow microgreens. I feel confident selling a large portion of this through LFMV, and rarely have to resort to taking a true wholesale price from other outlets.

Other farmers coming in from greater distances (some drive up to an hour) have mentioned that they really appreciate the chance to have concentrated sales in one place and in one short time period and no long day at the market tending a stand for these sales. Farmers are also receiving a solid, very-close-to-retail return on their efforts with LFMV. Monthly pay-out can sometimes be an issue for farmers who have a lot of their product pending at this one outlet, but again this is an aspect that can be adjusted.

When I ask customers how they feel, they're thrilled. LFMV very much meets that standard of loca-

vore "full plate" shopping. We have some extremely talented farmers in our area, but they are pretty widely scattered: LFMV draws everyone into one place.

Future hopes

Where could this go in the future? We don't know. Our area is certainly in an economic upswing and the core of serious local food boosters keeps growing, so we all keep dreaming and scheming, that's for sure. We bat around new ideas, such as perhaps adding a chefs' pickup day, where orders are exclusively for restaurant owners; maybe expand to separate distribution days in separate local regions; the potential to add deliveries for customers and delivery conglomeration for farmers. Lots of possibilities.

One thing we do know for sure is that this system has expandability and flexibility to it, with low risk on all fronts. We especially think it is an appropriate vehicle to test the viability of a food hub/farm stop/co-op in your area. Who in your area might run a version of this? Maybe, like us, a local food booster looking for a meaningful project. Maybe a farmer parent or spouse looking to support local markets. Perhaps a farm worker/intern looking for more involvement and some side-hustle income. A retiree looking to invest time? Local chamber of commerce or cooperative extension?

However it might work out, if you're like us — a bit envious of



farmers who have really booming sales outlets in their areas — we are certain this can be a low-risk, low-stress pilot for testing the waters of your smaller market.

Jason Townsend is the owner of Kingfisher Farm, a certified organic vegetable and fruit farm near Utica, NY. Kingfisher Farm is 12 acres of vegetables, orchard, small fruit, and a tree nursery marketing through CSA, farmer's markets, and online sales.



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Lessons from a first-year no-till market garden

By Noah Poulos

If you're like me, you've probably seen endless footage and photos of pristine looking market gardens where all the plants look amazing and there is nothing to do but plant and harvest. A good market garden can get to a point in which pest and disease pressure and fertility issues become virtual non-factors, but that is not the story in a first-year no-till garden.

Don't get me wrong, we are very happy with how our first year went at Wild East Farm in Marion, North Carolina. On less than 1/4 acre we harvested thousands of pounds of food and sold over \$30,000 in produce. And we wanted to share all the lessons we learned from a first-year no-till market garden in hopes that others can use the knowledge.

Establishing the beds

To offer some background, we used a deep compost system to establish our no-till beds. Our first year we had two different methods of site preparation — mostly a factor of how much time we had to prep the ground. For our first garden block, which consisted of forty 50-foot beds, we were in a time pinch. We moved onto the property in November of 2022 and wanted to start planting by March. I opened up the plot using a borrowed spader implement over the winter and in February began making beds directly on the spaded ground.

To establish the beds, I built a wooden frame out of scrap wood that was 25 feet long, 30 inches wide, and 5 inches deep. The 25-foot length worked well for our plans, as we wanted all of our beds to be in multiples of 25 feet, either 50 feet, 75 feet, or 100 feet. The 30-inch width standardized the bed widths to match all of the popular market garden tools which are designed around 30 inches. Using 5-inch boards allowed us to also standardize the depth of compost applied to each bed.

Using a borrowed Bobcat from a neighbor or our tractor bucket, we laid out the frame in the location of the bed, dumped the compost into the frame, and raked it smooth to the level of the top of the frame. After we filled the frame, it went down the bed to continue it or was moved over to the next bed.

For the second set of garden blocks we built last year, we used a more intensive and, in my mind, better site preparation protocol. First we ran pigs through the plot for four weeks in February and allowed them to do an initial



The market garden in the full abundance and beauty of July. All images courtesy of the author.

tilling. Once we moved the pigs off of this paddock, I went through again with the spader and followed that by sowing a buckwheat cover crop.

By May, the buckwheat was in full flower and I scythed it down and we laid silage tarp over the area until August. The three months of occultation broke down the immense amount of organic matter from the buckwheat and smothered any weed seeds that germinated. In August, we removed the tarps and built beds using the same method as before.

We chose this method because it offered a quick and smooth work flow. Two of us could easily build twenty 50-foot beds in just half a day, as opposed to the labor of doing it with wheelbarrows. There are drawbacks to this method, however. The repetitive driving of heavy machinery over where the beds will be laid certainly compacts the soil. We took care only to do this in dry weather, so as to minimize this impact, but it was noticeable. More on this later. Ultimately, we prioritized saving our backs and saving time and I have no regrets about doing so, as this is the only time heavy machinery will ever be driven in these spaces.

Sourcing organic matter

Once the beds were made, we immediately could start planting. This is only the case because we had the foresight to purchase the compost over a month in advance of



Dumping compost into our makeshift bed frame using a tractor saves our backs and a lot of time. We make sure to broadfork where the tractor has already driven before applying compost to new beds.

applying it. I knew from experience managing another farm that this particular source delivered compost very hot and very dry. The process of loading the compost into their truck reignites the composting process, which is why it was always so hot on arrival.

Trying to plant into hot, dry compost will lead to some very unhappy plants. By getting it delivered ahead, it was able to finish properly and get rained on enough that it would be ready to plant into once we made our beds.

Another note on compost is that of availability and cost. We are fortunate to live within delivery distance from one of the better compost producers in our area, Atlas Organics. They can deliver by the tractor-trailer load which comes out to about 50 cubic yards. That quantity runs us about \$1,300 per load, which is a significant investment. However, that level of investment is only necessary in the establishment phase to get that first thick application down.

After that, we can apply just 1 to 2

inches per year on each bed and maintain a thick enough sheet to maintain a deep compost system. We also see it as an investment in topsoil and fertility that negates the necessity of purchasing a tractor or BCS and implements and the running cost of fuel. The \$1,300 worth of compost covers about 20 of the 50-foot beds and can pay for itself from a few crops off a 50-foot bed in the first year. Those numbers work for us.

For the pathways, we applied wood chips in the same thickness as the beds so that the paths and beds were level. This reduces erosion from beds into paths and creates a very ergonomic layout whereby stepping over and straddling beds is very easy — even for short-legged people like myself.

I like the chips, but there are limitations and drawbacks. Firstly, it is

hard to keep them from getting into the beds. The odd chip on a bed surface does not bother me. But chips washing into or getting kicked into beds and then getting incorporated at bed flips has caused some noticeable nitrogen availability issues in small patches. We observed that plants growing where chips got incorporated into the compost performed very poorly and rarely made it to harvest. Also wood chip availability is a challenge in our rural setting. We get the odd delivery from local tree companies and utility services, but they are often not in our area so we have to take what we can get.

I purchased two tractor-trailer loads of chips in the first year to get us started. The first I bought in January and it cost about \$650 for a full tractor trailer. Again, I purchased a load in April which ended up costing \$1,300.



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It did not occur to me until afterward that the spring sap flowing in the wood of trees would add so much water weight, and the lumber mill I was buying from charges by the ton. By purchasing chips in the winter, when the cut trees are dry, I saved over \$600 in what was just water.

This was an important lesson. In the future we may go toward using straw in pathways or just allowing compost in our pathways. For now, we are happy with the wood chips as they soak up extra moisture, provide an exceptionally clean working environment, and are adding loads of organic matter to the system. However, I am not attached to using them for the long haul.

What about the vegetables?

Now to the vegetables. The key takeaway in my experience using the deep compost system is that in the first year leafy crops and fruiting crops absolutely love it, whereas root crops are not so happy. Just eight weeks after planting, we started to have bumper crops of kale, cabbages, spinach, lettuce, and asian greens. That first summer, our tomatoes, summer squash, and peppers produced like I had never seen before.

Root crops were more of a challenge. While we grew some nice radishes and turnips, we had very limited success with beets and carrots. With the carrots in particular, I believe they grew past the compost layer and hit the compacted soil underneath, altering their shape and affecting their growth.

Additionally, very fine humic compost can develop somewhat of a surface compaction from rain and irrigation. This is partially why we invested in a tilther that has turned out to be very critical in our bed flips at this stage and part of why I think the root crops did not do as well as the other crops. We also only grew root crops in the first plot we established, which has a much heavier clay soil underneath the compost than our

newer beds, and leads to poorer water infiltration and gas exchange beneath the compost layer.

While this was an issue this year in our context, I strongly believe that these issues will resolve themselves with time. By broad-forking and tilthing at each bed flip and allowing crop roots to decompose — and regularly adding additional compost — any compaction issues that we experienced in our first year will resolve themselves within two to three years. To anyone planning to go with this method, I would strongly suggest against planning on producing too many root crops and rather leaning on greens and fruiting crops in the first years.

Weeds and pests

Weeding is a question that comes up a lot around no-till. Proponents claim that weed pressure drops dramatically and skeptics don't understand how it is possible to manage weeds without tillage and mechanical

cultivation. In our first year, weeds were virtually a non-issue. Once a week between May and September I spent approximately 20 minutes pulling weeds. Even this amount of weeding was not a total necessity and had more to do with my preference of having a totally weed-free garden.

All the weeds that came up were perennials that poked up through the compost. Nutsedge, buttercup, dock, some shallow-rooted grasses, and a small, dreaded Bermuda grass patch were the only weeds we saw. Not a single annual weed appeared. While this likely will change as weed seeds blow in, I am confident that it will not ever become an issue because the conditions for annual weeds to germinate are not there.

Annual weeds are 'earth repair mechanisms' and are simply fulfilling their ecological role of attempting to rapidly cover bare soil. Since our soil is never bare and is constantly covered in a compost mulch that also acts as our growing medium, annual



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weeds, even if the seeds are present are not stimulated to germinate. Now that we've invested in the right tools to have very uniform spacing, hoeing with a wire weeder and occasionally hand-picking, perennial weeds will be short work that we only do a few times throughout the season. That allows us to spend most of our time harvesting, flipping beds, and planting.

In regards to pest and disease pressure, we use as few sprays as possible, all of which are organic. In our first year all I applied was Bt (*Bacillus thuringiensis*) to brassicas in order to eliminate cabbage moth caterpillar damage. In addition to that, I applied a weekly spray of actively aerated compost tea. That is all.

All other issues that came up were a matter of issues in the soil or fertility imbalances that impacted the plants' health. In our most poorly draining soils, we had some issues with anaerobic conditions leading to disease. Rather than trying to acutely fix those problems, we took them out of production, put them into cover crop, and will continue to de-compact and fix them over time.

If we saw aphids, that to me indicated too much nitrogen, I deduced I should reduce spraying compost tea and fertigrating crops. These adjustments helped and it is the type of mindset that we are going to proceed with as much as feasible, as we'd rather focus on what it takes to grow healthy plants than finding the best product to apply.



Caterpillar tunnels fit beautifully into a no-till set up and can easily be moved around our permanent beds.

Future plans

As I write this we have a future garden plot that is tarped for the winter and that we will make more beds on in February for March planting. We are going to use the same methods to establish these beds, and I expect some of the same first year issues to exist there. That is okay. It is a matter of tradeoffs at the end of the day. I am happy to take on the challenges of establishing a no-till garden if it means that we won't be reliant on machinery for vegetable production. I am also very excited to learn our context



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Greens crops looking good in the late spring. Note the wood chip pathways are as deep as the compost.

specific challenges that come out of using this system. So, it is hard to even frame ‘failures’ in the negative; they are all just learning opportunities.

After implementing and working in the deep compost no-till system, I am firmly a proponent of its viability and merits as a method for producing commercial vegetables. That said, I think it is only truly viable in this form on a very small scale. I have a hard time imagining these methods working on a scale of more than a few acres, but I would be glad to see examples proving me wrong.

We like the micro-scale and like growing our production by intensifying rather than increasing space. If you are curious about no-till growing, dive into it, learn from the challenges and be inspired by the successes. It is a truly beautiful way to grow produce. I deeply value our commitment to not being reliant on expensive tools and machinery to provide our community with vegetables all year long.

Noah is a farmer, writer, and educator that has gratefully called Western North Carolina home since 2014. At the core of all he does is an interest in relationship, both human-human and human-earth. This is why he farms: so that he can spend as much of his waking life as possible engaged in all forms of deep relationship with his community.

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By Josh Volk

An email from a reader got me thinking about seed drills, those tools we dump seed into, and then push or pull down a bed to set the seed into the ground at just the right spacing and just the right depth, all in a straight line. A lot of folks probably just call drills “seeders” these days and I’ve had the opportunity to use quite a few different ones over the years so I thought a little overview of some of the basic features might be helpful for folks starting out or thinking about buying a new seeder.

Typical to seeders is some sort of opener that creates a furrow, followed by a metering mechanism that controls the amount of seed dropped into the furrow, and then by a closer that closes the furrow and covers the seed. The other common parts are depth control wheels, drive wheels to power the metering mechanism, and press wheels to give good seed to soil contact. Depending on the seeder, the depth control wheel or wheels might also function as the drive wheel and/or the press wheel. Sometimes there is no drive wheel but the metering mechanism is driven by a separate motor. If the seeder is pulled by a tractor that motor might be the tractor’s

motor either via the PTO shaft or hydraulics.

Here are few examples of seeders described so as to explain the typical parts and to give some benefits and drawbacks of different designs.

Many growers are familiar with the Earthway “Precision Garden Seeder,” which isn’t all that precise, but is relatively affordable, and versatile in the range of seed sizes it will handle. It’s also relatively easy to understand mechanically. There is a front drive wheel that uses a rubber belt to drive the metering mechanism for picking up and dropping the seeds. The belt drives a hub on the hopper. To the hub you can mount different plastic plates which sit inside the seed hopper. These plates have little scoops with holes and as they rotate, they pick up seeds from the bottom of the seed hopper and then lift them to a chute where they drop out of the hole in the plate.

The seed travels down the chute and falls into a furrow that is created by the wedge-shaped opener. A chain that is dragged behind the opener pulls soil back into the furrow and then the press wheel in the back firms that soil over the seed. The depth of the furrow is set by moving the opener up and down vertically, while the two wheels keep the whole



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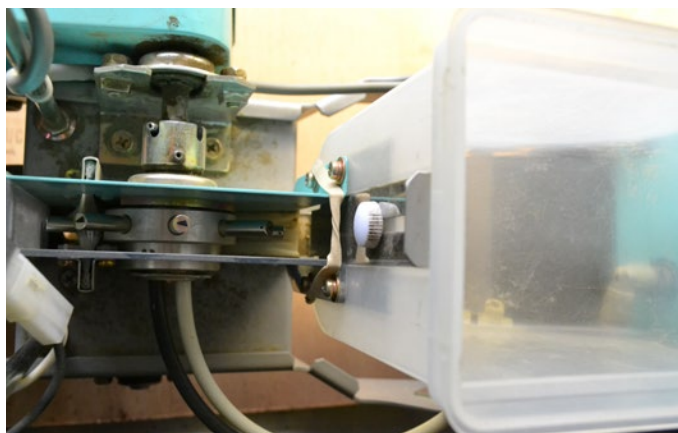


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(Left) The Seed Ace Vacuum Seeder uses a battery powered vacuum to pick up seeds one at a time and drop them very evenly in the row. (Right) The Seed Ace hopper has a hole at the bottom where a gate regulates the flow of seed going past rotating vacuum nozzles. The nozzle size can be changed for different sized seeds, and the rotation speed is determined by cogs used in the chain drive.

thing level. By varying the size, shape and spacing of the scoops and holes in the plates the seeder can vary how many seeds it picks up and how often it drops the seeds down the hole.

A far more precise seeder, but one that has the same basic parts, just in much more refined versions is the Seed Ace Vacuum Seeder. The drive wheel on this seeder drives the metering

mechanism with a chain instead of a belt, and the cog sizes can be changed in order to change the spacing between seed drops. Seeds are picked up by vacuum nozzles which are much better at singulating the seeds. The furrow is opened with double disks which cut a much cleaner furrow and don't clog with debris as easily as a wedge. Instead of a chain to close, there is a

spring-loaded plate that fills the furrow more evenly.

The difference in cost between these two tools is more than an order of magnitude – less than \$200 for the Earthway versus about \$4000 for the Seed Ace. There is also a significant difference in weight and ease of set-up between seed types. To switch between seed types on the Earthway you just change the seed plate, which is relatively quick and easy and requires no tools, and you may also need to change the depth setting which is also tool-less with just a wing nut.

The whole thing is relatively light weight so to empty the hopper you can just turn it over and pour the seed out. That light weight makes it relatively easy to carry around, but it means that in heavy soil it doesn't really want to dig a furrow or go straight. Different seed plates let you seed everything from small brassica seeds up to very large lima beans, but all with limited precision.

The Seed Ace seeds a narrower range of seed sizes, with beet and chard being on the large end. It also takes longer to adjust between seed types and requires tools for some of the adjustments, but that adjustability is part of the reason it can be truly precise. The heavier weight and disk openers are much better at opening a furrow through heavy soil and at holding a straight line.

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(Left) In the example above there is a four bar mechanism (parallelogram) which allows the seeder to float up and down. You'll also note that the rear press wheel is spring loaded to maintain consistent ground pressure. (Right) Six Earthway seeders that have been slightly modified and fitted to a frame that will fit under the belly of an Allis Chalmers G tractor. There are better solutions these days for seeding multiple rows but this can work. There is some float built into the frame which allows the seeders to sit flat on the ground (as long as the ground is flat). One method for emptying fixed hoppers like this is to use a cordless handheld vacuum cleaner – just make sure it's completely empty first!

A middle ground between the Earthway and Seed Ace is the popular Jang seeder, and there are two similar versions for small to medium seeds, the AP1 and the JP1. I wrote about these seeders back in 2020 so you can look back at the specific differences between those two in that article. The Jang seeders again have a similar form to the the Earthway and Seed Ace but the metering mechanism is different. Like the Seed Ace there is a chain drive with sprockets which helps to vary the rate of seed drop. It also is available with

a double disk opener, or comes standard with a wedge type opener.

The metering mechanism for the seed is a plastic roller with divots in it. By varying the number, size and shape of the divots the seeder can be used to plant very small seeds up through corn and pea seed, although it's really best with seeds no larger than beet seeds and there is a larger TD1 model that is specifically designed for large seeded crops. There are far more rollers available for the Jang than there are plates for the Earthway and that, combined with the ability to change cog sizes on the chain drive means there's more adjustment possible. Again, this one is heavier than the Earthway making it harder to lift, but easier to use in heavier soil.

The Jang seeders also have a longer wheelbase than the Earthway. The distance between the front and back wheels matters, with a longer wheelbase being a bit less maneuverable in tight spaces, but improving straight line tracking. Because the wheels are also used as part of the depth control, having a longer wheelbase means that any bumps or dips in the bed have less of an impact on the depth of the opener.

In addition to the longer wheel base they also have a removable seed hopper, which makes emptying leftover seed a little easier. This is a common feature on heavier seeders as there's not really a good way to turn the thing upside down, but it adds complexity and cost and creates more parts to potentially break at some point.

Back in the days when the Earthway was really the only readily available push seeder for market gardeners in the US, a lot of growers would buy multiple seeders and gang them together to seed more than one row at a time. This worked decently well for two rows, but if you get up to three rows the problem becomes bridging if your bed isn't dead flat – and many seed beds in the field aren't, despite appearances. If one part of the bed was higher than the others, two of the seeders would lift the third seeder (or the rest of the seeders if

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(Left) You can see the underside of a Johnny's six row seeder above, and even larger seeders would look similar from below. (Right) The Johnny's 4 row seeder is one of the simplest and smallest seeders making it good in tight spaces. Unlike most other hand scale seeders it is designed to be pulled rather than pushed. All images courtesy of the author.

you had more than three in a gang) off the ground. The problem here is that if the drive wheel is off the ground no seed is getting dropped, or if the furrower comes off the ground the seed just sits on the surface.

With tractor mounted seeders there are a few common methods of avoiding this problem that don't involve going to extra measures to make every bed billiard table flat. One of those measures is allowing each seeder to float independently. In the example above there is a four-bar mechanism (parallelogram) which allows the seeder to float up and down. You'll also note that the rear press wheel is spring loaded to maintain consistent ground pressure. The seeder pictured (I forget the brand) has a unique opener which is essentially a large double disk opener with the metering mechanism built in. Chains dragging behind the press wheels loosen the surface after the seed is pressed in place, which helps prevent surface crusting over the seeder track, a problem in some soils causing poor seed emergence.

When seeding a crop like salad mix, rows tend to be very close together and it's desirable for beds to be dead flat to aid harvest tools so instead of having the seeders float independently it's typical to have one large wheel, or roller in the front, flattening the bed, and to do the same for the press wheel, keeping the surface of the bed as flat as possible.

The Johnny's six row seeder again

works very similarly to the Earthway, Seed Ace and Jang, and is most similar to the Jang in that its metering mechanism is essentially a roller with different sized divots for different sized seeds, and the drive rate for seed drop spacing can be varied by changing the cog (or in this case, pulley) size. The diameter of the rollers on this seeder are significantly smaller than the wheels

on the other seeders, but because they are so wide they still float on the surface. They don't do well with larger clods, but they are designed to be used on finely prepared seed beds with small seeds so it's not typically an issue.

Before the six row seeder came out Johnny's 4 row seeder was popular with small salad growers. This again uses a roller mechanism for metering, but one that is directly driven by small wheels on the sides of the seeder, with no press wheel at all. By moving the drive wheels to the side and eliminating the press wheel cost was saved, but so was weight and length, making it one of the easiest seeders to use in tight spaces. Because there is no drive wheel in front and press wheel behind depth control is by tilt angle; and many growers would roll over the beds with a separate tool after putting the seed in the ground to press it into place more firmly.

There are many other seeders out there in the world, but these are the most common types I see on farms here in the US. They provide a good

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A Johnny's six row seeder, Earthway, and Jang all sitting on a farm cart in the field. The six row seeder is upside down showing the six openers which create the furrows for small seeded crops.

demonstration of the typical parts on most seeders, as well as illustrating the considerations when selecting a seeder for a farm. The types of seed it will handle, the precision needed, the soil conditions it will work in, the ease of adjustment and use are all important factors, not to mention the price relative to its ability to generate income for the farm. A \$4000 seeder would have to save you at least 100 hours of labor in thinning work, or increase yields proportionally to justify its purchase if you're already doing ok with the \$200 seeder. I own a Jang and its my primary seeder, but I'm not sure it's actually saved me any money over using an Earthway on my little farm. I do relatively little direct seeding and spend a lot of time swapping rollers and adjusting cogs whenever I do go out to seed so there is no time savings there. On the other hand, the heavier seeder with double disk openers never clogs with field debris for me, and I get more even stands so there's a bit of time savings and improved yield which may make up for the higher cost of the tool.

Making the decision of what seeder to invest in should take into consideration the cost of the tool, and also the costs of operating the tool, as well as any benefits or drawbacks for the crop you're seeding. One of the less obvious costs to consider may be changes to the way you need to prepare your seedbeds to accommodate the features of a particular seeder.

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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Sharing tools and equipment

Farmer-led cooperative arrangements for big purchases

By Jane Tanner

A group of North Carolina farmers created a co-op to share equipment and tools. They exchange them in a way that feels fair to everyone, and they manage the business of the cooperative without making too many demands on busy farmers. They've been at it for more than a decade, so the name, Tool Legit, is fitting.

Tool Legit is one of a handful of equipment sharing groups featured in this article. Arrangements for using the same tools come in many forms. Sometimes it's simply a casual, personal exchange. At the other end, it's established legal entities with complex agreements. In other cases, regional government agencies or non-profits are involved. The inventory of tools and equipment may be very limited or long, from hand tools to high-priced, large equipment, such as the soil steamer featured in this article.

Yet, in all cases the goals seem similar: to help farms reduce individual capital spending, improve efficiency, save labor, allow for new crops or techniques, scale up more affordably, access otherwise inaccessible specialized equipment or simply try out routine equipment before making an individual farm purchase.

Tool Legit in North Carolina

George O'Neal of Lil' Farm located 20 miles north of Durham in Timberlake, North Carolina, is a founder of the well-established equipment sharing co-op. "I was always borrowing equipment," he told me. He and farmer Kelly Owensby wrote a grant proposal to RAFI (Rural Advancement Foundation International) to start an equipment sharing group.

Before they knew the outcome, they went ahead and started a cooperative with five farms that swapped a tiller and a bush hog, while using a tractor from another farm. They got support from

the University of North Carolina Environmental Law School to help them write up articles of incorporation for a Limited Liability Corporation.

Then in 2011 the \$27,000 RAFI grant came through, and they expanded the cooperative to 10 farms. The first purchase was a \$4,000 dual axle trailer, then a second used trailer for \$1,000. Then, they added a ridger, a bush hog, a tiller, a disc harrow, a spring tooth harrow and a few other tractor implements. They wanted a spader but the \$10,000 price tag was too high. Fortunately, a retiring farmer gave one to the cooperative.

The highest-priced item the first year was a manure spreader for \$4,500. Alas, with that came a hard lesson. "When the first farm used the manure spreader, it broke, it had been put together wrong,"




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Tool Legit's list of shared tools and equipment. All images courtesy of the author, except where noted.

George said. “The equipment dealer we bought it from put it together wrong but wouldn’t cover the repair after it had been used.”

The \$500 repair came out of the first round of membership dues. Initially, each member paid \$400 a year. During the pandemic, they dropped it to \$250 and have left it there. The co-op doesn’t buy new tools every year, but George said they’re coming to a point where they need a cash injection. “We could raise it up to \$500 in a year to make a purchase,” he said. Meanwhile, 13 years on a lot of the original equipment has been replaced with new equipment, he added.

Right now there are 13 co-op members. They keep it at more than 10 but fewer than 15. Young farmers find their way to Tool Legit. They only take market farmers, not hobby farmers. They try to keep members within a 45-minute drive from each other, more or less.

They require attendance at an annual meeting, usually during winter, where they debate new purchases. Unanimous agreement is required to buy new equipment, a majority of farms is not enough. “We all have to agree to it or not get it,” George said.

They use Google email and a google group to communicate and arrange equipment exchanges. “We tried google calendar for a while, but people didn’t update it,” George said. The last farm to use a piece of equipment and trailers holds them until the next farm wants it. Their hydraulic wood splitter spends most of the time at a farm that heats its greenhouse with wood, while others periodically come and get it.

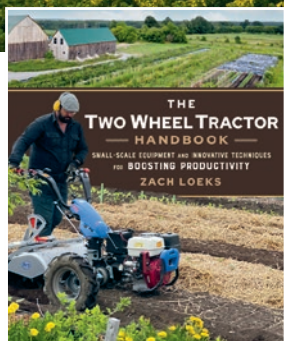


A Kootenay Local Agricultural Society Tool School event in partnership with Young Agrarians to educate users about the equipment offered and how to use it responsibly. Photo by Hailey Trook.

The tool and equipment inventory is kept on a shared Google spreadsheet that catalogs what they have and when it was last used. Every winter they track down every item and produce a maintenance report.

One of the most commonly swapped items is the Terrateck wheel hoe system used to weed hoop houses. With all its attachments they spent \$1,000. The flail mower also frequently makes the rounds to knock down cover crops. Each farm only needs the potato digger two days a year, but around the same time for everyone. Yet, George said sharing has never really been a problem.

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Ross Mickens of Open Door Farm in Cedar Grove, North Carolina, using the Tool Legit co-op's Checchi & Magli potato digger. Photo by Jillian Mickens.

He said the co-op steers clear of difficult people. "We don't get involved with pains in the ass," George said. "We're very handshake oriented." It also helps to choose members with differing crops and farm plans so there's less simultaneous demand for particular equipment, he added.

The tool inventory includes hand implements, such as a Jang seeder. "Sometimes the tool library is a way to try out equipment," George said. "They don't know if that's the one they need for their operation." For that reason, farms with more money don't tend to stay in the co-op too long. "People trial the tools," he said. "It's a library for a reason."

The members enhance each others knowledge of the tools, said current Tool Legit president Will Cramer from Ever Laughter Farm in Hillsborough, North Carolina. "Getting a lot of people using the same tool, you get a lot of ideas about how to use it and how to best use it," Will said. "We're country neighbors, if we didn't have the co-op I wouldn't interact with these folks. They were more acquaintances before the co-op, but now friends. I get a farm tour when I go to pick up equipment."

The co-op decided to bypass tractors because an insurance agent warned them about tractor-related lawsuits. They also don't share trucks or anything that drives.

While individual farms have their own insurance, the co-op purchases a basic damage and theft policy through the Farm Bureau. In general, if a farmer

breaks something while they're using it, they'll figure out the repair, but don't have to cover it financially.

"If you drop the tool in your pond, you might be on the hook for it," Will added.

So far, they've had no major accidents or problems, just a few annoyances. All George could come up with was that a member let her boyfriend use equipment for his outside business. As soon as they told her that wasn't cool, that stopped.

Will has been a Tool Legit member from the beginning. Knowing that tractor attachments were available through the co-op made his decision to buy his own tractor easier. It helped him scale-up his farm. Co-op farms range from 1 to 2 acres like Ever Laughter, while other members are working 4 to 6 acres.

Will leads the annual meeting, where they will hash out future purchases. On the wish list is a tractor backhoe attachment. Will said they'd have to find one that would work with all their tractors. At past meetings they considered a trencher, but he said many farms don't need to set up irrigation or work on drainage and trenchers are easy to rent.

Lately they've been debating a soil steamer. "It's the biggest item we've ever looked at," Will told me. "Things we're looking at now are more expensive with larger upkeep costs."

The \$30,000 and up price tag for the soil steamer is more than they have in the cooperative's bank account. Sometimes they have to save up for five or six years; also they're hoping to find the time to apply for grants. "It would be the most expensive purchase to date so there's no



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Nicolas Walser using the BCS power harrow at Linden Lane Farms.

consensus yet,” George said. “A few people really want it and a few people know they won’t use it.”

Shared soil steamers in New England

Starting in the fall of 2020, farms in New Hampshire have been sharing a Sioux Model SF-20 Soil Steamer purchased with \$29,995 in SARE’s (Sustainable Agriculture Research & Education) grant money overseen by the Cheshire County Conservation District. The conservation district is a good example of a county-run tool sharing model that makes high price tag equipment available at relatively low-cost rental fees to help support local farms.

Every so often the conservation district asked Bruce Wooster of Picadilly Farm in Winchester, New Hampshire, what equipment they ought to add to rentals. Bruce suggested a soil steamer, which he’d seen presented at a conference. “It’s out of reach for most in the farm community,” he said. “It’s hard to justify that kind of outlay.”

Bruce’s farm is the host site for the soil steamer. He learned to maintain and run it and has trained other farmers how to use it. A SARE’s trial assessed how the steamer helps farmers manage high tunnel crops and also evaluated how an equipment sharing model plays out. The final report is linked here: tinyurl.com/bdfj3dae.

Most of the farms are using the soil steamer to reduce chickweed in high tunnels. “For those overwintering greens and spinach in September and October, chickweed has been a hassle,” Bruce said. “It takes more time for hand weeding to have a clean harvest.”

Farms also use it to combat soil fungi, for example, in the spring before planting summer tomatoes to get ahead of com-

mon diseases. They’ve also used it to sanitize greenhouse trays, pots, and distribution containers. One farm filled a box truck with seedling trays on pallets and funneled in steam to circulate around and sanitize the trays, Bruce said.

Most of the scheduling is handled through the conservation district using google calendar, and it’s moved from farm to farm on a trailer. Several dozen farms have used it since it first became available. They pay \$100 per tunnel to rent the steamer. It takes roughly 15 hours to steam the soil in a 96 foot by 30 foot tunnel and about 50 gallons of diesel, Bruce said.

The conservation district requests that all its equipment comes back in good shape to avoid a fee. “We ask that all farmers clean rented equipment of any materials, remove mud from disks, wash equipment, and wax prior to returning the equipment. Equipment that is not returned based on this requirement, is subject to a \$100 cleaning fee.”

Bruce isn’t paid to host the soil steamer, but gets first dibs on using it. It’s important to have someone keeping track of all the moving parts: the hose that moves the steam, the steam sock, the tarp, the chains and other pieces. The steam sock has to be cleaned, and they’ve had to replace and repair a few parts. He stores the generator under cover so it stays dry.

Having this specialized equipment shared across the region has been valuable. “It’s a good example of win-win opportunities for those of us involved in farming,” Bruce said.

The Cheshire County Conservation District equipment rental site offers instructional and demonstration video links on soil steaming at tinyurl.com/2sw4bx4k.

John Bliss at Broadturn Farm in Scarborough, Maine, had the same impulse, to create an equipment sharing co-op to bring a soil steamer to his flower-filled high tunnels and to other farms in the region to deal with weeds and diseases in tunnels. So far, there has been mixed success.

John got four neighboring farms to agree to participate in the co-op. He successfully applied for a Specialty Crop Block Grant through the Cumberland County Soil & Water Conservation District for a soil steamer and accessories that came to \$36,787. The plan was for the conservation district to rent the equipment to the co-op farmers and within about five years with the initial investment paid off, the co-op would own the soil steamer outright.

A little over three years in, that plan has not panned out. The costs were still too high for what was a fairly unfamiliar process. “Perhaps not everyone was drowning in chickweed like we were,” John said. Co-op membership was \$250.

Broadturn, the host farm for the soil steamer, and other co-op members pay a rental fee of \$300, plus the fuel and labor costs, estimated at another \$300, to sterilize soil in a 100-foot by 30-foot house. “We did steam super deep, about 4 inches,” John said. “Every inch of depth uses a lot more fuel and a lot of energy, but steaming allows us to get rid of weed seeds and disease, so it seems like a small price to pay for a fresh start.”

Once the soil steamer is paid off, John anticipates lowering the fee. The fees go straight to the conservation district and maintenance or parts come from that money that has been paid in.

Now, there are three solid co-op members and other farms farther away are using the soil steamer. The initial plan has been evolving. “We’re going to open it up more widely for others to join the co-op,” John said.

The takeaway for John: “It’s really important to have buy-in with co-op members before you start accumulating equipment. Expensive machinery is fine, but it should probably be not so experimental.”

Kootenay Local Agricultural Society in British Columbia

A group farmers in the Columbia River basin joined forces to create the Kootenay Local Agricultural Society (KLAS) in 2008. They created a local certification, Kootenay Mountain Grown, but then a provincial law made it obsolete by specifying organic certification. Yet, the society has benefitted area farmers in other ways, not the least of which is a tool and equipment sharing program spread across the large mountainous and landlocked region.

The geography makes it difficult to access food, so 95 percent is trucked in. That makes local food production vital, but also difficult. So pooling resources for tools and equipment keeps expenses for individual farms down, said Matthew Carr, current president of KLAS who owns Linden Lane Farms, which produces 10 acres of diversified vegetables and fruits, and Cultivate Horticulture, which manufactures greenhouse kits for farmers and backyard growers and distributes innovative farm tools and equipment.

Central to the KLAS tool library is a fleet of BCS equip-

ment: Tractors, tillers, power harrows, rotary plows, seed spreaders, brush mowers and chippers are available to rent by KLAS members, who pay a \$25 annual fee to join along with \$30 each year toward maintenance. Members then pay \$40 a day to use the tractor and an additional \$40 for attachments. The original equipment investment came from grants from the Columbia Basin Trust, which distributes profits from damming the watershed. The trust continues to support and subsidize the cost of the equipment sharing.

They added the flail mowers and power harrows last year as more people were asking for them for cover cropping and practices with less soil disturbance.

The equipment is held at three hubs: Creston, Krestova, and Kaslo with Creston the most central and busiest. Matthew’s farm is the equipment host site in Creston. They recently built a shed to protect the equipment in winter. “We’ve got people who will travel two hours away and pool with other farmers,” Matthew said. KLAS also has three trailers for moving the equipment around.

Informally, the farmers in the region also help each other out by consolidating orders, for instance. “If someone is going to Vancouver they let people know they are going to a supplier to see if anyone needs anything,” Matthew said. “I’ve had farmers pick up things for me when driving by a place. If you’ve got a broken tractor, it’s a two hour drive. That’s how isolated we are.”

Matthews father, Nigel, is the Tool Guardian who oversees maintenance of the fleet and is a stickler for how members use

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and handle the equipment. It's important to bring equipment back clean because some farms are organic, others not. Renters have burnt out the oil, clogged the engine or made a bad repair, such as dealing with broken rotary plow rototiller tines by welding them on backwards (instead of bolting them correctly). Replacing parts can take weeks and take equipment out of use.

"That's the hardest part of renting," Matthew said. "Every farmer thinks they can fix it if they break it."

Such mishaps don't happen as often as they used to. "My dad can be scary to renters, he's serious and explains what happens," Matthew said. They host equipment events on their farm to demonstrate general maintenance, such as changing the oil.

The budget for the tool library is tight. They're looking at a more sophisticated equipment booking system and for now

are using their website and emails. Originally they were cash based, but now accept online payments.

In the future, they would like to access more grants to expand the number of equipment hubs and reach more towns. Matthew, now 29, started his farm during high school on 3/4 an acre, and he rented one of the BCS tractors, which transformed how he farmed. "This program is great, young farmers can get involved no matter the size and scale and test out the equipment."

Jane Tanner grew cut flowers and specialty crops at Windcrest Farm and Commonwealth Farms in North Carolina, and helped manage the biodynamic gardens at Spikenard Farm in Virginia.



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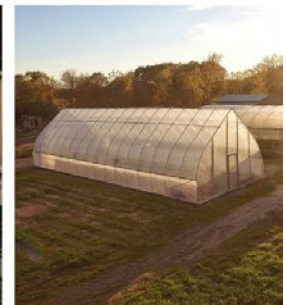
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