‘Lean’ principles applied to a farm

By Ben Hartman

The first few years of any farm are chaotic. They’re filled with high-energy experimentation. Farmers are learning their land, trying out different tools and production methods, and planting everything under the sun to see what grows well and what sells. Tractors are bought, greenhouses and coolers are built, workdays are long, vacations short.

At some point, the chaos needs to settle down if new farms and their farmers are going to survive.

A few years ago, Steve Brenneman, one of our CSA customers who owns an aluminum trailer manufacturing company, sent me an email offering to come out to our farm, watch us work, and then help us design a plan to “lean up” our farm. Steve is a good businessman and he is also a lean practitioner and teacher.

I wasn’t so sure. Lean principles grew out of the Japanese automobile industry (Toyota in particular is often looked to as a model). The basic goal is to ruthlessly eliminate waste—anything the customer does not value—from your production system.

Did a farm really have something to learn from manufacturing? Running an assembly line is nothing like the messy, unpredictable work of a farmer.

We decided to give it a try. We toured Steve’s factory and read up on the basic concepts. Steve came out and helped us develop a plan, and we got to work eliminating waste and re-organizing our farm.

We are by no means experts in “lean,” but our farm after two years of “leaning” is a very different place from what it was in the beginning, and some of what we learned might be helpful for other farms, too.

Below is a sampling of principles from lean thinkers that we found most helpful for us. Put together, they can provide a powerful toolkit for your farm.

1. Implement 5S

We started the lean journey by implementing the 5S system, a workplace organization method. Each practice corresponds to a list of five Japanese words which when translated all start with the letter s.

In a nutshell:

SORT. Get rid of anything that is not absolutely necessary for your production and keep only what you need.

When in doubt, get rid of it.
Letter points out errors on cross-pollination

I was very excited to receive the most recent issue of GFM a few days ago. This excitement was replaced by dismay when I found, for the second issue in a row, inaccurate information about cross-pollination for vegetable crops. The articles, both written by Pam Dawling, are about growing parsnips (March issue), and fennel (April issue).

The article “Parsnips are Easy to Grow and Reliable” lists parsnips as something that readily crosses with carrots and Queen Anne’s Lace. This is not true - parsnips and carrots are not only different species, but are different genera. It is quite difficult (perhaps even impossible) for carrots and parsnips to cross pollinate each other. Ms. Dawling was right, however, to note that carrots and Queen Anne’s lace will cross, as will parsnips with wild parsnips, as our cultivated varieties are the same species as their wild counterparts.

In April’s article “Growing Fennel - Bulb, Herb, Pollen,” Ms. Dawling asserts that fennel will cross pollinate with dill, carrots, Queen Anne’s lace, parsnips, and cilantro. While these plants are all in the same family, each of them represents a different genus (except the carrot/Queen Anne’s lace, as previously mentioned), and crossing is probably impossible.

If there are going to be more articles about vegetables in upcoming issues of Growing for Market, please make sure the information about species compatibility is accurate. Perhaps she or one of your editors could reference John Navazio’s new book, The Organic Seed Grower, which I see is offered for sale by GFM.

Thanks in advance for stopping the spread of this misinformation.

Sarah Kleeger
Open Oak Farm
Sweet Home, Oregon

Pam Dawling responds: On parsnips, the facts are that parsnips can cross with wild parsnip, but not with carrots or Queen Anne’s Lace, as I wrongly claimed.

On fennel, the facts are that fennel does not cross with anything except other fennel. It is widely said (even by some seed companies!) that dill and fennel cross, and some even describe the terrible flavor of the resulting crosses. Clearly this is a superstitious belief that continues because acting on the belief produces good fennel (or dill) seed. Similar to how someone might snap their fingers to keep away tigers - no tigers - complete success! I’ve long believed dill and fennel crossed. It’s good to know I don’t need to worry about that any more.

I apologize for my mistakes and appreciate Sarah Kleeger taking the time to set the record straight.
Lean up your farm
continued from page 1

For us, this meant spending several weeks loading up wagonloads for the auction or landfill.

SET IN ORDER. Every tool should have a place. At any given time, it should either be in its place or in the hands of a worker. There is no third option!

Our goal was to organize our spaces so that a 10-year-old could walk into a room and get us any tool we asked for. So tools are hung at as close to eye level as possible and they are not stacked on top of each other.

Another goal is to place tools as close as possible to where they are used. When Steve asked me to show him how I prune the tomatoes, I had to start by walking 200 or so steps to the storage barn for the pruners, then another 200 steps back to the greenhouse.

“Why not keep pruners in the greenhouse next to the tomatoes?” Steve asked. The thought never occurred to us.

Messes still happen, tools still get lost, sometimes for days at a time. But it helps to have organizing principles in mind.

SHINE. Clean your workspaces with a toothbrush. Then make sure they are well lit.

For us, we painted the cement floor of our processing room with epoxy paint so that we can mop up easily and we put in place stainless steel counters and sinks. Then we installed four T8 florescent light fixtures in our 12’ x 30’ processing room. It might seem like overkill, but we feel like the increased quality of our work was worth the expense.

We also bought and placed around the property several green-colored totes that are used exclusively for collecting weeds. The system is easy to follow and having totes close to where the weeds are encourages us to keep our growing beds clean.

STANDARDIZE. This refers to creating work stations that are identical for a particular job.

For us, we replaced our mix of 30 or so salvaged harvest containers of different colors and shapes with just one type of container. Another example: we supplied each greenhouse and each plot we farm with the exact same hose and irrigation set-up, so that a worker can water different areas without confusion.

SUSTAIN. Setting up organization systems is one thing, making sure you use them is another.

In some lean factories, a worker is assigned at the end of each week to go around the facility with a clipboard and give a numerical rating for the cleanliness of work spaces. The goal is get a better rating each week.

We haven’t gone that far, but we do set aside time each fall to deep clean our spaces. We call it “taking it to zero,” meaning we want each space to start the year with a cleanliness baseline of zero.

We also set aside a few hours of staff time on Friday afternoons to get the farm back in order. Doesn’t always happen, but we’re getting better, and, once again, it helps to have a target.

2. Find metrics to measure your work

To lean up, a farm needs to find and use consistent metrics to track which crops and practices are making you money and which are a drain on your resources (i.e., targets for elimination).

Chris Blandchard’s article in GFM January 2013 provides a great overview of how to track your costs of production, and I suggest reading it.

In addition to a careful income/expense analysis (your task as an owner), a “lean” practice is to pick one very simple metric that workers can use across all of your products that will allow your team to easily compare products and set goals.

For example, you could track the dollar value per harvest container for each of your different crops. Or the value per row foot. Or the value amount of each crop you can...
Lean up your farm
continued from page 3

harvest in an hour. The actual metric you choose doesn’t matter as much as making sure you’re consistent across the board.

You can often do this measuring in your head in just a few seconds as you are working. Post a chart in your processing room to keep track, then set targets for improvement.

3. Spend time deciding what NOT to do

After you have information on the profit margins for your crops, begin eliminating crops that track low. This is surprisingly hard to do! “But we have to grow X!” you might say. You can grow X, but realize that X might be bogging down your farm.

It helps to set a bar. For example, on our farm, we try to eliminate crops that do not yield a harvest of a set dollar value per hour spent harvesting and processing—what I call “field to cooler” time. (We double the bar for “stake and prune” crops like heirloom tomatoes and greenhouse peppers that take a lot of upfront time to trellis and prune.)

Sometimes the metrics will help you decide on equipment purchases. For example, potatoes did not make the cut for us until we started using a simple tractor-mounted potato digger.

The list of crops that don’t succeed will look different on every farm because every farmer has unique competencies and all farms have different soil types, equipment and market access.

4. Work as hard to trim expenses as you do to increase sales

Say your goal is to increase net profits by 50% over 10 years. What business wouldn’t love to do that!

One way to get there would be to expand production and increase sales. That approach would take a lot of effort: you’d need new equipment, more land, more greenhouses, more staff, more customers, etc.

Another way would be to cut expenses. What if you managed to cut expenses by just 5% a year (who couldn’t do that?) over a 10 year period while keeping revenues the same? This is lean growth.

Granted, the above example is simplistic. Revenue streams are important and there might be ways to efficiently increase those streams. Lean thinking simply encourages finding and eliminating waste as an equally legitimate way to grow your business.

Every year we examine a printout of our expense ledger and ask ourselves, “How can we trim another 5% off this year?” It’s a good discipline and it has helped to have a specific goal.

We love expense-cutting growth because the savings...
are perennial. For example, if you can save $500 per year on a cheaper compost sourced from another supplier, over 10 years you have saved $5,000. (Friends of ours who raise pigs have done these sorts of projections comparing different feed sources—whey, scraps, corn, etc.) Or if you can find a way to shave an average of just 20 minutes per day off your processing time because of a new method, over ten years (assuming a 5-day workweek) you will have freed up 52,000 minutes—or 36 days—to grow more food...or take a vacation!

5. **Create a smooth work flow**

Steve asked us to imagine we were watching our farm from overhead and to trace a line on paper whenever people moved around. By the end of a typical harvest day, our farm would look like a plate of spaghetti (hence the term “spaghetti diagram”).

To smooth out our spaghetti noodles, Steve encouraged us to harvest as “market ready” as possible.

To get from your field into the hands of a customer, a vegetable will go through a lot of “moves.” If you can find a way to eliminate even one or two moves, your noodle gets straighter.

For us, we have started harvesting our crops into the same totes that we will take to market (unless the crop needs to be washed), and we bunch or pack in the field as we harvest. For example, if we need 50 bunches of kale, we’ll count out 50 rubber bands, stretch them around a couple of fingers, and band as we pick.

6. **“Level the load”**

This refers to spreading out your weekly and yearly workload so that you are not overwhelmed during your peak times/seasons (Fridays/mid-summer).

We do this in several ways. We do as much spring bed preparation in the late fall as possible because spring is always a rush. We harvest throughout the week rather than waiting for the last minute. And we keep a winter project list of tasks to complete in order to free up time in summer.

Perhaps most significantly, we extend our growing season year-round through the use of greenhouses, so that our sales and workload are spread more evenly throughout the year.

7. **Remember who you are working for: the customer**

This is key. According to lean thinking, what the customer wants is paramount. It should dictate your long-term decisions and your day-to-day tasks. If your immediate task is not in the service of giving your customer something they value, then you should stop doing it.

This sounds harsh, but it is not meant to strip the fun...
out of farming. Rather, it’s meant to give your farm focus so that it is profitable enough for you to pay yourself fairly and to give you time to do things that you enjoy.

Sometimes customer-focused farming means going out of your way. For example, we have started calling some of our chefs (at a time they choose) so they can place quick orders while flipping eggs or plating a dish. This is faster for them than email (which would be our preference); as such, the phone call becomes part of the service we provide.

In conclusion, if your farm, like ours, has seen its share of chaos, then applying “lean” principles could help it run more smoothly and profitably. You probably started growing for markets because you envisioned making a living outdoors around the green things that you love. “Lean up” might help bring that goal closer to within your reach.

Ben Hartman and Rachel Hershberger own Clay Bottom Farm near Goshen, Indiana. They have a CSA and sell at the Goshen Farmers Market.
Increasing tomato yield

By Andrew Mefferd

In the March issue of GFM, I talked about a spacing change in my tomato hoophouse, which allowed me to plant 60 percent more plants than the previous year. Yet I was able to increase yield by 100 percent over the previous year. Now, I’m going to report on the improvements that led to the other 40 percent of my yield increase. Many of the principles can be applied to the field as well as the hoophouse, and crops besides tomatoes.

Learning from yield data

One of the biggest changes I made between the 2011 and 2012 growing seasons, besides increasing planting density, was to eliminate a few varieties that did not perform well for me in 2011. I got rid of the underperforming varieties and played with a tomato all-star team in 2012. The only way for you to figure out who your all-stars are is to do what any coach would do — keep statistics. Then make the time to analyze them once the season is over.

This doesn’t have to be a time-consuming endeavor. What we do on One Drop Farm is to repurpose our springtime plant propagation house (a 12’ by 20’ double wall polycarbonate lean-to off our garage) into the summertime tomato packing house. We throw a white tarp over the structure so it is still light inside when the sun is out, but the heat doesn’t build up as it does when it’s in greenhouse mode.

A ventilation fan runs constantly during the daytime to keep air flowing over the tomatoes, to dry out any moisture and reduce post-harvest rot. As tomatoes are picked and brought into the tomato packing house, they are weighed in and noted on a pad that lives right next to the scale. At the end of the season, we put all the numbers into an Excel spreadsheet set to auto sum and we can see how each variety did for us.

The differences can be significant and surprising. In 2011, I grew a bunch of different heirlooms (all of them grafted), and some of them did much better than others. So I eliminated the under-performers, and landed on four varieties that seemed to work the best for me: German Johnson, Cherokee Purple, Striped German, and Valencia.

Last year, I noticed something about Valencia that I had seen the previous year, but worse this time. The plants got excessively vegetative early in the season. Essentially, they were putting all their energy into vines and leaves and not putting much into flowers and fruit. The vines were as big around as the fat part of my thumb, and the new growth was so curled and twisted, it looked like herbicide damage! At the end of the season, I could look back at my yield data and see that that excessively vegetative condition cost me earliness and yield.

Now, this excessively vegetative condition is a combination of the plant being young and naturally vegetative, and being grafted to a vigorous rootstock. This is significant for Valencia because none of the other three grafted heirlooms I was growing reacted as vegetatively. Being convinced of the benefits of grafting as I am, I’m not going to stop grafting, but I am going to drop Valencia and try to find another orange tomato that performs better UNDER MY CONDITIONS.

BLUE RIBBON PLASTIC MULCH LAYER
MODEL # BR400

This layer comes with many options; like rolling dirt shields, side chisels and center fillers. Layer makes a 5” high bed in either 20” or 30” width depending upon if you use 3’ or 4’ plastic mulch. Bed shaper is lined with non-stick poly liner so less horse power is required. Powder coat paint finish. This machine was demonstrated locally with great reviews from customers.

In a single trip, make raised bed, lay drip line and cover with plastic mulch!
Horse power requirements; 20 hp 4 wheel drive or 30 2 wheel drive.

$2,300.00 with drip attachment
Distributed & sold by; MORGAN COUNTY SEEDS LLC
18761 Kelsay Rd
Barnett, MO 65011
Phone # 573-378-2655

Dealerships available.
Organic Certification?

No Sweat.

Now you can efficiently keep the detailed records required to be a certified producer of organic crops or livestock, without even breaking a sweat.

Developed by farmers for farmers, COG Pro makes collecting your agricultural data and generating reports for certification inspection a snap—right from your laptop, tablet or smart phone.

Visit www.cog-pro.com to find out more about COG Pro’s low cost, easy-to-use online notebook—try it out for free by logging in as a guest!

www.cog-pro.com

Increasing tomato yield
continued from page 7

I emphasize the last part because this is why the yield data is so important. It’s not that I think Valencia is a bad tomato. In fact, I think that for an orange tomato, it is remarkably uniform and unblemished, especially for an heirloom. But under my conditions it doesn’t perform the way that I would like it to, and I would rather fill the space with something that can be more productive.

If I didn’t graft or lived in another part of the country with different weather conditions it might perform differently for me. Getting the hot new variety or finding out what other growers in your area have success with may get you half the way to good production, but there’s no guarantee unless you take the yield data and verify for yourself that what you are doing under your conditions is working. Knowing which varieties produce best is worth way more than the time that it takes to get the data.

Your yield data may really surprise you. I know it surprised me this past winter to find out that I was only getting one third the yield off my grafted heirlooms than off my grafted hybrids. I was shocked! All the plants looked vigorous and healthy. You would never think the yield difference was that pronounced just by looking at them. It is always said that heirlooms are not as high yielding, besides not having the disease resistance of hybrids. I would have guessed maybe a half or so of the hybrid production but a third?! This is an example of something I never would have known if I didn’t have the data.

So, what does this mean to me? The way I think about it, my grafted hybrid beefsteaks yield about 30 pounds per leader, or since they’re double leader plants, 60 pounds per plant. I try never to take less than $2.50/pound for my red beefsteaks, and we sell a significant amount of them for more than that at the farmers market, so a grafted two leader hybrid beefsteak tomato plant is worth at least $150 gross to me.

The heirlooms, on the other hand are yielding closer to 10 pounds per leader or 20 pounds per plant. I didn’t sell any heirlooms for less than $3/pound, and sold a significant amount for more at the farmers market, so I can say that a grafted two-leader heirloom plant is worth at least $60 dollars to me. But even that doesn’t tell the whole story. It probably takes me twice as long to maintain a row of heirlooms as it does a row of hybrids. This isn’t a coincidence; greenhouse hybrids are bred to be lower maintenance. The opposite of this are the heirlooms, which have more double heads, dead heads, excessively large flower clusters, and generally weird and unruly growth habits that make them interesting to work on but time consuming.

In case you’re wondering about the raw data, I averaged 31.44 pounds per leader off my hybrid beefsteak plants, which were Rebelski grafted onto Colosus. On the heirlooms, which were all grafted onto Maxifort, I averaged 10.25 pounds per leader from German Johnson, 9.84 pounds per leader from Cherokee Purple, 9.7 pounds...
from Striped German, and 7.25 pounds from Valencia. Due to their excessively vegetative condition, the Valencias were also more than two weeks later to start bearing than the other heirlooms. And I only count marketable yield, since I leave the unsalable tomatoes in the hoop-house to be picked up with the other plant debris. Though the hoop-house does such a good job of protecting the fruit from the elements, I would say that I pack out somewhere in the high 90 percent range of the fruit that I grow.

And why did I use Maxifort for the heirlooms and Colosus for the Rebelski? I botched my first round of grafting with the heirlooms and by the time I started over again, Colosus was sold out. Most heirlooms seem to germinate and emerge in a much less even manner than most of the hybrids, taking a week or more for them all to come up, whereas the hybrids seem to all germinate over the space of a few days. When you need perfectly matching stems for grafting success, it can be advantageous to start four times the number of heirlooms than you really need to plant. The seed is cheap, and that should give you enough to match to your rootstock variety, which is more expensive and you could overplant by only 20% (or more, depending on how good you are at grafting).

Whether it is “worth it” or not to grow heirlooms is up to the individual grower. I plan to continue growing them, though on paper it seems that I should consider doing otherwise. If I didn’t grow some I would miss them. Another consideration is that our top-quality early season heirlooms set us apart and give us something to offer to suppliers that might otherwise not do business with us because we are selling what everyone else is selling. Another thing I keep in mind is that not everyone wants to buy a red tomato and we would surely lose some farmers market customers if we only had reds.

I figure as long as we can get 4,000 pounds of tomatoes at $2.50/pound minimum price out of a 30 by 48 structure that probably cost less than $10,000 to build, we are making the cost of the structure back every summer season. To my mind, that seems like a pretty good return, even though some varieties are more profitable than others. And knowing what different varieties are producing for you is golden when it comes to figuring out whether to continue with a variety, or even switch to another crop altogether.

Leaf and cluster pruning

One other thing that probably helped out my yields last year was that I kept up on leaf and cluster pruning. By leaf pruning, I mean removing the leaves below the cluster of tomatoes that is ripening. This is important to do for several reasons. When the leaves are allowed to remain below the ripening cluster, it keeps the truss cooler and that makes the tomatoes ripen more slowly. So, taking them off can speed up the ripening process. Also, the cluster microclimate caused by leaf cover on all sides traps more moisture close to the ripening fruit. This increases the possibility of botrytis developing on the calyx or fruit, and russetting or micro-cracking, which is made worse by free moisture sitting on the surface of the fruit. I have found fruits that are in perfect condition except for some russetting where a leaf was touching the fruit and keeping the fruit wet. This is particularly a problem late in the season in an unheated hoop-house, when cold night temperatures cause a lot of condensation on everything including the fruit. The fall is really the only time of year that I pull fruit because of russetting.

The leaves below the fruit cluster are too shaded to contribute much to the plant, and as the oldest leaves they are the most prone to diseases. When you take them off it opens up a lot more air circulation at the bottom of the plants. Otherwise, this is an area that tends to stay cool and damp and build up diseases like botrytis that like those conditions. The best way to remove these leaves is to cut them off flush with the stem with an x-acto knife, or I have come to prefer an old-fashioned razor blade snapped in half lengthwise and inserted into a woodworking blade holder. Do not snap leaves off or in any manner leave a stub of petiole attached to the stem. Stubs are very prone to botrytis infection that can move into the stem and possibly kill the plant.

As far as cluster pruning goes, it helps the plant remain vigorous and keep fruit size up to thin the cluster back to the desired number of fruits. Every flower that becomes a fruit is essentially a growing point, not unlike a shoot, which makes a demand on the plant to put energy into developing the fruit. One of the ways that greenhouse hybrids are easier to maintain than heirlooms is that they

continued on the next page
produce a more reasonable number of blossoms than some heirlooms do. I have seen a large-fruited variety like Brandywine throw 15 or 20 blossoms in a cluster!

A variety like that with fruit size from a half pound to a pound is obviously not going to develop all those fruits and have a 10-20 pound truss! Help it out and cut it down to a more realistic number. Most people prune beefsteaks to 3-4 flowers, cluster tomatoes to 5-6 flowers, and cherry tomatoes very lightly or not at all. Cherries can be tricky because the number of fruits set varies so much by variety. But if you look at the plant and many of the clusters have undersized, undeveloped fruit that never ripen at the end, you could nip that number off the future clusters to save the plant from putting energy into fruits that are never going to develop.

This is also a way to influence fruit size. If you have a really large variety that you would like to be a little smaller, you could leave four flowers and you will get four, smaller fruit than if you had pruned to three. If you have a variety that is a little smaller than you would like it, you could prune to 3 fruits and the plant’s energy for that truss will only be divided in 3, resulting in slightly larger fruit.

When to actually do the pruning is another question. If fruit is setting really well, it is common to do the pruning early on with flowers before the fruit is set. This keeps the plant from putting any energy into flowers and fruit that you don’t want. On the other hand, sometimes fruit setting is poor and not every flower is turning into a fruit, due to excessively hot temperatures or inadequate pollination. In these instances it might be better to wait until the fruits have become the size of a small marble to thin, so you can see which ones will actually develop.

These last two techniques of leaf and cluster pruning probably require too much labor to make sense in the field. But they really do make a difference in the high-labor, high-yield environment of the hoophouse and greenhouse.

Andrew Mefferd and his wife, Ann, own One Drop Farm in Cornville, Maine. Andrew also is a trial technician for tomatoes at Johnny’s Selected Seeds research farm.

The author’s deleafing tool: A razor blade snapped in half in a woodworking blade holder.
Extending the harvest season for edamame

By Pam Dawling

Since I last wrote about edamame, soybeans that can be eaten as a fresh vegetable, interest in this crop has increased and there is now more information available. Here I focus on providing edamame for a long harvest period. For more basic details see the June 2007 Growing for Market, or my book, Sustainable Market Farming.

**Crop requirements**

Edamame is a fast-growing, easy-care plant that grows in wet or dry weather, in varying soil conditions, as long as the weather is warm. It is important to supply enough water during pod-fill. Soil pH of 6.0-6.5 is best. At 100 seeds/oz. average, a pound of seed will sow 250' at 2” spacing. Increasing spacing somewhat will induce more branching, and not reduce yield.

**Photoperiodism**

Catalogs list edamame varieties by “days to maturity” but this information is not truly accurate, because daylength is the critical factor for most varieties. Growers have reported confusion caused by the “days to maturity” numbers. The transition from vegetative to reproductive (flowering) phases of soybean growth can only occur when the daylength is short enough. It is a “short day” crop — flowering once the daylength has dropped below a certain amount. The length of darkness rather than the length of daylight is the actual trigger. Once the period of darkness is long enough, the plants begin flowering no matter how short or tall they are or how many leaves they have. Different varieties require different minimum lengths of darkness to start flowering.

For maximum yields, grow varieties adapted to your latitude. Northern states with short seasons will find that “early-maturing” varieties which flower and mature under a relatively long day (shorter night) are best adapted. “Early” varieties can flower while nights are quite short (mid-summer), while “later-maturing” varieties will continue vegetative growth until nights get longer (in the fall). The terms early, mid or late/full-season variety are relative — an adapted full-season variety for one area would not be a full-season variety if grown to the north or south. A variety would be considered late if grown further north, but an “early-maturity” variety if grown further south.

Soybean varieties are classified into 13 Maturity Groups (MGs) expressed as Roman numerals. Knowing which MGs are adapted for your latitude helps you choose which to plant.

**Maturity Groups**

Each variety is assigned to the Maturity Group where it will use most of the available frost-free growing season and mature before frost. The MG 000 varieties are the earliest in maturity and MG X varieties are the latest. Most of the US is within groups 0-VII. The groups are narrow strips across the US, with lower numbered groups in the north, higher numbers in the south. Varieties in each higher numbered MG require shorter days/longer nights to flower and ripen than those in lower numbered groups. Each higher group requires a slightly longer growing season. Virginia is in MG IV or V, depending which map I look at. Here is a link to one map:

http://www.ca.uky.edu/agc/pubs/agr/agr129/fff00074.gif

A thorough explanation of MGs is found in AGR-129 Soybean Production in Kentucky Part II: Seed Selection, Variety Selection and Fertilization: http://www.ca.uky.edu/agc/pubs/agr/agr129/agr129.htm

A variety can be grown 100 miles north or south of its zone fairly successfully, but not further away. The photoperiod response is also influenced by temperature. When a high MG variety (adapted to a southern latitude with shorter days/longer nights) is grown in the north, the longer daylengths (and cooler temperatures) keep it growing vegetatively for longer, resulting in a very tall plant, a later harvest, and the risk that pods may not mature before frost. If a var...
Edamame
continued from page 11

Variety adapted to a northern latitude is grown too far south (with shorter daylengths and warmer temperatures), it will stop vegetative growth and switch to flowering early, meaning smaller plants and reduced yields. (More vegetative growth means a higher potential yield.) If you prefer a harvest sooner, even if it is not as big as it could be at another time of year, go ahead and try a lower MG variety. Low MG varieties can sometimes out-yield full-season ones because of high rainfall and other weather anomalies.

The University of Illinois has developed a series of “Gardensoy” varieties adapted to U.S. conditions, ranging from early maturing (MG 0) to late (MG V). See the National Soybean Research Laboratory Edamame and “Gardensoy” which includes a map of MG regions (for mature dry commodity soybeans): nsrl.illinois.edu/general/edamame.html. The publication includes a link to contact Theresa Herman for a free sample of 30-50 seeds of several Gardensoy varieties to test and report back on. Each Gardensoy variety is numbered according to its appropriate MG.

In 2006, Patricia Stansbury in Virginia tested eight varieties of edamame, four of which were developed at Virginia State University - Asmara, Owens, Randolph and VS03-688. Three commercial varieties, Kanrich, Butterbeans and Envy, and a Japanese variety named Akiyoshi were also evaluated. Asmara was voted the best flavor (“nutty and delicious”) with a prolific and long season. Owens was close behind it. Butterbeans ranked well for flavor but was lower yielding than Asmara and Owens. All 8 varieties were sown on May 2, at a soil temperature of 70°F. The low MG varieties, Butterbean and Envy, were harvested in mid-August, and the later varieties in late September. The trial was featured in the online magazine Common Ground: southernsare.org/Educational-Resources/Newsletters/Southern-SARE-Newsletters/Common-Ground-Spring-2007

and can be found on the SARE Project database. Search for project FS06-210.

There are also some daylength-neutral varieties, although the names are hard to find. Early Hakucho 65-75d is close to daylength-neutral. Sayamasume 85d is adapted to the north. Envy 72d is a variety that was bred for New Hampshire. In Mississippi, Besweet 2020, Butterbeans and Envy all flowered 29-34 days after planting (dap) and were all ready for harvest 58-64 dap, equivalent to traditional soybean MG late III-early IV. Elsewhere, Envy has been considered MGI or less.

For late-season plantings, use full-season varieties adapted for your area, not early varieties, as the nights will be getting longer by then. High MG varieties will be able to continue vegetative growth and have more potential for bigger yields.

In cooler climates, edamame can take considerably longer to reach maturity than the catalogs suggest. For example, in SW Washington, with 70% of the heat unit accumulation of the mid-west, crops took 40 days longer to reach maturity.

Soybean varieties also have different plant growth types. Generally,
Season extension in spring

Edamame may be transplanted, and this makes growing the crop possible in areas with a shorter season. In Kentucky, researchers are working to extend harvest of fresh edamame from July 1 to October 31. They start edamame in greenhouses for field transplanting. Tobacco transplanting machines have been used successfully in Kentucky in a 2001 trial.

Edamame can be grown in a hoophouse earlier and later than outdoors. Preliminary studies at Virginia State University found that edamame planted in the ground in high tunnels in April can be harvested in late June, two and a half months earlier than the earliest field-sown (Virginia adapted) edamame varieties.

The excellent Production System for Extending the Harvest Time Frame of Fresh-Market Edamame in Kentucky (uky.edu/Ag/NewCrops/edamame.pdf) has information on transplanting for earlier harvest, continued on the next page.

varieties in Maturity Groups 00 - IV are indeterminate: vegetative growth continues for several weeks after flowering starts. But Envy MGIII is only 2' tall. Most southern varieties (Maturity Groups V – VIII) are indeterminate: flowering does not start until most of the vegetative growth has stopped. There is also a semi-determinate type which is between the two main types in both appearance and growth habit.

Sowing

Make a first sowing in a sunny location, just after the average last frost date, perhaps 7-10 days later than your first bush bean sowing date. Ideal soil temperature is 65°F at 2” depth, but definitely above 55°F, with air temperatures around 68°F. A phenology sign is apple trees in full bloom, starting to shed petals. Sow 1-1.5” deep, (less in cooler or wetter soils), with about 2-3” between seeds, and 6-24” between rows. Do not soak the beans prior to sowing, or overwater after sowing, as they will be more likely to rot. If you have not had many soybeans growing on your land in the past, use soybean inoculant, which is not the same as general purpose pea and bean inoculant. Don’t plant seed beyond the season after the one the seed was produced in, as the germination rate drops rapidly.

Where the seasons are long enough, edamame can be grown as a summer “catch crop” on a bed following a spring crop, and before a fall crop. A benefit of growing edamame is the nitrogen added to the soil by the root nodule bacteria, as much as 1 pound of nitrogen for each bushel of harvested pods (soybeans are only a moderate nitrogen-fixer, compared to alfalfa).

Planting several varieties from different neighboring MGs (or varieties within your home MG with differing days to maturity) on the same day can be used to spread the harvest period. It also spreads the weather and disease risks.
Continuous planting for summer production, low tunnels and high tunnels. Varieties of four different MGs transplanted on the same date gave a longer harvest period than a single variety transplanted on three different dates. Harvest of four varieties from one date spanned 18-46 days, while harvest of a single variety planted three times spanned only 14-18 days. The four varieties planted on three dates gave a total harvest period of 37 days the first year, 75 days the second year (when the planting dates started later and the spring was warmer). The study recommended transplants for early production (with row covers for the earliest plantings), no artificial light and, at their latitude, sticking to MG II, III and IV, not MGI. Start planting out as soon after April 1 as convenient, and continuing succession transplants with MG III and IV until early-mid May. This schedule provides harvests 6/1-8/15, after which direct-seeded crops may be harvested.

Succession planting

As with spring transplants, a long harvest season can be provided most reliably by sowing varieties from different MGs on a single sowing date. Until more accurate information on MGs and local experience is available, “trying-and-seeing” is necessary.

The Kentucky study notes that plantings from early May to mid-June produces the biggest yields, and later sowings have lower harvests. They sowed four varieties (MGs I-IV) six times, 14 days between sowings. The total harvest period lasted from approximately 8/12 to 10/4. Later planting dates gave narrower harvest windows, due to shorter daylength. The gaps between harvests varied even though the gaps between sowings were equal. They also found that July sowings yielded considerably less than May sowings for all varieties. Their recommendations are to direct sow on May 1, two varieties, one MGI or MGII, the other MGIII or MGIV. Then sow a MGIII or MGIV every 14 days till mid-July. This should result in a harvest every 7-10 days from mid-August to early October. If you really like an MGI or MGII variety, you could sow that every two weeks after the initial sowing, but the number of days between harvests will be variable.

For us in central Virginia, at a very similar latitude to Kentucky, outdoor sowings are possible from April 26 (with row cover), to mid-July (about 90 days before the average first frost date). We grow Envy, which takes about 77 days to mature from our first sowing, 72 days later in the season and more like 90 days with the July sowings. We sow 4/26, 5/14, 5/31, 6/16, 7/1 and 7/14. The gaps between sowings are 18 days, 17, 16, 15 and 13 days. Figuring the best succession dates is still a work in progress for us. We find that 50’ double rows of Envy provide enough for a

Edamame
continued from page 13
couple of servings each for a hundred people.

Summer and fall

Edamame can be a good crop for the hoophouse in late summer in the south, and provides a rotation away from the usual nightshades, lettuce, spinach and brassicas. We grow Envy in our hoophouse in summer as a seed crop. Soybean seed is easy to save: expect about 1 lb/10'. Our hoophouse sowing (6/2-7/23) needs 110-120 days to reach the dry seed stage. We sow after early summer squash or cucumbers, harvest in late October or early November (ripening does slow down some in cooler weather). We have followed edamame with a sowing of bulb onions for outdoor transplanting the following spring, or greens transplanted on 10/30.

The same hard-working Kentucky researchers used hoophouses to grow fall crops of edamame, because low temperatures outdoors limit the rate of growth and frosts kill the crop. Using similar varieties as in their earlier trials, they sowed on 7/27 one year and 7/29 and 8/12 the next. The temporary hooped structures, with 6 mil plastic, were put over the already growing plants in late September. Harvest began 10/21 and lasted 4 days (for all 4 varieties). This was only two days earlier than unprotected plants, but the yield was significantly higher. The MGII variety yielded the most. Their recommendation is to look at whether the price you can get for late season edamame makes the cost of a hoophouse worthwhile. Outdoor sowings up till mid-August can extend the harvest until the end of October, but the chance of frost needs to be factored in. Of course, you will also need to compare this with other possible crops, if you already have a hoophouse.

Harvest and postharvest

Pods are ready when the beans are big, almost touching within the pod, and the hairy pods are still bright green. The exact color of the pods does seem to vary between varieties, and is somewhat a matter of personal taste. As the beans age the flavor becomes more starchy, less sweet and nutty, so don’t wait too long! Edamame beans reach maximum sweetness a month after flowering. For manual harvesting, one pound of marketable pods per three feet of row is a reasonable expectation.

The optimum harvest window is only about five days. Usually a single harvest is the most efficient method. If the weather is hot, pull the plants and retire to the shade to pull the pods off the stems. Some pods will inevitably be immature, but most will be ready at once.

Selling the whole plant requires the least amount of time and labor: clip the leafy top part of the plant off and sell the plants with the pods continued on the next page
attached, in bunches of four to six plants. When pods are kept on the stems, the crop maintains freshness and flavor. The beans retain high sugar levels for several days, and the quality remains at its peak.

You may want to clip the stems above soil level and leave the roots with their nitrogen-fixing bacteria in the soil. Some will scrape off and remain, even if you pull up the plants, which is quicker.

Edamame are not easily stored in pods for long. They need cool conditions with good air-flow to prevent molds growing. Washing, draining, and icing the beans before refrigerated storage in mesh bags is the method recommended in the University of Kentucky study. In Asia, the shelled beans are available as a frozen vegetable year-round.

**Marketing**

Several SARE projects have been researching edamame marketing. Go to http://mysare.org and search for Marketing Edamame Soybeans in Southeast Missouri and Marketing Edamame Soybeans in Kentucky.

**Pam Dawling** is the garden manager at Twin Oaks Community in central Virginia. Her book, Sustainable Market Farming: Intensive Vegetable Production on a Few Acres, is available at www.sustainablemarketfarming.com, or by mail order from Sustainable Market Farming, 138 Twin Oaks Road, Louisa, Virginia 23093. Enclose a check (made payable to Twin Oaks) for $40.45 including shipping. Pam’s blog is also on facebook.com/SustainableMarketFarming
A sensible approach to crop budgets

By Richard Wiswall

Truth be told, I don’t like record-keeping any more than the next farmer. You may think that is strange coming from someone who is known for advocating record-keeping repeatedly in workshops and in a book on farm business management. No, I didn’t get struck by lightning or have a brain transplant. I just want to put recordkeeping in its proper place and to stress the importance of the end result of any data collection: making a good living from the work I do on my farm.

I want to share a few thoughts that address some questions that crop up often when crafting a crop budget. In my workshops and book, I stress the need to record some pieces of information that will be used to create enterprise budgets. These enterprise budgets (carrots, blueberries, feeder pigs, dairy goats, laying hens, for example) are compared for relative profitability, and are at the heart of shining light on the farm’s undiscovered profit centers (and losers). These enterprise budgets are used for increasing your profitability; they will affect your farm’s other financial statements like the Balance Sheet, Profit and Loss, or Cash Flow Projection, but are separate tools.

A good enterprise budget requires taking some data during the farm work day or work week, oftentimes of labor tasks done for a particular farming venture. How many person hours did it take to weed 500 bed feet of carrots? How long does it take to pick 50 pounds of blueberries? How many bushes did it take per picking? The answers to these questions give a very accurate accounting of the expense side of the Profit = Income - Expenses equation for the different things you do on the farm. Labor expenses for harvesting and weeding, and yields and sales price often have the biggest impact on enterprise budgets; pay attention to these.

In the excitement of wanting to uncover their farm’s own profit centers, sometimes workshop attendees or readers of my book will, in all good intentions, record everything people do all day on the farm. While this may be useful, it can backfire. Too much information can be overwhelming, and actually may make it harder to make a cogent enterprise budget. Heads spin, crucial data is missing amidst pages of notes, arms go up in frustration, and the once exciting profit discovery process comes to a halt.

This is not the desired outcome. So… instead of recording everything everyone does all day, START SMALL.

Begin by recording information about your top 1-5 sellers. These crop and animal ventures, or enterprises, are the most important to analyze because they are bringing the most money into your farm checkbook. If you only grow a few bed feet of radishes each spring for a minimal amount of sales dollars, then don’t worry about them for now. Tackle the big sellers and make sure you are profitable (or can be made profitable) with them first.

Only record information for these top 1-5 sellers. Let’s say beets are a top seller. After I prep land and seed beets, I may not record anything related to these beets for three weeks (when I cultivate them). And then another week or two goes by before cultivating the beets again or hand weeding them. All my data for that crop of beets fits on one page of paper. To simplify the process, designate one person to gather and record the specific top selling crop or animal info (if it is not yourself).

Another big help and time saver is to record data efficiently by paying attention to rates: bed feet weeded per hour, bushels harvested per hour (or bed feet, or both). Two or three variables should always be written down. Once established, check rates for accuracy a few times a season. This way you don’t need to record often-repeated tasks, such as lettuce picking times on numerous succession plantings. Just check that the rate is on target. These rates can be used very effectively when creating enterprise budgets.

Practice with a budget

Enterprise budgets can be made in hindsight, using real numbers from the previous season, or they can be made using your best estimates for a future enterprise. Try making a projected budget for one of your farming ventures just to get a feel for the process. It will clearly show you what numbers are missing, and need verification, continued on the next page
fication in the future. You’ll be able to narrow your focus and jot down fewer, and more meaningful, notes. Practice this projected budget now; it will be very informative. I recently did one in a workshop in just 11 minutes. Set aside half an hour and I bet you’ll be pleased with the results. Try limiting yourself to the back of an envelope - that’s how simple it can be.

Making your first budget

The first one is always the hardest, but nonetheless very doable. You’ll need to start with two things.

First, determine the size of the enterprise (e.g. 1/4 acre of carrots, 100 meat birds, 2 feeder pigs, 21’ x 96’ hoop-house of spinach). Use the size that is most commonly undertaken. If you normally make 20 gallons of apple cider per batch, use that amount.

Second, determine an hourly rate for labor. Even though you may do all the work yourself, you still need to know how many hours were spent on the project and what that labor cost will be. We all share the fact that there are only 24 hours in a day, and some of that time is needed for sleeping, eating and personal time. The time you devote to work is a limited resource and your work hours should be spent in a useful way. Besides, if you break a leg or are called away to a family wedding or funeral, you’ll have to replace your labor, often by paying someone. The labor rate you determine (usually what hired hands are paid) gives the time spent on a crop or animal enterprise a quantifiable number for the expense side of the profitability equation.

(Note: if you make a profit on the enterprise, and perform all the labor yourself, you will keep not only the net profit amount, but also the amount of labor expensed in the budget).

Chronology

After determining the size of the enterprise and the labor rate ($/hour), start budgets by writing down the tasks of the enterprise in chronological order from beginning to end. With the beet example: prep soil (spread compost/fertilizer, disk in, chisel beds, form beds), seed beets, cultivate with tine weeder, cultivate with baskets, hand weed, irrigate if necessary, cultivate, harvest, pack out, post harvest field care (disk, seed cover crop).

You can then fill in the costs associated with each task (or do it as you write them down).

Use your recorded notes (and/or rates) and actual expenses from receipts (seed cost, bag cost) to calculate a cost for each task.

To keep it simple at first, you may want to postpone tackling marketing, delivering, and overhead costs. You will have a rough idea of profitability, and you can compare enterprises side-by-side pretty effectively.

Don’t get hung up on one item for too long. Forge ahead and revisit it later after more pieces are in place. Use your best estimates. For tractor or greenhouse expenses, refer to my book and its appendices as a shortcut. Or spend a little more time figuring true costs for your farm.

Putting it together

After you total your production expenses, calculate your sales revenue for the enterprise, breaking sales into differing price structures if necessary (more beets sold wholesale at a lower price per pound than at retail).

Subtract expenses from sales and presto! You have a net profit for the given size of your enterprise (without marketing, delivery and overhead expenses).

When looking at an enterprise budget, whether it is profitable or not, look at the big expense numbers first. These numbers have a great effect on the net profit. These big expense numbers (and all other expense numbers) may be able to be reduced (usually through efficiencies, sometimes by scale). Labor is often a big expense number, and budgets without labor expenses may even look profitable. But if you are willing to work for nothing, come work at my farm. Focus on using labor as efficiently as possible. For now, don’t sweat trying to bring down the smaller expense numbers, they will have the littlest effect on your
net profit.

The other major player in your net profit is the yield, and sales price of that yield. Sometimes a slight yield and/or sales price increase can dramatically improve net profit.

Now that you have created one enterprise budget, others will fall into place quickly.

**Overhead expenses**

The above enterprise budget covers production expenses and sales, and can be very useful in comparing the things you produce on your farm for relative profitability. I can almost guarantee that your enterprises won’t be the same profitability; some things will make more than others, sometimes way more. But certain real expenses are not covered in these budgets. They don’t address marketing, delivery, and overhead costs. These are real expenses, and the money to pay for these has to come from somewhere. If each farm product doesn’t help pay for these expenses, off-farm money will need to pay for them.

For simplicity, I’ll lump all overhead expenses (farm share of insurance, phone, electricity, website, land taxes, computer, landfill, office, conferences, advertising…) and marketing and delivery together. If that total is $10,000 per year, then each farm enterprise needs to contribute some of its net profit to the $10,000. How you allocate the overhead expenses is up to you; it could be by acre, by breed, by sales % of total sales. Just be fair, and cover the whole $10,000.

I hope these tips help you to overcome the natural inertia surrounding the analysis of farm finances. It doesn’t take that long, just set aside some time and do the math. It pays.

Richard Wiswall owns Cate Farm in Vermont and is the author of The Organic Farmer’s Business Handbook, shown at right.
Food safety: equipment & buildings

This is the second in a series looking more closely at the five areas of potential produce contamination identified by the FDA.

By Chris Blanchard

The first principle of microbiological food safety is to keep the poop — and the potentially nasty microbes it carries — off of the food in the first place. That means keeping tools, equipment, and facilities from being contaminated by feces from people and animals right from the start. And because poop inevitably does make its way onto our produce and into our packing environment, we need to take reasonable steps to ensure that our tools and equipment don’t spread that poop from one item or one place to another.

When exploring ways to produce microbiologically safe food, we’re always looking for ways to reduce risk, not eliminate it. Where organic farming is about following certain methodologies of agriculture, food safety is about accumulating risk reduction to produce a decreased likelihood of contamination by food-borne human pathogens. Because the kinds of buildings, equipment, and tools used on vegetable farms vary widely from operation to operation, changing significantly with the scale, diversity, and product mix of a given operation, the specific tools and tactics used will also change.

Equipment and tools

Whatever we’re using should be easy to inspect, maintain, clean, and sanitize. Cracks and crannies are bacteria’s best friend, because they hold water and provide snugly little hiding places. Tables should be smooth with good welds, and knife blades shouldn’t be loose in their handles.

Equipment that’s permanently placed should be accessible and easy to clean. Even shelving and pallets need to be considered as “equipment” if they come into contact with food or food-contact surfaces.

Equipment and tools should be stored in a way that avoids contamination by contact with rodents, birds, and insects. Ideally, knives and harvest totes would be stored in an enclosed facility. If you don’t have an enclosed facility, knives and other harvest tools could be stored in a lidded, solid-sided tote. If totes aren’t stored indoors, at least turn them upside down, elevate them off the ground, and put some sort of cover over them.

Even the smoothest surfaces, such as stainless steel, can still carry E Coli O157:H7 from one piece of produce to another, so cleaning and sanitizing are a first line of defense against introducing and spreading disease. First, rinse the surface to remove any free dirt and debris. Clay particles and organic matter bind up sanitizers and keep them from being active against microbes, so you’ve got to get those off of the surface you’re sanitizing. If dirt and debris of any sort remain — even a thin film — after you’ve rinsed with water, use elbow grease or a detergent to free up the remainder, and rinse again.

You have to rinse before applying a sanitizer, because detergents can inactivate sanitizers, just like clay and organic matter. Once you’ve sanitized, don’t rinse again — that just increases the opportunity for recontamination.

It’s the best practice to clean and sanitize all of your harvest and packing equipment at the end of every day, and to sanitize again before you use it again in the morning. Sanitizing clean tools can be as easy as dunking them in a bucket of sanitizer solution before you take them out to the field; the water that remains on them when you carry them to the field will be enough to provide an adequate contact time for the sanitizer to be effective.

You can use a variety of sanitizers, but make certain of two things: first, be certain that you are using a food grade sanitizer — no lemon Clorox here. Second, use the right concentration, which you will find on the label. Weak solutions aren’t effective, and solutions that are too strong can cause damage to the surface you’re sanitizing.

For a hard-surface sanitizers, I use Ecolab’s Oxonia Active, because the hydrogen peroxide and peroxyacetic acid blend breaks down into water, oxygen, and acetic acid, and it’s OMRI-approved for organic production. Peroxyacetic acid (also known as peracetic acid or PAA) gets dismissed in some circles as being relatively ineffective, but in combination with hydrogen peroxide it is very effective.

Keep in mind that harvest equipment isn’t just knives and totes — it also includes harvest vehicles and carts, which also need to be cleaned and maintained in such a way as to avoid contamination. That means that vehicles used to haul produce shouldn’t be used to haul trash or livestock, unless they are readily cleaned and sanitized — a caveat that would exclude many panel vans and garden carts. Pallets can reduce contact with potentially contaminated vehicle floors.

In the field, equipment should be operated in such a way as to avoid moving contaminated soil into fields where vegetables are grown. If you are doing both livestock chores and harvesting tasks with the same vehicle, do the harvesting work first, then move into the livestock field — and consider how you can reduce any contamination before you drive out to harvest the next morning.
Buildings

When we start talking about buildings, remember that food safety is about reducing risk, not about eliminating it. In the ideal food-safe world, everybody would be packing produce in state-of-the-art enclosed packing sheds, but not every farm operates at a scale that makes that feasible. So, we need to do what we can to create an environment that prevents contamination with food-borne illness organisms.

You should be able to clean all of the surfaces in your packing area: floors, ceilings, fixtures, and pipes. At Rock Spring Farm, we use a combination of fiberglass reinforced plastic (FRP, or dairy board) and painted tin on our walls and ceilings to make cleaning easy. Full-fixture shields can make lights easy to clean, as well as preventing physical contamination from broken glass.

Condensation and dripping should be avoided. Condensing water concentrates dust and provides a means for contaminating food, food-contact surfaces, and packing materials. Ceiling insulation can reduce or eliminate condensation and dripping in rooms at large; in walk-in coolers, functioning catch pans and drain piping can remove water from the cooling units without condensation.

Concrete makes cleaning floors easy, and facilitates adequate drainage. Packing on gravel, grass, or bare soil makes it almost impossible to remove all of the food waste from an area. Puddles serve as watering holes for pests like rodents and birds, and provide a breeding ground for organisms like Listeria monocytogenes, the organism implicated in last summer’s cantaloupe outbreak, so you’ll want to make certain that water flows away from your packing area. Concrete crews don’t always do the greatest job of pouring a flat and even slab, and a squeegee can help move water towards a floor drain if you’ve got uneven spots in the floor.

Packing areas can be enclosed in a variety of ways. I’ve seen successful farms with heavy-duty screening hanging from a lean-to shed, plastic sheeting nailed to poles, and hoop houses for packing facilities; you don’t have to build a sophisticated structure to keep dust, rain, and animals out.

Regardless of whether you have an enclosed packing area or a lean-to shed, you should make an effort to exclude as many animals as possible. Domestic animals provide a fertile vector for microbes – I’ve seen what my dog rolls in, and I don’t want that anywhere near my food. Rodents, insects, lizards, and birds can all carry pathogenic microbes, so you should make every effort to keep them away from packing operations and packaging materials.

Most efforts to keep animals out
of the packing area focus on physical exclusion – screens and doors to keep animals out of the packing facility. Some farms use discouragement as well, such as “scare eye” balloons of the sort used in orchards to discourage birds, and owl decoys to frighten rodents.

Exclusion means not only keeping pests out in the first place, but also not providing a welcome environment for them to stay. In a lean-to with open rafters, the addition of bird netting stapled to the underside of the rafters won’t keep birds from flying in, but it will deny them a place to build their nests and take up residence.

Pests that get in should be captured and either killed or removed. On my farm, we used the Mr. Sticky Fly Tape System in our old hoop-house packing shed to significantly reduce fly populations in the packing area; this skinny sticky tape ran across the top of our packing area, and could be wound up when it was full of dead, crunchy fly carcasses to expose fresh new sticky tape.

We monitor for rodent pests weekly using “tin cat” mouse traps with a window in the lid. We place one in each room of the packing house, including each cooler, with the open passage side butted up to the wall. Traps are checked weekly for signs of rodent activity. If we find evidence of rodents, we label the location as a “hot spot,” and check the location daily until we have ten days with no sign of activity. Shortly after we instituted this monitoring program, we expanded it to include our cover crop seed storage and our greenhouses, and greatly reduce rodent damage as a result.

Plumbing, litter, and waste

Anywhere you’re picking and packing vegetables, you’ve got waste. Trimmings and lunch scraps provide food for rodents and flies, and paper towels and sewage provide potential sources of produce contamination.

Toilet facilities should be located in locations such that they don’t contaminate packing areas, and should be designed so that they are easy to clean, with washable walls and floors and plenty of space around the stool. In my packing house, the bathroom opens onto the employee kitchen, rather than directly into the packing area.

Hand-wash facilities should be located appropriately. Some people recommend that hand-wash facilities be located outside of the bathroom, so that managers can monitor compliance with good hand-washing practices. In any case, they need to be accessible to workers during the transition from field to packing house, and before they do anything that involves handling food.

Waste water from hand-washing is considered contaminated, by definition; after all, you wash your hands because they might be contaminated, so it only makes sense that the water you use to wash them becomes contaminated as well – so it needs to be directed into a sewage system or into a container for later disposal, rather than being allowed to run into the field.

Litter and vegetable waste should be handled in such a way as to not harbor pests, and not to contaminate produce or food-contact surfaces. Lidded garbage cans for trash provide a clear place for litter, and prevent access by rodents or birds.

Designated containers should be used for vegetable waste. We spray-painted a red stripe on several of our plastic harvest totes to designate them as “compost” containers, and purchased several red buckets, as well; on my farm, red is the color for non-food-contact equipment, such as brushes used to clean the walls and brooms for cleaning floors.

In the packing shed at Rock Spring Farm, red means non-food contact. Red brushes for cleaning walls and floors are kept separate from the tools used on food contact surfaces, and totes for compostables have a red stripe.

Chris Blanchard owns and operates Rock Spring Farm in Northeast Iowa, which is food-safety certified. He offers education and consulting as Flying Rutabaga Works (www.flyingrutabagaworks.com) and is the co-author of Fearless Farm Finances, available from www.mosesorganic.org.
Learning from great designers

By Erin Benzakein

For the the life of our flower business, we’ve been hunkered down, pushing through, making do with little and solely working with what’s at hand. Limitation has always been the theme. The property we farm is not our own and is a small plot at that. We started with no money, little training and had to find a way for the flowers to turn a profit the first year and beyond. Don’t get me wrong, limitations can be a marvelous thing and we have learned an enormous amount by working around them! Limited resources = creative problem solving and through this process we’ve blown the doors off of what seemed possible both financially and production-wise per acre. But making do and going without is hard over time both on the physical body and morale. So 2013 is going to be different in the very best possible way! We’ve decided to finally start investing in ourselves, our education and to get a bigger view of the world surrounding flowers.

In March we flew to Texas to see the Arnoskys’ legendary farm and in April I jetted to Palm Springs and studied under one of the best floral designers in the industry, Kate Holt of Flower Wild. Next month I’m heading back to California for a three-day flower intensive at Chalk Hill Clematis with floral master Ariella Chezar. Then late this summer Brooklyn’s amazing floral artist Amy Merrick is coming out to joint teach a flower workshop at our farm. This fall Jennie Love and I are scheming on a growing/wedding class in Philadelphia. It’s an exciting year full of new ideas, skills, adventure, connections and a whole lot more wedding flower love!

Kate Holt, owner of Flower Wild and teacher of last month’s workshop in Palm Springs, has been on my radar for years. Her floral designs are fresh, abundant, garden-inspired and most of all seasonally based. It’s one thing to learn the mechanics of putting together a fancy bridal bouquet or centerpiece with standard material from the wholesaler but it’s a whole other ballgame to see an expert in the industry using the freshest seasonal ingredients and arranging them in a natural, loose, organic way. Pair this approach with gorgeous linens, killer props, an amazing venue and spectacular photos... it was pure heaven, I tell ya!

Spending two solid days surrounded by 15 floral designers from all over North America and hearing how they structure their businesses, find inspiration, market online, and struggle with the same fears and insecurities as I do was amazing! But probably the coolest thing that came up in our hours and hours of talking was how many of the designers want to find ways to connect with local growers and seasonal product moving forward. There were complaints about the limited availability, poor quality and lack of unusual ingredients through their wholesalers. Kate, our teacher, shared that the best designers in the country have cultivated close relationship with specialty growers and it shows in their work. The new trend emerging in the high-end floral world is one that is rooted in seasonal flowers that are relative to the place they are displayed and arranged in an abundant, natural way. Sitting in on this discussion was quite eye opening since I often feel a little ashamed or embarrassed that I grow most of the flowers that I use in wedding work. Hearing these designers longing for fresh blooms, grown in their own backyards or by a caring farmer was almost comical... I finally realized how good I really have it!

Another thing that stuck out in our conversation was the breakdown between the ingredients designers want and what’s being grown by local producers. While sunflowers, millet, gladiolas, asiatic lilies, amaranth and zinnias are all great crops, higher-end designers are leaning towards more delicate ingredients in more refined color palettes. Knowing what the florists will be requesting in the upcoming seasons take a little digging but if you can spot the trends early you’ll be set. I suggested that the designers seek out and meet with farmers during the winter months to map out what flowers, foliages and colors they will be wanting in the seasons ahead. While the concept of growers and designers teaming up and collaborating is relatively new, I do think there is a tremendous amount of promise. If growers knew what designers were wanting and designers got exposed to the enormous amount of choices in ingredients, it would be a win-win for everyone! Jennie Love from Love N’
Fresh Flowers and I have teamed up on a floral idea, called The Seasonal Bouquet Project. Every week we each create and photograph an arrangement using flowers grown within 50 miles of our farms. Our goal is to showcase what's possible with seasonal flowers and so far it's working out great! Many designers at the class were already following along and inspired by what they saw.

Next to grocery stores, I believe that flowers to event florists are going to be a hot sales spot in the future. Buffing up on work by good designers, the coming trends, popular colors (not what Pantone says!) and sought-after flowers is key. I personally frequent many wedding and floral design blogs every week, watching California and New York designers especially. Many cities are a few seasons delayed in style trends so keeping an eye on the horizon will give you time to plan and plant.

It was so heartening to hear such excitement about local product coming from the designers in the class. Just a few years ago there was an enormous gap between where flowers were grown, who grew them and who was using them in the end. Following the path that vegetables, meat, dairy and honey forged, local/responsibly produced flowers are finally catching on.

Getting off the farm and out into the world has been exciting beyond belief! While working inside such strict limitations these past years has really helped us hone our craft, master efficiency and squeeze more flowers than one can imagine from a tiny plot of land, I'm ready to see what's going on out in the flower world and help build a strong bridge between growers, designers and consumers.

I thought sharing a few of my favorite resources, links, and popular varieties might be helpful if you are interested in charting a course into the fancy wedding flower realm. Wedding blogs to follow: Snippet & Ink, Style Me Pretty, Green Wedding Shoes, Martha Stewart Weddings, Kiss the Groom and Jose Villa.

Designers to watch: Sarah at Saipua, Amy at Amy Merrick Flowers, Kate at Flower Wild, Ariella at Ariella Chezar Floral Design, Sarah at Honey of a Thousand Flowers, Emily at Emily Thompson Flowers, Susanne at The Blue Carrot, McKenzie at McKenzie Powell Designs.

Magazines to subscribe to: Martha Stewart Living, Martha Stewart Weddings, Flower, and your local Wedding mags (ours are Seattle Bride and Seattle Metropolitan Bride and Groom).

Colors that are super popular in wedding flowers right now: white, cream, blush, champagne, coral, peach, salmon and orange. Later in the season you'll see a big draw towards saturated fall tones, especially rust, bronze, deep red and orange.

Supplies for Small Growers

SEED STARTING - Pots Trays Inserts Plug Trays
Labels - large variety size, color & shape of blank plant pot & row markers
Weed control, fertilizer, tapes & ties, watering, and more.

Enter coupon code GFMMAY for a 15% discount for a limited time at AAAmercantile.com

http://www.amazon.com/shops/AAAmercantile
http://stores.ebay.com/AAA-Mercantile
Do you do wedding flowers?

If so, I invite you to be included in a new book to be published by GFM about using local flowers for weddings. The target audience will be prospective brides interested in sustainable flowers and/or DIY flowers. The goal is to encourage the use of local flowers by helping brides understand the seasonality, logistics, and economics of working directly with flower farmers.

The book will be published as an E-book, which provides an opportunity to link readers directly from the book to your website. If you grow flowers and sell to brides, we invite your participation in one of two ways:

1. If you do floral designs, we encourage you to submit a few photos of wedding florals you have done using your own flowers. You must own the rights to any photos you send — either you took them yourself and grant permission for their use, or you can obtain permission from the photographer. Email photos and permissions to lynn@growingformarket.com and put Wedding Flowers in the Subject line of your email. Include your name, farm/business name, location, website and other contact information.

2. If you don’t have photos, you can still get listed in a directory of local flower growers. Email us your farm name, location, and website or other contact information.

The deadline for inclusion is June 1. We will acknowledge all emails, so if you don’t get a response within three days, assume we did not receive your email and try again. We regret that we can’t accept photos or directory listings unless they are sent by email. — Lynn Byczynski
Grow Italian and taste the difference!

At left: Our customer John Sydor of Bainbridge Island, WA, sent this photo of his Supermarconi pole beans with the note “Up to 13 inches long and still tender.”

Request a catalog at www.growitalian.com or by phone 785-748-0959

Grow Italian and taste the difference!
Make sure you are using genuine Aza-Direct Botanical Insecticide in your insect control program.

**Multiple Modes:** Provides insect growth regulation, anti-feeding, repellency, and reproductive disruption

**Flexible & Friendly:** For use on organic and conventionally grown crops up to and including the day of harvest

**Broad Spectrum:** Activity on a wide range of pests including aphids, borers, true bugs, caterpillars, psyllids and thrips

**Highly Refined:** Formulated with minimal impurities to make the purest azadirachtin insecticide available

Aza-Direct is a registered trademark of Gowan Company, LLC. EPA Reg. No. 71988-1-10163.
Floral designers

continued from page 24

bet tones), dahlias (the dinner plate Café Au Lait is hot!!! Plus deep reds, oranges, corals, white and peach), berries (thornless blackberries and everbearing raspberries), Viburnum (‘Michael Dodge’, ‘Blue Muffin’ and Opulus cranberry), cosmos (white, seashells, chocolate), basil (purple and oriental), succulents, echinacea pods, yarrow (terracotta, cassis, summer berries, apple blossom), scented geraniums (chocolate and rose), vines (large flowered clematis, love in a puff, porcelain vine, cup n’ saucer), queen anne’s lace (black and Ammi majus), garden roses (cream, peach, coral, salmon, pink) and scabiosa (pods and flowers).

Fall: Mums (disbud and crazy spiders in fall tones), perilla (dark leafed), dusty miller (New Look), vines (bitter-sweet and porcelain), scented geranium (chocolate, rose, ginger), pods (nigella, scabiosa, poppy), grasses, rosehips, kale (redbor and winterbor), snowberries and hydrangeas.

Erin Benzakein owns Floret, a small organic flower farm in Washington’s beautiful Skagit Valley. You can follow her flower adventures on her blog: www.floretflowers.com/blog

Fritillaria persica, top, and the bridal bouquet Erin created, using an unfamiliar but interesting color palette of deep blues, purples and white. Bouquet included: lilacs, ranunculus, Fritillaria persica, Muscari, sweet peas, Viburnum ‘blue muffin’ berries and heather.