

Foundation Farm Visit: A No-Till Farm Adventure

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Katie Kilpatrick was an intern at the Kerr Center in 2012. See her biographical sketch on the last page of this report.

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On Wednesday, June 27, 2012, the summer interns and horticulture program assistant Luke Freeman visited Foundation Farm in Eureka Springs, Arkansas. Patrice Gros is the farmer; he is from France and has been farming in Eureka Springs for eight years. The unique thing about the farm is that it is certified organic and it's completely no-till. He doesn't own a tractor, rototiller, discs, or any other large equipment for turning the soil. His main tools are rakes, wheelbarrows, and mulch. He sees no reason to till the soil when the "soil food web" made of microbes and all the fauna that feeds on it are in such a perfect balance with the existing soil structure.

Foundation Farm sits on ten acres. Of that, six are in production, but of *that*, only under one acre is growing vegetables - the rest of the area is paths and cleaning space. The production area is divided into six zones, each 6,000 square feet. One is left fallow each year, growing a cover crop only. In each zone, the beds are divided into sections 4 feet wide by 100 to 150 feet long, with a two-foot path in between. Permanent paths are a necessity on a no-till farm to allow the farmer to never set foot in a bed, thereby avoiding compaction.

Prior to visiting the farm, I did a little research into no-till farming. I read *Weedless Gardening*, by Lee Reich, *Organic Gardening the Natural No-Dig Way*, by Charles Dowding, and *Teaming with Microbes*, by Jeff Lowenfels and Wayne Lewis. The main reasons farmers choose to go no-till is to preserve the soil structure and allow the microbes, worms, and other living organisms to maintain their habitat. By doing so, the cavities formed by worms, roots, and freeze/thaw cycles can remain; they offer valuable space for water and air molecules to stay in the soil. Many farmers chose to till so they can incorporate organic matter, often in the form of compost. Proponents of no-till gardening argue that by leaving organic matter on the surface of the soil, the system mimics nature more and the

matter protects the soil from direct sun and hard rain. Also, by not tilling, one does not turn weed seeds up to the surface where they can germinate, nor does one compact the soil under heavy tractors or even human feet.

In *Weedless Gardening*, Reich is a big proponent of mulching - a lot! In each of his beds, he lays down one inch of compost and covers that with one to five inches of mulch. That smothers most weeds and helps retain soil moisture, which keeps both the plants and the soil life happy. He uses drip tape in all his beds to accurately water each plant and the soil around it. For Charles Dowding, the most important aspect of no-till gardening is sowing seeds at the appropriate time. By doing so, most pests and diseases won't be a problem and the weather will (hopefully) be at the optimal place for the plant. Dowding also applies compost to the top of his soil and mulches when necessary; rather than mulch heavily, he plants heavily so the vegetables will shade out most weeds. He believes weeds are a result of bare soil that needs to be protected. To that end, he transplants new plants as he harvests or pulls up old plants. Finally, Lowenfels and Lewis, authors of *Teaming with Microbes*, focus only on the soil in a garden; they want the soil food web to be optimal because that will produce an optimal garden - one full of checks and balances among pests and beneficial insects. They believe every gardener and farmer needs to understand basic soil *biology* (rather than just the chemistry) before beginning to grow anything. "Small" things like the fungi to bacteria ratio, the amount of organic matter in the soil, and the form of nitrogen in the soil are extremely important to the health of the plants growing in the soil.

When I asked Patrice Gros who or what his inspiration is for his farm, he said Elaine Ingham (a world leader in soil microbiology) and *Teaming with Microbes*. I was excited because that was my favorite book of the three. When we toured his

farm, it became apparent his is interested in soil microbiology. While he's never had a Soil Food Web analysis, he's quite certain the flora and fauna of the soil are in equilibrium: his plants are always happy! He mulches, much like Lee Reich, but he does not apply compost to any of his beds. Sometimes he applies rabbit manure to the beds and at most, he sprinkles a little nitrogen fertilizer on his soil in the form of feather meal, fishmeal, or cottonseed meal. Each year, Gros uses up to 600 straw bales for mulch. Extraordinarily enough, he uses mulch to establish a new bed, even when the ground is a lawn. He mows the grass and then lays down a foot of mulch and plants directly into that! To maintain existing beds he simply mulches more. Grass from the permanent paths does not grow into the beds because it is non-invasive and the mulch prevents it from growing under it.

The no-till method is extremely sustainable; it uses no equipment that requires gas, involves a feasible amount of labor, and returns nutrients to the soil to keep the soil food web in balance without using harsh chemicals. Besides being sustainable, it is profitable! Patrice told us he grosses \$60,000 a year and keeps 75% of it! He employs two workers (each of whom work two mornings a week), he works on the farm three mornings a week for six hours and he goes to market three mornings a week. That leaves him one day off and most afternoons free! The majority of his expenses come in paying for gasoline to drive his truck to the Fayetteville Farmers Market.

This no-till methodology is applicable to the Kerr Center; however, it would have to occur in a plot that is already in use. It would be impossible to start a no-till plot in a bermudagrass pasture. The grass would never die! If we did implement no-till in a section of the existing plots, I think it would work very well. It would require less labor and definitely less equipment. Hopefully, because the soil is

already in relatively good shape, no amendments would need to be made outside of an occasional application of compost and/or compost tea. Mulch is not hard to come by here, and moving it to the plot would be the bulk of the work. Allowing the soil to develop structure over a long period of time would be extremely beneficial to the plants. Patrice demonstrated an extremely sustainable farm system, and I'm surprised more farmers don't use this practice! The Kerr Center ought to experiment with no-till beds so we can teach other farmers about the benefits to the plants and, most especially, the soil!

About Katie Kilpatrick



Katie Kilpatrick was a two-time horticulture intern at the Kerr Center: once in the summer of 2012, and again in the fall of 2013.

She is a graduate of Hendrix College in Conway, Arkansas. She majored in environmental studies, and wrote her senior thesis on municipal-scale vermicomposting - a topic inspired by a project she undertook during her first Kerr internship. (The thesis is available in full on the Kerr Center website.)