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## **In This Issue:**

A Message From the Chair .....	1
Yoga for Soil and Self.....	2
Mulching and Tree Fruit Systems .....	4
Building Soil Using Chickens and Permaculture Design.....	5
Keep Your Soil in its Place!.....	6
Soil, Plants and Drought / Soil, Plants and Cloudy Wet Periods.....	7
Soil Health .....	8
2015: International Year of Soils.....	9
MOFFA News .....	10

## **Greetings—**

Mild weather hails us these holiday morns – quite a contrast to our experience of 365 days ago! Wonderful to see the soaking rains sink into the soil knowing that soon a change will come to plunge native environs deeper into hibernation and rest, before the rebirth and renewal that awaits.

Always a time of deep reflection with the beginning of a new calendar year. Whether young or not so young we have now a moment to pause and assess. Does optimism triumph or does a skeptic countenance frame your being? Or if like most are there many hues to your rainbow?

As farmers and gardeners and appreciators of sustainable living we are closely attuned to the physical world in which we are significant contributing factors. All humanity has an impact on the future of this planet but with more knowledge do you believe there is vested more of an obligation to act and react?



This issue of Organic Connections has focused on the soil. Microbial teeming, sweet smelling, organic matter richly friable, hands and arms thrust up to the elbows, beauty-to-behold soil – with the water from which we emerged and the air that bestows life with each breath – the essentials of our existence. Very basic stuff. Right? Yet all are under massive assault from the 7.5 billion and counting of our species.

As one individual it is easy to feel a tad overwhelmed by humanity's legacy to date. But always being sort of a "glass half full" individual, I find those are very fleeting moments. Dig-in folks, literally! We all know the joy and deep sense of satisfaction rolling in the "dirt". This is really an easy way to contribute significantly to your sense of purpose (never underestimate this!) and the health and well-being of others. The most significant and fulfilling endeavors involve one-on-one interaction. Time and again wiser voices have expressed the adage that it all really begins at the local level – change mushrooms from there. We can only take personal responsibility for the space we occupy – invite someone in, show them what you know – be it the three-year-old granddaughter, the wayward teen, the noisy know-it-all neighbor, it matters not. Just spread the knowledge and teach care for the planet through the nurturing of its soil.

There appears daily to be more of a conscious awakening – the slumbering dragon of knowledge has too often in the past opened one unblinking eye and rolled over. For all the foibles of the IT age we have definitely evolved into one interconnected entity. Easy enough to bemoan what is not right for the world (as we interpret it); much more enjoyable and productive to celebrate our existence. There is hope for the future – may 2015 open new pathways for you and bestow world-wide sustainable prosperity for all.

The MOFFA Board aspires to diligently promote organic agriculture and to assist all, members and non, with their pursuits in 2015.

Happy New Year  
— Enjoy, John H.

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## Yoga for Soil and Self

The United Nations Food and Agriculture Organization designated 2015 as the Year of Soils ([www.fao.org/soils-2015/about/en/](http://www.fao.org/soils-2015/about/en/)). What does that mean for you? For me it is opening space for more people to explore and learn about soil, and hopefully in the process to also learn about the self and the sacred (sacred defined here as valued, protected, entitled to reverence and respect).

When teaching about soil, there is often a dissection into the physical, chemical and biological components. There is often an analogous dissection of the human experience of the self into the components of body, mind and soul.

The physical characteristics of soil are usually visually apparent through effects of organic matter and cultivation practices on water absorption, water retention, aeration, structure, ease of cultivation and root penetration and the performance of ground covers and crops. Similarly, physical aspects of human health in response to diet and activity are visually apparent in the skin, hair, eyes and teeth, as well as muscle and bone strength, tone and flexibility.

The chemical characteristics of soils are a little harder to see. We can learn how to observe the growth of crop plants and ground covers and relate those to nutrient intensity, capacity, balance and availability. Laboratory soil testing helps us see what is harder to quantify. Similarly, human mental aspects include oral and written communication, focus, problem solving and memory. These traits are not so visually obvious when first observing a person but can become obvious over time and measured with testing.

The biological characteristics of soil are often even harder yet to see. How do we know about the presence and diversity of soil microbes? Experience teaches us that diverse and balanced organic matter will provide diverse and healthy populations of microorganisms. We have also learned that worms, mushrooms and the fragrance of actinomycetes are sensory signs of soil biology and health. Human aspects of soul are also more challenging to measure or characterize. Healthy body and mind support connections within, to other people, to our community and to the universal consciousness. Smiles, contentment, calmness and confidence are visual symbols of soul health and indicators of freedom from fear and presence of trust and faith.

Yoga is widely understood as a culture or methods of joining together. Sometimes the joining is portrayed as a joining of dark and light, or body and mind, or the visible and unseen; but there is always some joining, some integration. Physical stretching and extending of the body opens space for the mind and awareness to move from the brain to the entire body. With the brain extended, soothed and calm, there is room for the soul to emerge. After much time and through the breath and meditation, integration occurs. The yogic tradition also includes a great appreciation for the importance of diet and Ayurvedic medicine for overall health.

Like the recovery and transitioning of uncared for soil to healthy soil, yoga practice takes time to heal the body, mind and soul. I am in the third year of one night a week group practice and occasional personal practice. The effects are becoming more and more obvious. What is also obvious is that there are many more years of infinite possibilities to grow.

A great yoga teacher, BKS Iyengar, took his last breath this past year at the age of 95. His many students and books tell the story of the yogic traditions and are contributing to the self health in much the same way organic farming contributes to soil health. In one of his books, "The Tree of Yoga", the eight limbs of yoga are illustrated with the analogy of the development of roots, trunk, branches, leaves, flowers and fruits of the tree. The underlying theme is the integration of the parts into the whole.

Is there a similar integral analogy for the soil? In recent times, the Cornell Soil Health test is an example of an integral approach that seeks to join the physical, chemical and biological components into a meaningful whole. The principles of Biodynamic Agriculture are a larger example of thinking of the farm as an integrated whole and living organism. And isn't integration the foundation of organic farming?

Building and joining soil physical, chemical and biological characteristics over many years results in bounty – bountiful crops and livestock. Building and joining the physical, mental and soul aspects of the self over many years results in health and bliss. Joining the soil and the self opens room for consideration of the sacred. Through the experience of reverence and respect, there is a foundation for protecting the soil and our food from the incomplete and

unconnected thinking that fosters ideas like pesticides and genetic engineering. Perhaps through the experience of reverence and respect there is hope for the future of organic and ecological farming?

In 2015, be open to sharing a story that joins and integrates the soil, self and sacredness. Organic farming is built on a foundation larger than soil and ecological health. It is built on a foundation of human health. Human health is much more than a good diet. Human health is celebrating our existence as an integral part of the whole.

Organic farming is integral agriculture, a marriage of sense and self, as I tried to share in my 2006 Keynote address to the Michigan Organic Conference. Eight years later I am still learning how organic farming is also a joining in the yogic tradition. Know that there is a clear and well described process for how to get where we want to go. Know that the process is rooted in discipline.

Care for our soil. Care for your self. Celebrate discipline and find bounty and bliss.

— John Biernbaum

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## Mulching and Tree Fruit Systems

Mulch is a great way to provide multiple soil benefits in tree fruit systems. It helps to keep weeds down and at the same time stimulate the soil microbial community. On my family's fruit farm, we have used both straw and hay for mulching.

Using hay as mulch is good for helping to provide nutrients such as nitrogen. When we transitioned our tart cherries to organic, we used one to two bales per mature tree, and saw good results. Studies done in organic apple systems at the Clarksville, Michigan research station showed that hay mulch can potentially provide all of the fruit's nitrogen needs (in fact, the issue was getting too much nitrogen!) Studies done at the Northwest Michigan Horticultural Research Station in Traverse City saw multiple significant soil health benefits from mulching in a study comparing multiple orchard floor management methods.

Straw is less expensive than hay but still provides carbon and helps to retain soil moisture. It also works against weeds.

One note of caution: it is best to leave any mulch about 3 or 4 inches away from the trunk. If the mulch is right up to the tree, mice will feel really comfortable hanging out there and eating / girdling your trees (causing the tree to die!) Leaving an open circle around the trunk works because mice are reluctant to be out in the open for long enough to chew on trees out of fear for predators, especially airborne ones such as hawks.

We are currently raising hay on some rented acres, which will be available to use for keeping our tree fruit acres mulched. By doing this, we hope to close in on our nitrogen and carbon cycles, as well as to keep expenses down.



Hay and straw are a fairly inexpensive soil amendment. My neighbor applies grass hay throughout the summer in his garden to help keep weeds down as well as build soil.

— Chris Bardenhagen

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## Building Soil Using Chickens and Permaculture Design

Chickens are more popular than ever in Michigan, and they have many fantastic uses for building soil in your garden or farm. Originally, my flock of chickens were providing some challenges on my homestead. When my chickens were free-ranging, they often found their way into my perennial beds and garden beds and would destructively peck and scratch, tearing up my mulch, ripping out young plants, and exposing roots. Furthermore, I was having difficulty producing enough compost quickly for my 2000 square foot vegetable garden—the soil I started with my first year was extremely poor with almost no organic matter; I wanted to build soil without spending a lot on compost. To solve both problems, and turn the destructive scratching/foraging energy into something productive, I turned to several principles from permaculture design.

Permaculture design is a design science centered on a set of 12 principles that we can use to help build more permanent, sustainable farms, homes, and communities. At least three principles in permaculture design helped me effectively solve my problems: “catch and store energy,” “produce no waste,” and “use small and slow solutions.” Applying permaculture design to the problems I was facing, I realized that I could capture the existing energy flows (me going out to the coop each day, the chickens’ pecking and scratching) to better handle my and others’ yard and food residue in a sustained way. So, I built the chickens a new, much larger run and began experimenting with “chicken composting.”

I kept the chickens in the run most of the time, but I would bring them fresh materials each day: they would get any garden residue (such as weeds I pulled) and kitchen scraps (including dairy and meat). The previous fall, I had brought in about 50 bags of leaves that my neighbors graciously raked up and placed out on the curb; I threw 3-4 bags a week into the run as well. When I went out to eat or saw leftover food that was going to be thrown away, I would bring the leftovers home and throw them in the chicken run. The chicken run became a living cold (mesophilic) compost pile—the chickens ate and processed much of what I added to the run, pooping out rich nitrogen manure, and they pecked and scratched and turned that compost over every day. What they didn’t eat quickly, drew flies, which they chased and enjoyed. The thick mat of leaves brought in earthworms, which they also enjoyed. I have found that this method doesn’t allow many weed or vegetable seeds to make it into the finished compost—the chickens will eat all seeds they can find, and if a weed does germinate while they are composting, it is eaten. As my fall bed preparation grew closer, I stopped throwing anything new into the run for a few weeks and let them finish the work on the run residue. They created a massive amount of amazing cold compost—nutrient-rich, dark-colored, fine grained, with no clumps or debris.





Fresh chicken manure is extremely high in nitrogen—so high that if you directly apply it to plants, it has the possibility of burning them. I solved this problem by adding the rich chicken-created cold compost to my fall beds after the season ended, working it into the soil, and then cover cropping it. The next spring, I had the most amazing crops and my soil tests came out much improved. Adding the compost in the fall, months before planting crops in it in the spring also ensures that no harmful bacteria or disease that might be present in the chickens gets near spring or summer crops (although bedding from an isolated outdoor chicken flock that is well fed and nurtured has little chance of containing microorganisms of concern). This chicken composting process has solved so many issues—chickens make compost much faster than a tumbler or pile could; I can conserve resources that would otherwise be thrown away; I can quickly process fall leaves; I don't have rotting

compost exposed where rodents or varmints can get at it; and I can produce the most beautiful, nitrogen-rich compost I've ever seen.

— Dana Lynn Driscoll

*Dana Driscoll is a MOFFA member, a university professor, and co-founder of the Oakland County Permaculture Meetup, a community organization dedicated to reskilling, education, and empowerment surrounding sustainable principles. Her writings on the web about spirituality, permaculture, and sustainability can be found at [druidgarden.wordpress.com](http://druidgarden.wordpress.com).*

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## Keep Your Soil in its Place!

We know the importance to keep the soil covered with a crop or some type of plant, and year-around if at all possible but planning is important. Cover crops need adequate time to grow, before being mowed and turned into the soil. Once incorporated, cover crop residues require at least 10 days before planting a crop. This insures health of the crop seedlings, as microbial processes require time to release nitrogen from cover crop residues to support crop nutrition, and allowing sufficient time also prevents root rot.

Adding organic inputs into soil improves its health, for the short and long-term. Organic matter inputs such as cover crops and compost provide crop nutrients and feed microbes to release nitrogen essential for crop production. In the long term, soil health is improved to better support crops during difficult weather periods, such as drought, excessive rains, and even high winds. But selecting a good combination to grow and still have sufficient time to plant and harvest a cash crop can be a little tricky. Organic farmers especially seek ways to keep the soil covered year-around for several reasons:

- to reduce weeds from taking over through competition
- to feed soil microbes
- to sequester (recycle) nitrogen from previous applications

- to loosen heavy soil with roots
- to add organic matter to the soil
- to hold top soil in place

Selecting combinations of inputs that work to improve the soil and feed the crops requires planning, taking into account soil test results and how your soil tests for pH and nutrients. If your soil is too acid, there are types of manure and compost that can help raise the pH. For example, poultry compost that is from egg-layer poultry farms that provide calcium to the birds can act as a liming amendment. Dairy compost can as well. However, any livestock manure that is amended with sawdust (used as a livestock bedding material or added to the compost) will generally be acidic, so it is important to know your compost maker or make your own. When you test your soil, you can also send a sample of manure or compost for testing and learn how many nutrients you are adding, as well as learn about the pH of the soil amendment.

Adding compost or manure to cover crops at incorporation is a great combination. However, to choose a cover crop it is important to fit it into your production calendar. Also, keep in mind your soil type as a guide to choosing suitable cover crops. The cover crop selector tool developed by the Midwest Cover Crop Council ([www.mccc.msu.edu/selectorINTRO.html](http://www.mccc.msu.edu/selectorINTRO.html)) is one way to identify the appropriate cover crop options, through a decision process that takes into account the goals you are seeking to address, the window of time available and the environment.

Consider planting 2 or 3 cover crop species together – for example, Austrian winter pea and oats are a good combination for early spring. Oats serve as a nurse crop to pea, maximizing soil cover and reducing the cost/acre since winter pea seed can be expensive. Choose cover crops that meet your goals as well as seed that is locally available to save on shipping, and organic seed, if possible. You can also grow your own cover crop seeds, at least some, including red clover, small grains and mustards. Keeping your soil covered will pay off for next year's crop and improve your soil for the long term, management practices that are well worth the time.

— Vicki Morrone and Sieg Snapp

*References for additional information with links:*

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## Soil, Plants and Drought / Soil, Plants and Cloudy Wet Periods

This year in managing 40 Honey Crisp apple trees organically on Fruit Ridge (Kent/Ottawa county line), a period of drought set in when the apples were quite advanced. I increased the kelp solution spray on the leaves, branches and trunk to every second or third day. This nourishment to the microbes that live on and in the tree and that do the work of life assisted them to not enter dormancy and thus put the trees into a malnutrition state. Mother trees were able to hold their apples rather than aborting them. There was a little fish emulsion in the spray, the trees being able to handle more fish in cooler weather.

Before the drought set in, there had been about four weeks of cloudy damp weather when aerobic soil microbes die or go dormant and anaerobic microbes take the field! Molds, mildew and excess fungi growth happen. The decline of the aerobic microbes causes the plants to become malnourished, weakness sets in, consequentially system failure. The clairvoyant scientist Dr. Rudolph Steiner revealed to us that the orange element silicon is a catcher and radiator of lights; 27.5% of the earth's crust is silicon but it is found only in trace amounts in plants, animals, humans, waters and in air. Thus diatomaceous earth or the biodynamic preparations Horn silica or Horsetail when applied to the plants causes a drying effect, which supports the aerobic microbial life on the plants and in the soil. In the absence of a mechanical applicator to spray the DE (diatomaceous earth) it was placed in a 5 gallon pail and hand broadcast on the trees with a smaller container. The DE does not have to cover every little surface to assist the plants in drying them out.

— Paul Keiser

*Paul W. Keiser, Agriculture and Health Alive LLC, has been a proponent of organic and sustainable agricultural principles for 60 years in countless endeavors. Teacher, writer, philosopher, farmer, public market manager, environmentalist, non-profit general manager, government official, wholesaler/retailer, he has immersed himself into all aspects of true community, mentored many, many individuals, and lit a spark of curiosity in literally thousands of lives. He is a member of MOFFA.*

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## Soil Health

Franklin D. Roosevelt said, “A nation that destroys its soils destroys itself” in 1937. Today this quote has become a very common “lead in” for lectures, seminars and in writings like this. What is remarkable about this quote is the reference to the understanding of what was happening to the soil at that time. It is very eerie in that his quote pre-dated the repeated years of dumping chemical fertilizers and pesticides on soils. Today's teachings on soil health are about bringing that nearly destroyed soil that Roosevelt warned about back to health. Successful growers are spending their resources on regenerating the soil by adding compost, manures, cover cropping, companion planting and many other concepts that begin the process of regenerating or “building” soil health. Regardless of the particular growing paradigm, (Sustainable, Biological, Organic, Bio-dynamic, Permaculture, etc.), rebuilding soil health is a major key to healthier crops, livestock and humans.

Scientists, consultants, agronomists and growers agree on cover cropping, companion planting, adding manure and composts but will argue whether soil biology or soil mineralization is the most important task in building soil health. Why argue? It is this writer's opinion to end this argument and say each of these concepts work, and together they build harmony. A soil test will determine the balance of minerals and organic matter content in the soil. For those that focus strictly on mineral balance or mineralization concepts, applying those minerals without adequate organic matter necessary to solubilize and hold them in the soil is inefficient. Some of the needed minerals can be added to the organic matter without harmful side effects. Doing this prior to spreading allows the microbes to assimilate the nutrients in their bodies and attach to the humus. This will help hold those minerals in the soil and stop them from “leaching”. The microbes will solubilize and make them available to the plant. Using “complimentary” planting concepts also helps solubilize these minerals and these concepts will



build diversity. Diversity is the key to soil health. Soil health is the key to nutrient density, disease and insect suppression, and sustainable soils.

Adding compost or vermicompost is a common practice by successful growers to build soil structure which leads to better soil health. Compost and vermicompost add a diverse group of microbes to the soil; and along with the physical and chemical properties of organic matter, are effective in building soil health. Application of 200-400#/acre is a good starting point for most soils. Making on-farm compost or vermicompost is relatively easy and a cost effective solution for adding organic matter to soils. However, if making or adding compost is out of the budget, consider adding compost tea and/or the plethora of biological inoculums on the market. Realize that having less than 2.5% organic matter leaves your microbes on a starvation diet and it is necessary to add microbe foods to stimulate activity. Foods like fish, molasses, and seaweed feed the microbes and add some of the trace minerals that seem to be lacking in most soil test reports. The benefits of adding diversity to growing operations enhances soil health. Improved soil health yields more nutrient dense fruits, vegetables, pastures and livestock.

As the next growing season approaches, consider diversifying the approach to rebuilding soils on your farm. "A nation that rebuilds its soils, rebuilds itself with a healthy population and economy!"

—Dane Terrill

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## 2015: International Year of Soils

In December 2013, the UN and its Food and Agriculture Organization designated 2015 as the International Year of Soils, and December 5, 2014, as the first World Soil Day.

In doing so, the UN recognizes that soils are the foundation of agriculture. "Soil is also the largest pool of organic carbon, which is essential for mitigating and adapting to climate change. In an era of water scarcity, soils are fundamental for its appropriate storage and distribution," said UN Secretary General Ban Ki-moon, urging all nations to pledge to do more to protect this important yet forgotten resource. "A healthy life is not possible without healthy soils," he declared.

According to FAO, at least a quarter of the world's biodiversity lives underground, where, for example, the earthworm is a giant alongside tiny organisms such as bacteria and fungi. Such organisms, including plant roots, act as the primary agents driving nutrient cycling and help plants by improving nutrient intake, in turn supporting above-ground biodiversity as well.

Better management can assure that those usually unnoticed organisms boost soil's ability to absorb carbon and mitigate desertification, so that even more carbon can be sequestered – helping offset agriculture's own emissions of greenhouse gases.



A number of educational initiatives will be pursued world-wide during the Year of Soils. For more information visit the [FAO Soils Portal](#).

— Julia Christianson

Portions of this report come from the [UN's announcement](#) of the Year of Soils.

It was a fun filled MOFFA social at the Zilkes' farm in Milan, MI (south of Ann Arbor) on November 1. Tom and Vicki Zilke hosted a wonderful tour of their farm, showing us their hoop house, gardens, equipment barn, and farm market stand. The evening was capped off with a pot luck and sharing ideas by over 20 farmers who went on the tour.

The Zilkes are vendors at several local markets and sell to local restaurants, plus have a large CSA. The Zilkes sell their produce at the Growing Hope Farmers Market, Ypsilanti Hospital Farmer's Market and the Ann Arbor Farmer's Market. Vicki showed how they used their propagation greenhouse, which was a converted above-ground pool. She took us all to the hoop house to share how plants were transplanted in for the winter. Tom used his engineering and welding skills to modify equipment. He shared his tractor, welding equipment, and unusual farm acquisitions.

The Zilkes are nearly MAEAP Verified and follow organic sustainable practices. The tour created a lot of interest among the farmers. Many of them asked when the next MOFFA Meet and Greet would be held.

— Linda Jackson



## MOFFA News

**Organic Intensives** – MOFFA, as we go to press, is finalizing our Organic Intensive Sessions for March 12, 2015. We will send a separate email flier early in January with all the details. One exciting early sneak peek: Lynn Byczynski, editor of the publication Growing for Market and author of The Flower Grower, Market Farming Success, and Fresh From the Field Wedding Flowers, along with Pooh Stevenson of Owosso Organics and Jenny Titlus of Meadowlark Farm will be presenting an all-day session Field and High Tunnel Cut Flowers for Farm Profit and Diversification – open to all flower lovers!

**Conferences** – MOFFA will be at the Michigan Family Farms Conference (MIFFS) in Marshall on January 17th. We will also have a booth at the Northern Michigan Small Farm Conference at the Grant Traverse Resort on January 24th. Please stop by and visit ... and keep an eye on

the Educational Opportunities page on our website to learn where else MOFFA will be this spring.

**Newsletter** – In January we will be deciding on themes for the 2015 newsletters. If you'd like to suggest a theme, or contribute an article for a future newsletter, please contact us.

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Keep up with MOFFA on our website: [www.moffa.net](http://www.moffa.net), or email us at [moffaorganic@gmail.com](mailto:moffaorganic@gmail.com).

Contact us at:

Michigan Organic Food & Farm Alliance  
PO Box 26102  
Lansing, MI 48909  
248-262-6826