

At The Ground Level

Healthy Produce All Begins With Maintaining Healthy Soils

EDITOR'S NOTE: This is the first of a two-part series.

BY RITA BRHEL
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Across the nation, there is a huge demand for local, farm-fresh, organic fruits and vegetables but there is also a great gap in knowledge among producers as to how to grow quality food without the use of chemicals. When thought of, the image conjured in the mind is of a pest-ridden garden bearing little produce for the number of plants and the amount of work. Dan Kittredge, executive director of The Real Food Campaign at North Brookfield, Mass., wants to change this image of organic production — by educating producers on how to grow quality food, economically.

“As an organic farmer, I have watched many crops suffer pestilence and disease, and I have seen many poor yields through the years,” he said. “I’m not opposed to not growing organically; I just think it’s quite possible and plausible to grow organic well, that anyone can do it.”

What needs to change for frustrated organic producers is to focus less on the fact that organic means no chemicals and to look more at the whole picture: “The biological system will flourish if given the opportunity,” Kittredge said. “Minerals, soil life, organic matter, water, and air: These are the central components to any living system.”

On the flip side, consumers are seeking out organic produce because they are reportedly healthier. This doesn’t mean just being fresh, but that they contain higher amounts of nutrients than their grocery chain counterparts. And there is a strong connection between the health of a garden and the nutrient content of its produce, Kittredge said.

“The critical role of soil health is that it is central to a functional plant,” he said. In the average soil, all nutrients have dropped since the 1930s, some as much as 300 percent; consequently, the fruits and vegetables grown on these mineral-deficient soils contain less nutrition, too. “This correlates directly to degenerative disease [in humans],” he added.

FIRST STEP: SOIL TESTING

If nutrition of fruits and vegetables depends on plant nutrition, and plant nutrition depends on soil nutrition, organic producers need to refocus their efforts to improving soil health. And the first step is to determine the soil’s nutrient deficiencies. This means taking an annual soil test.

There are two types of soil tests available:

1. A strong acid soil test, which should be done in the fall, preferably at the end of September or in early October, after the growing season is done but before the cover crops are growing.
2. A weak acid soil test, which should be done four to six weeks after germination, in time to correct any deficiencies before the fruit is filling.

Kittredge recommends that producers begin with a strong acid soil test, to get an overall view of the soil and to learn what needs to be done to improve the soil for the long term.

“The strong acid soil test is like your savings account,” in that producers are learning what minerals are always present,” he said. “Your weak acid test is like your checking account.”

Here are the macronutrients to pay attention to for common deficiencies in organic gardens:

- Sulfur — Ideally, this level would be at 75 parts per million (ppm). Most soils are



PHOTO: RITA BRHEL

deficient, ranging from 15 to 25 ppm.

- Phosphorus — 75 ppm ideally, but is only available for plant use in all but Brassica like broccoli with the presence of functional mycorrhizal fungi in the soil.

- Calcium — 65 to 70 percent ideally.
- Magnesium — 12 to 16 percent ideally.
- Potassium — 3 to 5 percent ideally.

Not all labs test for the wide array of trace minerals, but this is one area of soil testing that Kittredge warns producers not to skimp on: “I grew up in the organic movement, but I heard almost nothing about trace elements in the first 20 years of farming. They’re key, crucial.” Which should organic producers be most aware of?

- Boron — 3 ppm ideally, but deficiencies are common with usual levels at 0.2 to 0.6 ppm.
- Manganese — 80 to 90 ppm ideally.
- Copper — 4 ppm ideally.
- Zinc — 8 ppm ideally.
- Cobalt — 2 ppm ideally. This nutrient

is a central part of the vitamin B12, which like humans, 80 percent of all soil life has a B12 dependency.

- Molybdenum — 1 ppm ideally. This nutrient helps plants with nitrogen fixation.
- Selenium — 0.5 ppm ideally.

“Whatever percentage of the ideal level of nutrients your soil is at, say only 10 percent, that is all the yield potential you’ll ever get — 10 percent of the yield potential,” Kittredge said. For example, “one tomato plant has a potential of 150 pounds, but the average tomato plant in the U.S. only produces six to eight pounds.”

This is obviously a shocking difference in yield potential for the producer, but the missed opportunities don’t stop there — poor soil nutrition affects consumers as well: “You can do everything else well,” Kittredge said, “but if you don’t have the crucial minerals in the soil that your plants need to live, they’ll never be fed as well as the need to be and will not produce fruits and vegetables with as much nutrition as they can.”

“Some producers do a good job of getting a high level of nutrients into their crops, and some growers do a poor job at getting nutrients into their crops,” he added. “From a consumer’s perspective, what they want is nutrition. They don’t really want pounds; they want quality.”

That’s what they’re paying the higher price tag for.

CORRECTING THE DEFICIENCIES

There are plenty of options of soil amendments to apply to correct deficiencies, but some producers have trouble calculating how much of each nutrient to add. Pounds per acre (ppa) basically equals ppm multiplied by two. To determine how much of a nutrient to apply, subtract the actual ppm from the ideal ppm and put it through the calculation to convert it to ppa. For example, let’s say the soil test shows a sulfur level of 25 ppm:

Ideal — Actual = X 2 = Amount to Apply (ppa)

75 ppm-25 ppm = 50 X 2 = 100 ppa
Once the amount of each mineral needed to be applied is calculated, and the amendments are selected, Kittredge recommended making a mix of the amendments and applying them at the same time.

“When applying trace elements, you want to do it in the fall. The best way to do this is in the compost. This gives plenty of time for these minerals to work into the soil and not have toxicity issues,” he said. One producer he knows applied his mineral mix too closely to the growing season and his tomatoes grew white instead of red; the problem was able to be resolved during the growing season, but this isn’t always the case. “Trace elements are like salt in the soup — a touch will pull the flavors together, too much will make it repugnant,” he added.

Correcting deficiencies is more than a matter of dumping on nutrients: “If you think of soil as a living system, we do not want to give the soil indigestion,” Kittredge said. “Effectively, it might take you two to three years for deficiencies to be addressed.”

Some producers see improvements in only a year, but they using other management techniques in combination with applying amendments to the soil.

OTHER TIPS FOR GROWERS

Improving soil nutrition is the most direct link to improving nutritional content of fruits and vegetables on consumers’ plates. But it’s only one of several factors producers should take into consideration to improve their yields. Here are few more to keep in mind:

- The bigger, heavier seeds have more vigor, so request seeds from companies that have larger test weights. And when selecting your own seeds, cull the late starters: The seedlings that are behind the bulk are the “runts of the litter” and will never catch up in terms of vigor or yield or quality of produce.

As Kittredge puts it, “the health of the mother will have a strong correlation to the health of the child.”

- Choose almost anything over sterile potting soil. Some options are compost, peat vermiculite, alfalfa meal, perlite, and kelp. Plants need the best start possible, and sterile potting soils don’t give seedlings the boost of nutrition they can get from other soil environments. Kittredge illustrates it this way: “I consider this [sterile potting soil] to injecting a person with an intravenous drip. We can be kept alive, but it’s not how we evolved to eat. We’re effectively teaching a plant to eat though an IV drip.”

- Tillage can be a useful tool in controlling weeds, but it is often used poorly. The result is a loss in soil profile and soil life, which translates into poor plant health. The presence of soil life, such as earthworms and bacteria, is a major indicator of soil health. A good baseline for organic soil is 25,000 species of bacteria and fungi, but most soils only have about 5,000. Reasons for this are damage from the fallout from nuclear testing and DDT use in the past, current widespread use of glyphosate and other chemicals, and the common practice of tillage. Kittredge advises using tillage as minimally as possible: “If you don’t need to go over it three times, then don’t. If you don’t need to till in the fall, then don’t. If you don’t need to go down six inches, then only go down two inches.”

- Pest resistance lies in the health of the plant. When plants are healthy, they are effectively indigestible to all types of pests, from bacterial and fungal diseases to insects. In addition, these naturally pest-resistant plants are often frost-hardy as well, able to survive 25-degree nights as if nothing happened.

- Weather patterns of late, across the country, have become unpredictable. Producers need to plan for both drought and flood conditions every year. A good soil moisture level is when soil that has been clenched into a ball remains in a ball. If it crumbles, more frequent irrigation is needed. Second only to soil nutrient deficiencies, lack of adequate soil moisture is a big reason for a poor crop.

- Foliar sprays are an effective way to feed plants, especially in mineral-deficient soils, through the growing season. Kittredge recommends a mist blower over the less expensive pump-action backpack sprayer for a small farm; it’s able to do a half acre in about half an hour. Foliar spraying should be done “when the birds are singing, when they are the loudest,” said Kittredge, but for late risers, 8 a.m. is about the latest in the morning to do the chore as spraying when there is too much direct sunlight will burn the leaves.

- Weeds are big issue in organic gardens, and weeding is a must for any grower who doesn’t want to lose a good deal of his potential yield to competing plants.

WHEN IN DOUBT, LOOK TO THE SOIL

If a plant appears sickly — diseased, stunted, producing small or few fruit — producers need to train themselves to look at the problem systematically, rather than symptomatically. They can treat the symptoms of a sickly plant, but it’s not until they address the base problem — the systemic issue of soil health that they can resolve it. By the time a plant begins to show signs of growth issues, it’s already three to four weeks into a deficiency, putting the crop well behind, Kittredge said.

Next week: Part 2 of 2 will discuss the price point conundrum of market gardeners — how do you determine how to price your produce so that it covers production costs but is still affordable to consumers?

S.D. Corn Growers Elect ‘12 Leaders

The South Dakota Corn Growers Association (SDCGA) has elected Mark Gross of Bridgewater to serve as president for 2012.

The board of directors met Feb. 23 in Pierre and also elected Keith Alverson of Chester as vice president and Kurt Stiefvater of Salem as secretary/treasurer. During the past year, Gross served as vice president and Alverson as secretary/treasurer.

Gross, a fourth-generation farmer in Hutchinson County, has served on the SDCGA board since 2007. He also is a member of the South Dakota Corn Utilization Council’s board of directors. He serves as vice-chairman of the South Dakota Value-Added Finance Authority Board, is past president of the Bridgewater Farmers Union Co-op and serves as a township clerk. He is a seed advisor for Golden Harvest Seeds and the owner of the Seed Mill in Bridgewater.

Alverson, a sixth-generation farmer, farms in partnership with his dad and uncle near Chester. He serves as a member of the National Corn Growers Association Corn Board and is past chairman of the NCGA’s Ethanol Committee. He served three years on the South Dakota Corn Utilization Council board of directors, including two years as vice president.

Stiefvater has served on the SDCGA board since January 2005 and represents the SDCGA on the Ag United board. He also serves as Richland Township supervisor, and is chairman of the South Dakota Center for Farm/Ranch Management at Mitchell Vo-Tec. He is a member of the McCook-Miner-Lake Cattlemen’s Association, South Dakota Soybean Association and the South Dakota Ag and Rural Leadership Class II.

Utica Angus

Breeder Lauded

ST. JOSEPH, Mo. — Christina Stark of Utica has been recognized nationally by the American Angus Association® for having 4 registered Angus cows included in the Association’s 2012 Pathfinder® Report.

Only 2,027 of the nearly 30,000 American Angus Association members are represented in this year’s report, according to Bill Bowman, chief operating officer and director of performance programs of the association.

The Pathfinder program identifies superior Angus cows based upon recorded performance traits economically important to efficient beef production. These traits include early and regular calving and heavy weaning weights, Bowman says. More than 1.9 million eligible dams and more than 6.5 million weaning records were examined to determine Pathfinder status. All registered Angus cows that meet the strict Pathfinder standards are listed, along with their owners, in the Pathfinder Report that is published annually by the Association.

The 2012 Pathfinder Report lists 8,761 individual cows and 231 Pathfinder sires. It is published online at www.angus.org, and printed copies are available from the Association. The largest number of Pathfinder cows from a single herd this year is 74.

Developing A Local Foods Market: Educating The Public

BY RITA BRHEL
P&D Correspondent



Rita
BRHEL

I live in a food desert. Well, I should specify — there is not a lot of good food out here, meaning the kind that is fresh, of a high quality, and highly nutritious. I live a half hour from any sizable town, any population center that could be classified as metro-ish. I live two hours away from any actual metro.

There is a local grocery store, but don’t go there for fresh fruits and vegetables — not unless you like your cabbage turning brown on the edges or your onions attracting flies. I only go there if I run out of mayonnaise in the middle of making a potato salad, because any products I’m interested in will probably be at its expiration date or they’ll likely not have in stock anyway. Forget about supporting your local, Main Street businesses — I drive an hour to two hours away for my groceries.

My husband and I already sell eggs, and we’re making plans to turn his gardening hobby into a business. Every year, we have

extra produce. Last year, some of our egg customers expressed interest in buying our extras. We sold several pounds of green beans, some cucumbers and tomatoes, and a few winter squash. But

we also learned that despite this interest, there were many people who needed help to learn how to cook with fresh foods. So, we learned that education is an inherent part of serving our customers. Not as easy as naming our price and getting our cash, but that’s OK.

But that’s not the only need for education. That local grocery store is staying open for a reason — people are obviously supporting it. It doesn’t offer a whole lot more than canned and boxed items, frozen TV dinners, a bit of dairy products, and of course the

scary fresh produce. We sell most of our eggs out of the immediate area. We learned real quick that people around here aren’t interested in farm-fresh eggs — they want cheap eggs, and unless our eggs were priced just under the store price, people would much sooner get them from the store, unless they ran out of eggs in the middle of making a cake and the store was closed. And the store wasn’t interested in selling our eggs, either, unless we were content to take bottom-dollar prices. So, we learned that people here look harder at the affordability of foods than the health benefits.

That means any potential market for our vegetables will likely be out of the area, too. I’m not giving up hope; I just think that perhaps we’re ahead of the curve for this area. The local foods movement is still making its way here.

Starting a business that relies on a local foods system is getting easier in the metro areas of the Midwest. Farmers markets, food coops, and other direct marketing avenues are prolific. People want fresh foods. They understand that

they have options in their food sources, and they care that there is a difference in food types. And that the higher price connotes that quality difference.

But starting a local foods business in a rural area is a whole other ballgame. This means that we’re at the frontlines of the local foods movement — we’re who has to educate consumers. This complicates matters a bit, of course. Creating a market is much harder than trying to sell in an established one, in my mind. But it does provide an awesome opportunity. One reason is because what we’re seriously considering is forming a CSA (Community Supported Agriculture), also known as a subscription farm, meaning that our CSA’s member dues would go toward buying seeds, labor, etc. and that in return our members would get a box of veggies and fruit and eggs and other items for as long as the subscription runs for. If we’re creating the market, we’re not competing with anyone else.

So, in this respect, along with considering the basic areas of

owning a business — production, sales and marketing, financial management, etc. — we have to consider education as a major component of the business. In effect, our business has to have both a money-making side to it as well as a nonprofit side to it. It’s new territory for me, but an interesting meshing of ideas. So, it’s

actually quite exciting. A little daunting, perhaps. Definitely a long-term commitment — markets don’t just appear overnight, movements don’t take hold at the first conversation. But exciting, nonetheless, as we consider going this route.

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