

Two Organic Farms—A Contrast in Styles

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As part of the Northeast Organic Network (NEON) Project, 11 outstanding organic vegetable and cash grain farms were studied in some detail over the 2002 and 2003 seasons. I'm going to present some of our findings on two of these farms which I feel show instructive contrasts.

Spiral Path Farm and Beech Grove Farm are in southern and northern central Pennsylvania, respectively. They are both set in isolated locations with hilly terrain and well-drained soils. Both owner couples choose to farm with organic methods. But from there, the styles of the farms diverge.

Mike and Terra Brownback, owners of Spiral Path Farm, felt that their local market could not support an organic farm that would provide a good living. So they put their contoured, relatively steep hillside fields into vegetables and geared up for the wholesale organic market in the early 1990's. They now grow 60 acres of organic crops, about 20 of which are double-cropped. They have been able to succeed in the difficult organic wholesale market through excellent management, good planning, and hard work. Meanwhile, they have improved their sloping soils.

Eric and Anne Nordell had similar goals, with important differences, when they established Beech Grove Farm in the early 1980's. They wanted to use draft horses as their main power source, and they wanted to keep the workload down to a level that the two of them could handle alone. So they took 7 relatively flat acres and established vegetable fields. The rest of their open land is in pasture. Their main markets are now restaurants and the Farmer's Market in Williamsport, about 20 miles away. Their cover crop program and excellent weed control are legendary among organic growers.

What makes these farms tick?

Spiral Path, a medium-sized, intensive vegetable farm

Spiral Path Farm supplies seasonal, high quality produce grown efficiently and cost-effectively to Northeast markets. They are able to get on their fields early, and use raised beds, black plastic and row covers to start harvesting lettuce and greens in May. About 25 acres of successive lettuce and salad greens are their most profitable crop targeted for the wholesale markets. This is followed in value by significant acreages of staked tomatoes, peppers, eggplant, cucumbers and summer and winter squash. They also grow smaller amounts of a diversity of brassicas, alliums and other vegetables and have serial plantings of important crops, to offer wholesale accounts "one-stop shopping."

Most of the 25 acres of early lettuce and greens are promptly replanted after harvest to squash, peppers, or tomatoes. The plastic is pulled, the beds subsoiled, disced and reformed, and plastic laid again. Sometimes additional compost is applied.

Their crew of Mexican workers, along with Mike and a couple field managers, quickly and skillfully establish the second crop. The tomatoes, for instance, are transplanted, pruned and staked. The field is in production again as their early field tomato plantings are winding down. According to NEON data, in 2002 a field of these late double-cropped tomatoes yielded over 60,000#/A of marketable fruit.

Similar purposefulness marks their approach to other crops. Yearly applications of twenty tons per acre of mushroom compost have boosted soil fertility to high levels. The fields are always plowed throwing the soil uphill, in the never-ending fight against gravity on this farm. They have a 125 HP IH 1066 for such heavy tillage; also a plastic layer designed for sloping contour fields.

Mike and Terra have invested in such well-chosen equipment and also in an excellent packing facility and a half-acre gutter-connected glass greenhouse for early tomato and transplant production. All of their crops are irrigated if necessary, most with drip under plastic. A 300-gallon per minute well supplies the water.

Twenty- to 40-foot wide mowed grass strips alternate on contour with the 40-60 foot wide vegetable strips, to help control erosion. These grass strips are also used as spray and harvest lanes, plus they provide habitat for beneficial organisms.

Pest management at Spiral Path ranges from lettuce (no sprays) to tomatoes and squash which each received several insecticide and fungicide sprays in 2002. Regular copper hydroxide sprays on the tomato crop undoubtedly contributed to its excellent yields in 2002, as early blight and other diseases were minimal through the season. Crop families are rotated through the fields on a regular basis, helping with pest control.

Not everything is perfect at Spiral Path Farm, of course. Deer get some of the lettuce; in the wet 2003 season, black rot hit the butternut squash pretty hard. Overall, about 65% of their total lettuce crop was sold in 2002—some lost to deer and heat, some left in the field unsold.

One long-term problem may result from too much a good thing. Looking at Table 1, nutrient levels look good—in fact, really good. However, extrapolating the nutrient increases into the future indicates that at some point, excessive values will be reached. Already, P values are getting high. These are the sorts of problems that a network such as NEON can help to overcome. Other NEON farmers and researchers are finding ways of maintaining high fertility and organic matter levels in an equilibrium situation. One farm, for instance, is incorporating wood chips into its compost to give long-term organic matter benefits without carrying many nutrients. NEON researchers are also looking at vegetable farm nutrient budgets and rotations that require less compost inputs. These

joint farmer-researcher efforts can enable the trend of nutrient accumulation to be remedied before it becomes a problem.

Spiral Path Farm is successful at producing large volumes of high quality organic vegetables while providing a good income and quality of life.

Beech Grove, a small-scale extensive vegetable farm

In spite of their relatively small acreage, the Nordells put 3 of their 7 acres in cover crops each year. And in spite of the common notion that draft horses are inefficient, imprecise, and uneconomical, this is an extremely well managed farm from many standpoints.

Eric and Anne have evolved a crop rotation that has profound effects on weed management and soil quality and fertility. They call it “extensive”, rather than intensive, vegetable farming. Their 6-acre upper main field is divided into 12 sections of about ½ acre each (roughly 8000 row feet per section at their 32” spacing). Each section alternates over the seasons between cash crops and cover crops with a fallow.

Between cash crop seasons, the Nordells use a combination of cover crops for enhancing soil nutrients and quality, plus a bare fallow period to kill flushes of weed seedlings. For instance, typically they might have seeded rye the preceding fall after their cash crops. The rye would be mowed twice in the following May and June, then plowed in. A bare fallow period of about 4-6 weeks is maintained by harrowing with a springtooth about every 10 days. Then oats and field peas are planted. These will winterkill, and be easy to till under for next season’s cash crop.

Over the years, this alternating cash crop/fallow system has resulted in a remarkably low weed seed bank. For instance, 24 weed samples taken in 2002 lettuce crops at harvest showed an average of less than 10 lb fresh weight of weeds per acre in their fields. The lettuce had been cultivated but received no hand weeding.

There is no irrigation source for the upper field—all crops are grown on the 32” spacing, which tends to allow for a large volume of soil to be provided for each plant, so that more rainfall is available for the crop. It is crucial for soil quality to be high so all rainfall can be captured in place and stored.

Beech Grove Farm specializes in cool-weather crops such as lettuce and spinach grown throughout the season, plus root crops like potatoes, carrots, and onions. Yields of some crops might be expected to be low on this farm, since all crops are planted on a 32” row spacing. However it is interesting to note that lettuce on a 9”x 32” spacing (21780 plants per acre) compares favorably with 4-row beds spaced at 12” between plants, with beds on 7’ centers (24890 plants/A). The Nordell’s small scale and flexible marketing enable them to sell almost 100% of their marketable lettuce heads (93% of their total stand in 2002). On the other hand, per acre carrot, onion, and beet yields are significantly reduced because of the wide spacing.

Few pesticides are used on this farm. Bt is sometimes used on cabbage family crops, and sometimes a pesticide is sprayed against flea beetles, cucumber beetles, or potato beetles. But most of the crops receive no sprays. The Nordells have focused on cultural management for some troublesome pests. Crop rows are interspersed rather than planted in blocks so that the fields are heavily intercropped. Buckwheat strips are repeatedly planted throughout the fields so that there is continuous bloom, serving as a trap crop for tarnished plant bug. They have reduced the amount of legume cover crop that gets mowed in midseason, also to prevent TPB migration onto crop plants. In the hot, dry season of 2002, thrips became a problem in their onions. Eric and Anne are working on how they might change their winter grain cover crop management to reduce this source of onion thrips.

They employ a novel technique to reduce slug populations that are encouraged by their high levels of cover cropping and residues. Chickens are fenced for several weeks into areas slated the following year for crops such as lettuce in which slugs are a serious problem. From their observations, the chickens greatly reduce slug pressure there early the next season.

There are special and rather subtle aspects of this system—for instance, which cover crops are best to prepare for early vs. late-planted crops the following season? Also, the Nordells are looking to enhance their soil quality further by reducing tillage closer to a no-till system. They are using ridge tillage to increase the soil temperature in mostly untilled soil. The Nordells have adapted their horse drawn equipment to create ridges and handle them with reduced tillage seedling and cultivation.

One drawback of this system is that it depends on an extremely high level of skill and knowledge on the part of the farmers. The diversity of tasks with animals and vegetable crops keeps things interesting, but makes for a heavy workload for two people.

I have contrasted these farms to make them more instructive. However, they have many things in common: Both are known for excellent quality production; both extend their season with greenhouses or hoophouses; both use equipment adapted or modified to their specialized systems; all four of the owners work long hours. These farms are on the cutting edge of organic farming, and provide important insights on how to manage a successful organic vegetable farm in the Northeast.

Table 1. SPIRAL PATH SOIL TESTS

	FIELD 1998	A4 2000	FIELD C10 1998	2000
pH	6.9	7.1	7.1	7.2
OM	1.4	4.1	3.3	4.1
P-Bray 1	60	114	41	65
P-Bray 2	89	240	69	161
K	215	273	161	178
Mg	234	217	130	149
Ca	1740	2100	1440	1600

Table 2. 2002 Yields (wet spring, dry summer)

	Beech Grove 2002 Yield #/A	Spiral Path 2002 Yield #/A	NYS Average Yield #/A
Carrot	18,400		26,000
Onion	8,800-12,000		35,000
Lettuce	1550 doz	780 doz	25,000
Tomato		30,000-61,000	20,000
Winter Squash		19,000	30,000