Highlights >>> How to Grow a Living Soil

Soil quality can be thought of as a stool, supported by three legs: structure, organic matter and a diverse and active biological community. All three work together to create a healthy system which supports plant growth be it in natural ecosystems, agricultural fields or the home garden.

Structure improves soil as a medium for plant growth and provides the habitat for biological activity. The gluing together of sand, silt and clay particles creates a range of pore sizes not possible with these soil components alone. Larger pores facilitate gas exchange and drainage while allowing easier root growth. Smaller pores store water and protect the microbes, the smallest members of the biological community.

Organic matter is the fuel which drives the system. The biological community decomposes plant residue and animal waste, releasing nutrients in plant available forms. Their waste glues primary soil particles together improving soil structure.

Soil life is the key to the system. Bacteria and fungi cycle nutrients and improve structure. Earthworms and night crawlers redistribute organic matter and concentrate nutrients while creating “biopores” which improve gas exchange, drainage and root growth. Other classes perform similar duties while mixing soil.

Kick out any of the individual legs and the system falls apart. The following practical steps can keep the stool upright.

**Minimize tillage**
Tillage destroys structure and biological habitat. It also introduces a pulse of oxygen which stimulates the biological oxidation of organic matter. Tillage disrupts biopores and the communities which produce them, resulting in population declines. It also harms mycorrhizal fungi whose intimate association with plants improves water and nutrient uptake and whose waste product, glomalin, is biological “super glue” which binds soil particle together in a water proof manner.

**Keep the surface covered**
The energy of a raindrop impact has a devastating impact on soil structure. Clay particles become detached and fill pore spaces creating a soil crust. This reduces gas exchange and water infiltration, inhibiting subsurface biological activity including root growth and promotes soil erosion and nutrient run-off on slopes. Conservation tillage which leaves more residue on the surface, mulching and cover crops all protect the surface in absence of a crop canopy.

**Manage traffic**
The physical force of traffic, whether large equipment in the field or walking between rows in the garden can destroy structure in the process of compaction. Compaction reduces total pore space and harms the habitat of soil life. The risk of compaction increases as soils become wetter. Soil will bear traffic with minimal effect when a handful of lightly compacted soil can be readily teased apart with minimal effort.

**Add organic matter**
Returning organic matter to the soil in the form of compost or manure adds nutrients, stimulates biological activity and can improve tight soils by acting as a bulking agent, increasing pore space.

**Use cover crops**
These unharvested crops are grown to protect soil and often their green tissues are returned to the soil. This addition of fresh, readily decomposable organic material will stimulate a pulse of biological activity and the soil quality benefits which come from it. Many legume species will promote mycorrhizal abundance and glomalin production.
Agricultural Diversity & Conservation Programs

For many years, Wisconsin benefited from having Senator Herb Kohl as a member and then chair of the Senate Appropriations Agriculture Subcommittee and having Congressman David Obey as the top House Democrat on the full Appropriations Committee. Both bodies oversee annual funding decisions for agricultural programs whose funding was not already mandated by Congress in the Farm Bill. Senator Kohl and Congressman Obey made billions of dollars available for credit, research, value-added, and many other programs that benefitted Wisconsin farmers, agricultural businesses, and rural communities well.

So it’s very exciting that in February, Wisconsin’s junior Senator Tammy Baldwin was appointed to the Appropriations Agriculture Subcommittee. MFAI had actively encouraged her appointment and sought fellow agricultural groups to do the same. Given the $88 billion that Wisconsin’s diversified agricultural industry brings into the state’s coffers each year, I suspect she will find, as I believe Senator Kohl did, that there is support from many quarters for programs that strengthen agriculture’s diversity, reward innovation, and build on a foundation of conserving the land and water resources that undergird agriculture.

Actually, we shouldn’t even have to point out the importance of conservation programs, because they are among those programs whose funding was mandated in the Farm Bill, so that appropriators have no reason to even consider their funding levels for another five years, and are not supposed to do so. However, in a painful and short-sighted irony, in recent years, federal conservation programs have been among the first programs to be cut.

The Gardens 2015

Despite the cold weather the last couple of weeks Spring is almost here and that means things are starting to move & shake in The Garden Department of Michael Fields. This year we are welcoming three Apprentices: Julie Battaille, Rebecca Wasserman-Olin and Tyler Delsart. You may recognize Julie and Tyler from last year. Along with Rebecca, who interned at Troy Farm in Madison, they are part of our new second year program which will focus on management skills, whole farm planning and business planning to help them reach their goal of starting their own farms in the near future. The Apprentices will be the first to arrive in March and I can’t wait for their energy and extra hands.

The Intern Program will begin in May this year. Students once again are coming from around the world to learn small scale farming and the importance of a local food system. This season we’ll be welcoming Susana Castro from Mexico, Hoa Dao from Vietnam, Mojca Horvat from Slovenia, Aki Norton from Milwaukee (but a recent transplant from Japan), Monica Hanson from Waukesha and David Mroch from East Troy. The Intern Program focuses on educational classes to build knowledge and skills growing, transplanting, maintaining and harvesting our 4+ acre market gardens. They are exposed to marketing, CRAFT field tours to other farms and workshops held here through Whole Farm Workshops, as well as, at other farms to help expand their knowledge of farming styles and enterprises.

Last year we had a wonderful group of Worker-Share Volunteers and we’re looking forward to having them again. There’s still space available if you are interested. Our program requires a commitment of 4-6 hrs per week in exchange for free organic veggies and fruit that we grow here on the farm. We’ll have more information and an orientation meeting later this spring. Again watch our website and Facebook for updates.

Our selling season begins in May with markets in Lake Geneva and Beloit. Please spread the word! We’d love to connect with you again at the markets. We should have some yummy greens and asparagus and possibly some carrots, onions and garlic. Watch our Facebook page for weekly updates as to what’s in season.

Think Spring!
From the Director’s Desk

As Executive Director of Michael Fields Agricultural Institute, I was fortunate to have the opportunity to attend the International Biodynamic conference in Dornach, Switzerland in early February of this year.

Many might ask what I was doing flying to Europe for a conference on biodynamics. First, what is biodynamics? The short answer is biodynamics is a higher form of organic agriculture based on treating a farm as it’s own sustainable organism and by using the soils, plants, and product from that farm entity; it will then become healthy and productive in and of itself. Getting back to the question of why I attended the conference. Originally, when MFAI was founded, the Founders had a dream of introducing biodynamics to America because it is a more healthy way to produce food that does not rely on inorganic fertilizer and the use of chemicals to control weeds and pests. The USDA with the help and encouragement of large agribusiness is slowly “watering down” what it means to be organic. As a former conventional farmer from Iowa, I did not know much about biodynamics and I need to learn the benefits and the challenges of what it means to be biodynamic. Longer term, one of the goals of the Institute is to establish a biodynamic demonstration farm here in East Troy. Will we be successful? Again, the short answer is, only with the support of the local community. We need local support and appreciation for what can come from having a demonstration farm of this type as a model for Midwestern agriculture. The challenges from climate change, reduced availability and use of fossil fuels, and the need to go back to more locally sourced food supply as the population grows will make it all the more necessary. Will it happen overnight, I doubt it. It will take five to ten years to see a biodynamic demonstration farm become self-sustaining, but it is a goal and I am confident we will succeed.

How do we gain a foothold in the mainstream US agriculture? The answer is complex due to market realities (economics—everyone needs to make money), corporate influence, and public policy. In the case of the work of Michael Fields, we believe the place to begin is with smart, evidence-based agricultural research followed up by outreach-based education. Research on biodynamics will become part of what we do at the Institute. By becoming involved in biodynamics, we know we will have questions, but we are also confident we will find the answers. We already know organic agriculture makes sense, so let’s take it a step further and see if biodynamics does as well. By doing this we hope to level the playing field so it leads society to healthy farms and healthy communities.

I would like to end with a story. Shortly after coming to MFAI in 2010, I went back to Ames, Iowa for an Iowa State University Field Day. During a break for lunch I saw a friend, Gary Guthrie, who operates a CSA (Community Supported Agriculture) just outside of Ames, which Sandy and I belonged to. That day, Gary had his father Bud with him who was getting up in years. I knew him as Professor Guthrie, I asked Bud what he had been working on, assuming it was some new insect pest, but instead he said he was becoming quite concerned with where society was headed. He gave me the following example:

♦ From the beginning of homo sapiens to the time of Christ (around 16,000 years) the population stood at 250 million, he referred to this as the year zero (0)
♦ From the year zero to 1776 the population on the planet grew to one billion
♦ In 1924, 148 years later it doubled to two billion
♦ In Bud Guthrie’s lifetime 1924-2010, 86 years, it grew to 6.5 billion
♦ In other words, more humans were born in the last 87 years than in the previous 162,000 years

His conclusions were: all life needs four things to survive. Food (food that is not tainted with chemical residue)....healthy, unprocessed food is becoming more scarce. Water is becoming more polluted and it will become more limited. Shelter (housing) is becoming more expensive, everyone wants a three-car garage with more space. Space is running out. Unless something changes, it is not an optimistic outlook, but we can’t give up, we try to change things one person, one farm and one community at a time. As I have said before there are things “happening” at Michael Fields Agricultural Institute. Please join us, one thing I can say with confidence, “it’s going to be an interesting ride.”

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Summer Environmental/Nature Class  Grades K-5
Tuesdays, June 16-July 21, 2015  9-11 am (6 weeks)
Learn, explore and play in the gardens!
Plant and nurture vegetables and the soil, learn about pollinators (bees and butterflies!), play in and explore Honey Creek, photograph nature, and more!
Visit www.michaelfields.org for more information and to register or call 262-642-3303 ext. 124

Upcoming Workshops

Tractors and Implements  April 10th, 9 am—Noon
Hands-on training learning. Youth 16-18 attend free.

Cover Crops Field Day  August 14th  Details coming soon.

Summer Reading in the Garden
Sunday, June 28, 2015, 3–5 pm
Featuring Wisconsin Author and Photographer, Richard Quinney.
Check out his books at http://borderlandbooks.net/
Tour our organic gardens, enjoy a sip of local wine, and a taste of locally grown and prepared appetizers.
Visit www.michaelfields.org for more information and to register or call 262-642-3303 ext. 124