
# Rooted in the Soil

## Sterling Formulations Offers Earth-Friendly Field Treatments

STORY BY **SHAWNDRA MILLER** | PHOTOS BY **JOSH MARSHALL**

A conversation with a local organic farmer started Sterling Formulations, a small Shelbyville-based business, in an unexpected direction — a move that helps Indiana's small-scale and organic farmers.

Late in 2013 Bill and Becca Selkirk, partners with Vince Plowman in Sterling Formulations, drove to Carthage in search of locally grown grain and beans. With a daughter serving as chef at Bluebeard restaurant in Indianapolis, they hoped to find products to augment the restaurant's menu.

They found that and more. In fact, a whole new customer base opened up when they connected with Anna Welch. She and her partners in Fields of Agape, located in Rush and Henry counties, grow organic grains, beans and seeds.

When she learned that the company had just branched out from industrial to agricultural products, she jumped at the chance to learn more.

The recession had slowed Sterling Formulations' work on the metal manufacturing side — industrial solvents, cleaners, coatings and the like — so the partners had begun working on a new set of products to serve lawn care companies and industrial agriculture. They'd developed a line of earth-friendly fertilizers and amendments and lined up a distributor to market them to large-scale farmers growing corn, beans and potatoes conventionally.

They never anticipated selling directly to organic farmers, but Welch explained why organic farmers needed help, too. She and her husband, Keith, had tried various organic products on their fields, such as fish emulsion and molasses, common additives in organic growing. But they ended up with 8-foot-high foxtail and other weeds clogging the plots and hurting their yields. "You can't generally apply this stuff when you're in organic farming," Welch says. "You just shoot your own foot off."

A one-size-fits-all application is harmful because, according to biochemist Bill Selkirk, micronutrients in the soil affect the growth of weeds in very specific ways. Consulting with a team that includes an Amish farmer and an agronomist, Selkirk is responsible for Sterling Formulations' recommendations once soil samples are analyzed. He prescribes particular combinations of additives based on the balance of micronutrients already present in each field.

Most of the ingredients in Sterling Formulations' products are certified by OMRI, the body that determines acceptability for organic applications. So even though the products are in use on both conventional and transitional/organic fields, they're soil-friendly. Many of the formulations are on their way to official organic certification.

Though it may seem unusual to blend organic and conventional markets in this way, it makes perfect sense to the three principals. Their concern is the health of the soil, which is the foundation of healthy plants, regardless of farming philosophy.

As Plowman puts it: "We look at the soil, the microbes, all the activity in the soil, because we believe at the end of the day that that grows healthier plants. We're big believers that we shouldn't be dumping mounds of nitrogen on the fields. That's detrimental to the soil."

That approach resonated with Welch and other organic and transitional farmers in the area, and word quickly spread. "All of a sudden there were six growers (customers), just by word of mouth," Becca Selkirk recalls. By this spring that number had doubled.

Plowman, who takes the lead on marketing and sales matters for the company, says it's remarkable how quickly the organic market fell into place. Standing next to an enormous drum full of fermenting kelp in the Shelbyville production facility, he recalls, "We did not go out and solicit that business. Of all the things you go out and bust your hump for, that business just came to us.

"It was really just because there's such high demand for some kind of infrastructure and help in this state. People are having to buy (fertilizer) from Wisconsin, Minnesota, Pennsylvania — and do you think they get any kind of support? No."

Though he's president of the company, Plowman has his hands as deep in production as anyone else. In fact, he's been christened "Captain Kelp" because he can so often be found ascending a ladder to work with these vats of kelp.

The sea vegetable contains naturally occurring plant growth hormones, offering a huge boost to crops, so it's an ingredient in many of the company's formulations.

But that's just one piece of the complex picture that emerges when Sterling Formulations assesses a farm's crop needs. In Fields of Agape's case, one field, infested with Canada thistle, was determined to have low levels of manganese. "Weeds grow because the soil is out of balance," says Plowman. They also take up nutrients meant for the crops, leading to poor yields. Canada thistle thrives on manganese-poor soil, so addressing that imbalance is a key strategy to its elimination.

Bill Selkirk proposed a three-year corrective plan to return the soil to balance, which Anna and Keith Welch are implementing under Sterling Formulations' guidance.

"It can take two to three years to get the soil back right," Plowman says. "But we will see over the years that weed counts go down, and crop production goes up."

As two staffers fill jugs with a concentrated foliar spray mix, he explains how organic growers have suffered for lack of scientific, individualized support.

The typical advice for organic farmers involves annual applications of composted chicken manure. Plowman says that knowledge base leaves out a crucial bit of information. "What we're finding is, they're putting so much nitrogen down in the form of chicken poop that they're killing the microbes in the soil," he explains. "The whole concept of organic farming is for the soil to become sustainable through microbes. In fact they've been doing the same damage to the soil that conventional farmers were, and unfortunately they didn't have chemicals to get good growth out of their crops."

But Sterling Formulations' specialty is addressing the imbalances in various soils and supporting the health and vigor of the vegetables, grains or beans grown there.

It's common knowledge that different crops have different nutrient needs and that beans tend to put back what corn has depleted. But the larger picture of nutrient interplay is much more complex.

"Everybody knows about NPK, nitrogen, phosphorus and potassium, the value of those," Plowman says. "The ability of those three biggies to be taken up by the plant is largely due to the boron levels, calcium levels and so on. These micronutrients people don't often pay attention to are very important."

Anna Welch believes Sterling Formulations' work will help mitigate the risks around raising food organically. "This is a breakthrough. … The customization of field treatment is a huge step forward in organic farming in Indiana."

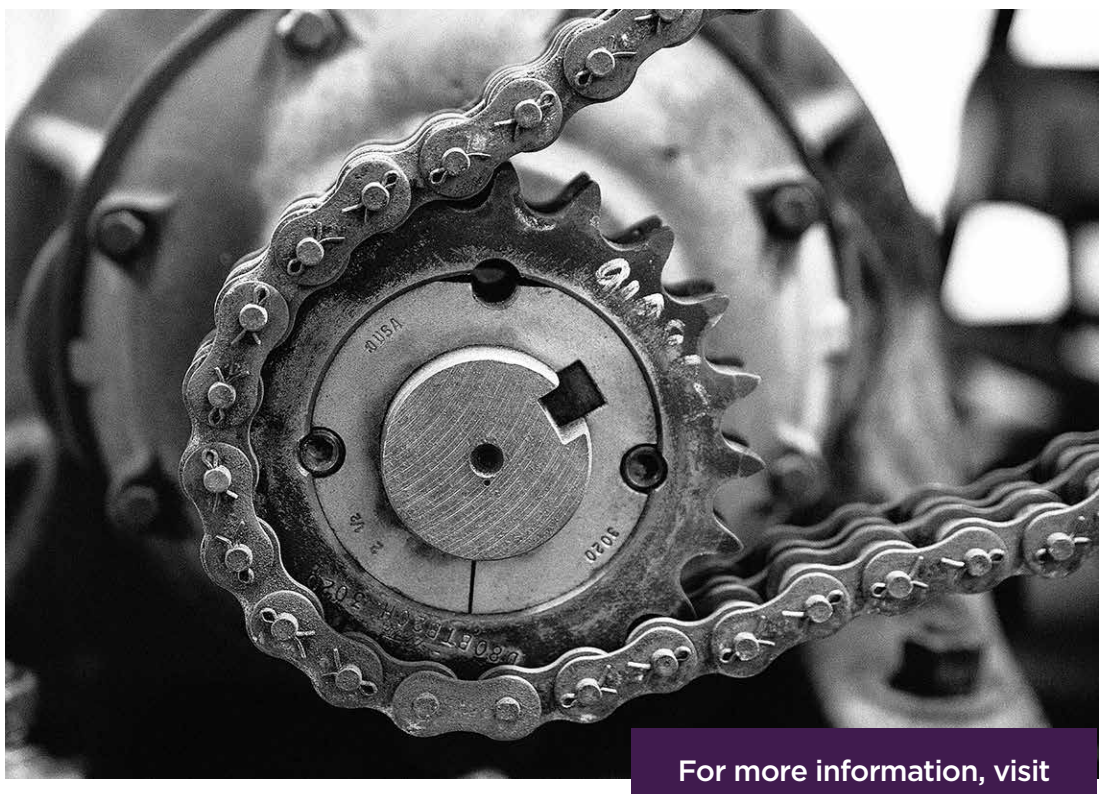
John Pavey is another small-scale grower trying Sterling Formulations' additives for the first time this year. He grows vegetables for Green Bean Delivery and other outlets on 23 acres in Rush County. In his third year of growing on former pasture land, he knew he would need to augment his soil because of nutrient depletion from harvesting crops.

Each of his seven plots requires a different formulation based on its makeup and the demands of the plants being grown there. He plans to use a kelp-based foliar feed spray on his beans and potatoes as well as soil amendments.

Though it's too early in the growing season to measure the impact of Sterling Formulations' involvement, Pavey has every confidence in the company's approach.

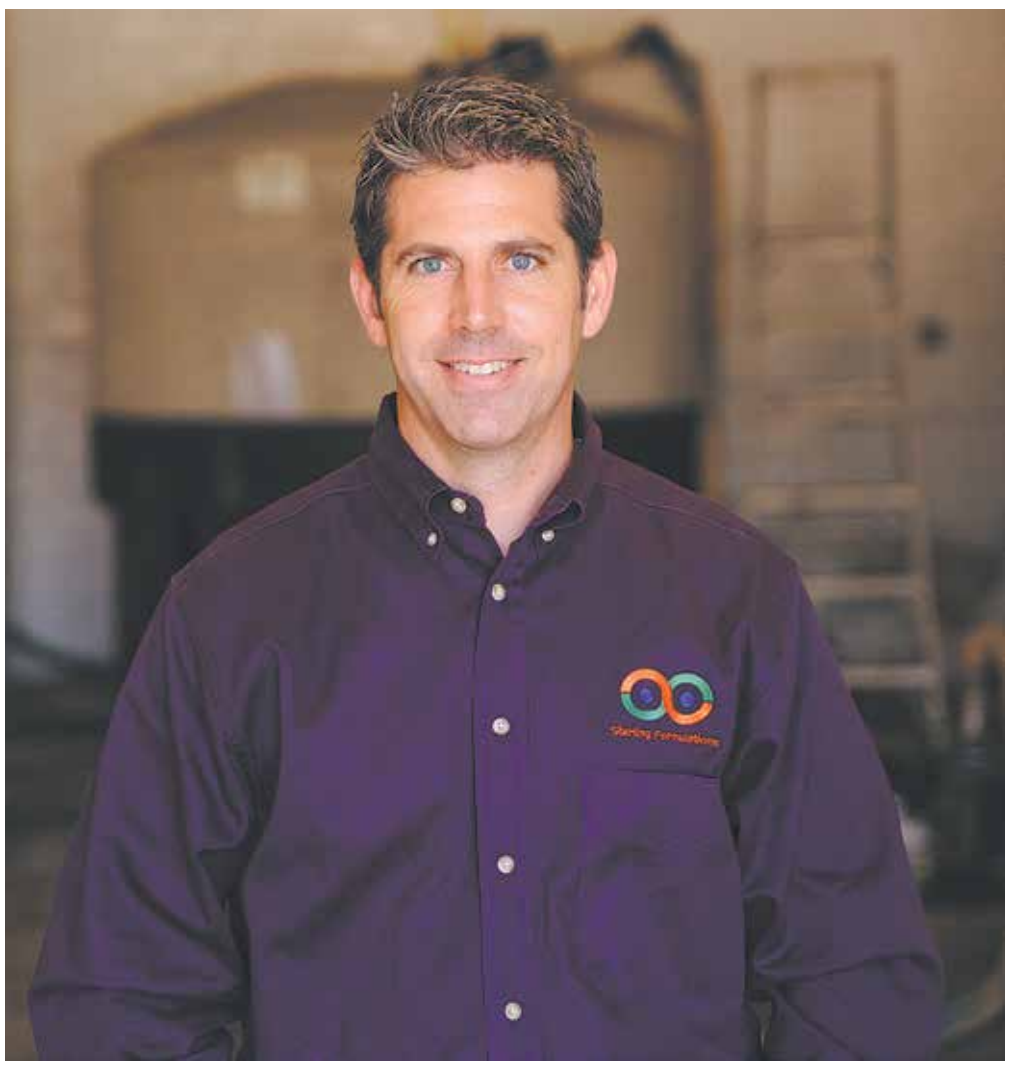
"There's no doubt I think we're going to see good results," he says. "When you test the soil and it shows needs, and you take care of those needs, Mother Nature is pretty kind to reward you."

Pavey started with land that was in



For more information, visit sterlingformulations.com.

**TOP LEFT:** Dried kelp will be fermented and harvested as natural liquid fertilizer. **TOP RIGHT:** Beakers and funnels sit in the Sterling Formulations laboratory ready for use in analyzing products. **OPPOSITE PAGE, LEFT:** Vince Plowman. **OPPOSITE PAGE, RIGHT:** A surface layer forms on the top of fermenting kelp.



## Why are soil microbes important?

The level of microbial life in the soil is directly linked to crop production. About 50 billion microbes live in one tablespoon of soil, according to North Carolina State University's Cooperative Extension Service. These soil creatures include bacteria and fungi that aid plants' growth, production and resistance to disease.

Microbes are responsible for converting the nitrogen, phosphorus, potassium and minerals in the soil into a form plants can use. These microorganisms digest field stubble into organic matter, and the higher the organic matter, the more nutrients are available to plants.

Bill Selkirk notes that if a soil contains 3 percent organic matter, that offers plants about 90 pounds of nitrogen per acre. At 7 percent organic matter, 210 pounds of nitrogen are available per acre. (Amish farm fields typically contain 7 percent organic matter, while conventionally farmed fields have very little.)

Corn requires 200 to 250 pounds of nitrogen per acre. So in a field containing 7 percent organic matter, little to no additional nitrogen would be needed, even for one of the most nitrogen-hungry crops.

That's why Selkirk advocates adding microbes to the soil and switching from petrochemical fertilizers to soil-friendly formulations — to bring back the natural processes that support plant growth.

"pretty good shape" since it had been pasture for years. But on the conventional side, where soil tends to be quite depleted, using Sterling Formulations' soil-friendly products is a departure from business-as-usual. The impact can be dramatic.

Recommendations usually include a product called Buncha Bugs to replace microbes lost to chemical applications, along with a kelp-based product called Start Rite.

Farmers using these products in test plots alongside conventionally treated fields reported seed corn germination within three days, Plowman says. "Customers are getting germination a week earlier than what they were getting in conventional plots," he says, "and in the farming world, that's an eon. Especially in a short spring like we're having."

Bill Selkirk notes that an agronomist colleague recently gave him an idea of just how damaging such a wet, chilly and prolonged spring can be for plants, especially if it's followed by a blazing hot summer. "It's like your baby is just home from the hospital and you've sent it to senior (graduation), and it can't handle it."

So anything that can stabilize seeds more quickly in cold soil gives farmers a leg up. In effect, Sterling Formulations wraps an extra sweater around the infant, feeds it a fortified breakfast and stands up to bully weeds — all to give it a fighting chance on its way to graduation day.

For Anna Welch's part, she's excited not only about remediating her own fields, but about the possibilities Sterling Formulations represents for area farmers of all stripes.

For those interested in transitioning to organic methods, Bill Selkirk and the rest of the team can help them through the preparation. Often the switch from petrochemical-based farming to organic leads to a dramatic decline in yields in the first year. That's because the plants' life support is suddenly withdrawn before the soil is rebuilt.

But with earth-friendly products helping to first prepare the way, farmers can avoid a large drop in production.

So Anna Welch has continued to spread the word. "We have a new field partner who's a conventional farmer and wants to transition his land (to organic)," she says. With such early adopters testing out Sterling Formulations' products, she hopes to see many more make the move to earth-friendly farming methods in the coming years. *FI