



# JUST PICKED

VOLUME 12, ISSUE 1

February 2016

## From the Coordinator's Desk

*Happy 2016, Fruit Growers!*

Pruning is officially underway here! With our growing orchard, we start the process a little earlier every year, and this week the mild temperatures have been calling us out to get back to the trees.

After the mild start to our winter in western Wisconsin, the cold snaps and windy gray days we've had in January and February have started to make us all a little stir-crazy. Conference season is coming just in time! Getting out, talking to other growers, and making plans for the growing season feels like the perfect way to ease out of hibernation.

Beyond the practical knowledge and farming ideas from the workshops themselves, spending time with other farmers, people we might only see a couple of times a year, can give us all a boost of energy, inspire us to try new things, and help us renew our commitment to sustainable agriculture in 2016.

Our events listing at the end of the newsletter is particularly long this time around, so I won't go into more detail here, but we've got a lot to choose from this winter. I'm looking forward to seeing many of you in the coming weeks!

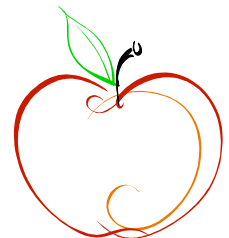


Conversation at OFGA's 2015 Field Day at Alternative Roots  
Photo by Rachel Henderson

### INSIDE This Issue :

|  |           |
|--|-----------|
| <b>Message from the Coordinator</b>                  | <b>1</b>  |
| <b>Integrating Fruit on a Diverse Vegetable Farm</b> | <b>2</b>  |
| <b>Whole Farm Revenue Protection</b>                 | <b>5</b>  |
| <b>On Farm Composting</b>                            | <b>6</b>  |
| <b>Event Listings</b>                                | <b>13</b> |

Keep up with events and other news at our website [organicfruitgrowers.org](http://organicfruitgrowers.org)!



**Have a newsletter story or idea to share?**

Email  
Rachel Henderson  
OFGA Coordinator at  
[info@organicfruitgrowers.org](mailto:info@organicfruitgrowers.org)

## Incorporating Fruit on a Diverse Vegetable Farm

By Chris McGuire, Two Onion Farm

My wife Juli and I have raised organic vegetables at Two Onion Farm in Belmont WI since 2004. Our primary market is CSA. We raise about 4 acres of vegetables, pack about 280 CSA boxes per week, and employ up to 6 full-time equivalents at the peak of the summer.

In 2012 we began planting several types of fruit with the goal of adding them to our CSA boxes. Our motivations were to increase CSA member satisfaction, satisfy our personal interest in fruit growing, and to reduce soil erosion on our sloping land by adding perennial crops. In 2012 and 2013 we planted apples, seedless table grapes, hardy kiwifruit, currants and gooseberries, pawpaws, and sour cherries.

After several years we decided to eliminate the all fruits except the apples. A main reason for this was we felt that we did not have enough time and attention to manage all of these fruit in addition to our diverse range of vegetables. Specific problems with some fruits were: grapes - too much work to manage diseases and many of the varieties we had planted were tough skinned, currants - too much work to harvest, gooseberries - heavy disease pressure, pawpaw -poor winter hardiness in 2013-2014, sour cherry - disease pressure and too much work to harvest. We have retained the apples because they have grown and yielded well, there is a wealth of information on organic apple growing, and because they are a popular food with a long harvest and storage season.

We are continuing to plant apples and by 2017 we should reach about 600 trees, which we expect will be our stable orchard size. We will have 1 acre of apples and 4 acres of vegetables. We raise only scab-resistant varieties on dwarfing rootstocks (primarily G. 11, G. 16, G. 41, Bud 9). We are using a shortened vertical axis training system, with trees spaced 6' apart and trained on individual tree stakes from Best Angle company. We have drip irrigation in the orchard. We use many organic pest control products and we are learning to use scouting and pest monitoring to time our spraying effectively.

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Orchard rows at Two Onion Farm, Belmont, WI  
Photo by Chris McGuire

## Incorporating Fruit on a Diverse Vegetable Farm

*Continued..*

We have learned a few horticultural lessons:

- Weed control under our dwarf trees is challenging. We started out hoeing a bare strip in our tree rows, but this was very time-consuming. We did not realize initially that the soil underneath the trees would become very hard and difficult to hoe without the annual tillage which our vegetable plots receive. Our crew hated hoeing the apples because of the hard soil. I hated it too. After several years we switched to hardwood bark mulch in the tree rows (hardwood bark does not encourage rodents), combined with tractor cultivating a narrow bare strip between the bark and our sod aisles to prevent grass and clover from growing into the mulch.
- Our tight tree spacing (6x10.5') has been difficult to manage on our highly fertile soils. More vigorous varieties tend to exceed their space.
- We are glad that we staggered our tree planting over several years because it spread out work and because it allowed us to learn lessons in tree training and variety selection from our earliest plantings which we could apply in our later plantings.
- Insect and disease problems have thankfully been modest. Current main challenges are potato leafhopper ( a surprise for us), cedar apple rust, and plum curculio. We are in an open area with few wild hosts for many apple pests and I believe this has been beneficial.

Apples require a lot of management attention and it has been difficult to add them to a farm which already requires a lot of management and attention. This is especially true in late spring and early summer when pest monitoring, spraying, and training and pruning young trees requires a great deal of management. On our farm it has been vital to add an employee packing shed manager in the past few years who manages many day-to-day responsibilities in vegetable post-harvest work and thus frees up farmer-owner time for scouting and spraying apples.

With regards to management time, I feel that our decision to raise only scab-resistant varieties was a good one because it removes one major management headache. Many of the scab-resistant varieties have excellent flavor: Pristine, Sansa, CrimsonCrisp, Priscilla, Winecrisp, Sundance, Goldrush, Scarlett O'Hara, and Pixie Crunch. My taste tends toward apples with complex flavor profiles and a good mix of sugar and acid, and texture is not super important to me; I would rate many of those varieties as first rate. However some of our CSA members have objected because our varieties are not Honeycrisp...

There is little overlap in labor tasks between apples and vegetables. This complicates labor management and training. Most vegetable crops requires a shared set of skills like transplanting, hoeing, and hand weeding. Apples require different skills such as fruit thinning, pruning, and tree training. We have to train workers on these apple skills each year which adds stress and time to our busy lives.

Apples have required some equipment and facilities which we did not previously have on the farm:

- Airblast sprayer
- Additional walk-in cooler (because we cannot mix apples and veggies in storage)
- Narrow tractor and narrow flail mower – these were only necessary because we spaced our apple rows too close (10.5 feet apart) and our existing tractor (5.5 feet wide) would not fit down the rows when trees were grown. We now have two tractors, and we do use our new narrow “orchard” tractor in our vegetable fields as well as in the apples.
- Narrow wagon with sides for hauling and spreading bark mulch.
- Cultivator for cultivating sides of mulch



## Incorporating Fruit on a Diverse Vegetable Farm

*Continued..*

In 2015 we distributed small amounts of apples along with vegetables in our CSA boxes. Most members responded positively although a few disliked our selection of varieties and more simply just did not want apples. Although apples are a popular fruit in our society, we had to realize that in the past people have chosen our CSA because of our vegetables and not all of those people would want apples from us. We are offering our apples this year as an optional add-on to our vegetables and we expect that 60-80% of our members will choose the apples.

Overall: from a financial perspective we would likely have been better off investing in increased vegetable production rather than apples. Although we expect the apples to be profitable, they have a slow return on investment and they required a costly initial learning curve and additional equipment investments. Expanded vegetable production would have been less costly and less stressful. However we find growing and eating apples very rewarding and they will add value to our CSA for many of our members. I would only recommend the apples to other diverse vegetable growers if you have a strong personal interest in growing apples.

I also believe that we have had much more success growing apples now then we would have had if we had started growing them along with our first vegetables twelve years ago. Although apples do require different skills than vegetables, there are skills such as soil management, equipment operation, and labor management which we learned from vegetable growing and which we could apply to our apples. And it's less expensive to learn those skills by growing vegetables, because you can replant, wipe the slate clean, and start anew every year.

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## Winter Orchard Views



*Above: Fence still charging in the snow!  
Photo by Anton Ptak*

*Left: Firewood and orchard in the winter  
Photo by Rachel Henderson*

## Can Whole Farm Revenue Protection Help Your Orchard Business?

By Rachel Henderson, OFGA Coordinator, Mary Dirty Face Farm

For many fruit growers, crop insurance seems like one more thing on the list of advantages we don't have access to. Unless we sell large volumes of apples on a wholesale level, the USDA simply hasn't had a product available. (For more on how crop insurance has been used as a system for benefiting large farms to the exclusion of small and beginning farms, The Land Stewardship Project has a series of papers on the subject. They can be downloaded from their website: <http://landstewardshipproject.org/organizingforchange/cropinsurance>.)

Small orchards that direct market all or most of their fruit have often relied on diversified revenue streams (including off-farm income) to protect us against extreme weather events and crop failure. However, as those extreme weather events become more and more the norm in our growing seasons, the risk inherent in agriculture becomes harder to stomach.

In 2015, the USDA introduced Whole Farm Revenue Protection, a program that replaces the previous, and under-utilized, AGR (Adjusted Gross Revenue) and AGR-Lite programs. As its name suggests, the program offers insurance for your farm's income, rather than for individual commodities. This has a distinct advantage for market growers, as even organic price adjustments (which are only available in some states and counties) in commodity insurance policies may fall short of the prices we get for direct sales of produce.

Other advantages in the new WFRP program include:

- Better premium subsidies, with increased subsidies for increased diversity of crops (up to 7). We have known all along that growing multiple crops makes us more sustainable farms, and now we can get some credit for it!
- Option to get coverage for expanding operations, up to 35% increased revenue in a given year. This is important for growers establishing new orchards, when we expect (or hope for) increasing revenue every year, so that insurance coverage wouldn't be limited to the previous years' average. The option can also be used when transitioning from conventional to organic.
- While applications generally require 5 years of Schedule F (or substitute form) records, those who qualify as Beginning Farmers (under USDA guidelines) need only provide 3 years. Beginning Farmers can also receive higher premium subsidies.
- WFRP is available in all 50 states in 2016, an improvement over last year.

In the January-February edition of the Organic Broadcaster, Harriet Behar of MOSES provided an extensive overview of the program, including information on how to get started. Read the full article at <https://mosesorganic.org/crop-insurance/>. She and two others will be presenting on the topic at the upcoming MOSES conference -- Finally! Diversified Grower Crop Insurance; Friday 11:00 am -12:30 pm -- and a webinar that MOSES co-facilitated in January is available archived on their website, <https://mosesorganic.org/events/webinars/>

The webinar is divided into three parts -- the first gives a lot more background information and an understanding of the parameters of the program. The second part really dives into the details of estimating your costs and potential benefits, and the third was dedicated to answering questions. In addition, USDA's Risk Management Agency provides an online calculator (<http://ewebapp.rma.usda.gov/apps/costestimator>), where you can estimate how much coverage you could receive at various premium levels, and what the actual cost would be to you as a farmer. The RMA site also has recordkeeping templates available for download, and can direct you to local insurance agents that work with RMA.

*Details in this article were reprinted with permission from the MOSES Organic Broadcaster*

## On Farm Composting

By Harry Hoch, Hoch Orchard

### One Size does NOT fit all

Composting can mean different things to different people. I have heard some say “if it is not heated and turned five times it is not compost”. While that may be the definition of certified organic compost, it is not exactly a true statement. People have been making compost a little longer than the National Organic Program has been around, and the NOP defines one type of compost. From a backyard heap of kitchen scraps to thousands of feet of neatly windrowed material, it is all compost in my opinion.

Like winemaking, composting can be as simple or as complicated as you want it to be. To make wine all you need is fruit juice and some way to stop air from getting to the juice. That’s it. Just let yeast convert sugar to alcohol in the absence of oxygen. Yeast is an anaerobic organism. It does not like to be out in the air. A gallon cider jug with a balloon stretched over the mouth of the jug can make a nice farmhouse wine. Not the best wine, but it is wine. This wine may be best served with a hot dog and potato chips on a picnic table in the middle of the summer, in its place it can be fantastic. Some may say it is not wine if it is not made from fine French grapes. Again, I disagree. While a \$50.00 bottle of Pinot Noir can be great with a steak dinner, it is not going to add a lot to the hot dog and chips. Different wines for different occasions. Different compost for different conditions.

### The Basics

Composting is a simple process. We want to take raw organic materials and convert them into stable humus-forming material that can be added directly to your gardens, orchards, berry beds, or fields. Each situation will benefit from composting, but there is not one type that is best for all uses. Raw organic materials, being vegetable matter, woody material, manure, and waste from processing meat, can be given back to the earth and improve the soil. But in their fresh form they are unstable and can damage plants, spread disease, or leach into the ground water. These materials can rot, ferment, and break down into some pretty nasty products.

Composting uses heat from thermophilic bacteria to heat the pile of organic matter. Think of this as a gentle cooking and softening of the material. The heat helps break down the simple sugars and gets all kinds of other microorganisms going. After the most unstable parts of the compost are cooked out (by bacteria) the material cools allowing other organisms like fungi, soil protozoa, and larger invertebrates (earthworms) to work on the cellulose and lignin. This is the tough stuff like corn stalks, straw, sawdust and tree trimmings.

To make good compost you need a good combination of carbon containing ingredients and nitrogen rich ingredients. These materials have to be mixed or layered and given enough water to wet all parts but not saturate. Composting utilizes aerobic bacteria and fungi to degrade the material. That means they work best in the air, not under water. This leaves rich smelling brown crumbly compost that is easy to work with. Too much water or heavy compacted piles restrict the airflow and make a better environment for the anaerobic organisms. Yeasts will create alcohol and anaerobic bacteria will make putrid smelling products that are not good for your plants.



Left: Turning compost at Hoch Orchard; Above: Compost piles in action  
Photos by Harry Hoch

## On Farm Composting *Continued...*

### A controlled slow burn

When making compost you can control the rate of decomposition in a few ways. The ratio of carbon to nitrogen will have a strong effect on the heat and rate. Water can be used to cool down an overheating pile or warmup a slow dry pile. Turning the pile will increase the oxygen, mix up the material and stimulate the bacteria; or allow heat to blow off in the process and cool down the pile.

### Heat

Heat is important in composting. High heat can be good for some and bad for others. In general, the hotter the pile the quicker the decomposition. In fact, you can get a pile so hot that it can burst into flames. The generalization still holds true, a fire will break down your materials very quickly, but the ash-filled over-cooked compost will not be of good quality, especially if the fire department hoses it down. Heat can also help sanitize your compost. Many human pathogens cannot survive heat above 140 degrees Fahrenheit. This is why food scientists are always telling you to keep your serving temperatures above 140 degrees. If you can get your compost pile above 150 degrees you will kill off most of the pathogens that you can find in manure and spoiled foods. On the other hand, the high temperatures will drive off earthworms and other critters that help turn the pile and add life to your compost. If you are trying to produce fungal-dominated compost that is good for woody plants and trees, the high heat will kill all of the beneficial fungus and even kill some of the spores.

### Water

Regulating water is very important to the compost pile. You never want to place your pile in a low spot that has standing water, or in a place where there is excess run off falling on the pile or into it. On the other hand, the organic material will break down very slowly if it is too dry. A general rule is to take a handful of compost and squeeze it hard. If you can get some water to drip out between your fingers you are in good shape. If water runs down your arm you are too wet. If you are using a hot composting system in the hot dry part of the summer you may have to add water regularly. The heat on the inside of the pile will increase evaporation and the sun and wind can dry out the organic matter deep into the pile. If you have a very hot spot that is covered by sunbaked mulch, a fire can be the result. One way to reduce the drying of the pile is to use a cover. There are compost covers that you can buy, but a layer of wet hay, brush and leaves, sawdust, or even topsoil will help control the moisture and temperature of your pile.

### Carbon Nitrogen Ratio

The carbon to nitrogen ratio of the material in your compost pile can affect the temperature of your pile and the rate of decomposition. The experts say you should have about a 30:1 carbon to nitrogen ratio in your compost pile. Some materials are high in nitrogen, this gives you too low of a C:N ratio. Any green material usually falls into this category. Kitchen waste, garden weeds, lawn clippings and the like. Fresh manure is also high in nitrogen. These materials are often wet and will compact easily. They will also heat up quickly. Without some low nitrogen material mixed in, you may not be able to control the heat.

Materials low in nitrogen will compost slowly and may never achieve the heat you want. Dry leaves, straw, wood chips, and paper are good examples of materials with a high C:N ratio. There are many composting manuals that you can find that will give you very specific recipes of how much of each material to put into your pile. To give you an idea of C:N ratios, here are a few numbers from a chart in *Creating Humus on the Farm* by Roland Ulrich:

|                 |        |
|-----------------|--------|
| Paper           | 1000:1 |
| Old sawdust     | 500:1  |
| Wheat straw     | 100:1  |
| Grass cuttings  | 25:1   |
| Cow manure      | 20:1   |
| Chicken manure  | 15:1   |
| Vegetable waste | 13:1   |



## On Farm Composting *Continued...*

### Methods of Composting

I am going to outline a few different methods of composting. This is not meant to be a guide on how to compost. I have summarized content from other publications for comparison. Find a composting guide or buy one the books referenced if you want to read more about each system.

#### *Hot composting*

This is what most people think of when making compost. The pile is mixed with plenty of green material giving it a good shot of nitrogen to get the thermophilic bacteria off to a quick start. The pile will heat up over night with the internal temperature exceeding 150 degrees. If it starts to approach 170 degrees the pile is turned or watered. This system sanitizes the compost. Commercial windrow machines will turn the outside in and the inside out making sure all parts of the pile have taken a turn in the center of the pile after five turns. Turning with a fork or a tractor loader requires more care in turning. A good rule of thumb is - the top becomes the bottom, the sides get scraped off and thrown to the middle, then the hot middle portion is used to cover the pile. This is the quickest way to make good quality compost for the garden and annual crops. There will be little fungal development because of the high temperatures and frequent turns. Bacterial dominated compost is a good general purpose compost.

#### *Cool composting*

This is the cheapest and easiest way to make moderate volumes of compost suitable for fields, pastures, and perennial fruits. Newman Turner describes this system in his 1951 book *Fertility Farming*. Turner was a pioneer of the sustainable agriculture movement and organic farming in the UK. He wrote this book in the period after WWII when farmers were quickly moving away from traditional farming methods toward industrial agriculture. Tractors were small, farm fields were only a few acres each, and horses still had a place in farming. Skid steers and tractor loaders were not common so compost piles were built, turned, and loaded with a fork.

Turner describes this method in a section of his book titled 'How to make Compost without Turning'. This is a type of static aerated pile. He begins the pile with a base covering a ten foot by ten foot square with brush and brambles that were cut when maintaining fencerows. The branches are loosely piled up a about a foot high. A layer of fine material like straw or hay is placed over the branches to keep the subsequent layer of manure from filtering into the brush. Then farm waste materials are layered until the pile is about six feet tall with the top being about six feet by six feet. He piles just about any kind of waste material you can imagine from a diversified farm. Each layer has three inches of manure on top of it. The entire heap is then covered with an inch of topsoil followed by three to six inches of sawdust or straw. Care is taken not to step on or compact the pile, allowing plenty of airflow during the initial heating. The pile will slowly settle but this will take place after the first burst of heat from the manure and green plants. These piles are usually located in an odd corner of the field and allowed to decompose for at least six months if not more. When it is time to spread the compost, the straw or sawdust covering is used to start the next pile. This covering will be weathered and partially broken down, plus it will have weeds growing out of it. All of this is thrown on top of the next brushy base. After the rich compost is spread, any un-decomposed branches (that are full of fungal strands) are thrown into the new pile.

This type of compost will have a nice balance of bacteria and fungal strands. The pile was created with raw manure and possibly kitchen waste. The odds of E. coli, listeria, or other human pathogens surviving in this old heap are pretty slim, but remember, it did not go through a sanitation phase so it is best used on late harvest fruit crops or fields producing animal feeds.

#### *Biodynamic Composting*

There are many techniques that can be used to create biodynamic compost. The use of biodynamic preparations to inoculate the pile is what really distinguishes this method. Ehrenfried Pfeiffer wrote a very good book on biodynamics titled *Soil Fertility Renewal and Preservation*. He uses the analogy of bread making to composting. He claims you can make bread by mixing flour and water and then letting the warm mixture sit out to be inoculated with bacteria and wild yeast floating in the air. This will ferment and make dough that can be formed and baked, but it will most likely create a hard bitter bread. To make a proper bread you need to use a proper yeast. Farmers often go about making compost as in the former example.



## On Farm Composting *Continued...*

Dr. Rudolph Steiner described preparations in a series of lectures in the early 1920s. These preparations are created using knowledge that developed over thousands of years by traditional subsistence farmers. They are made of decomposed herbs that hold microorganisms that stimulate proper composting. Chamomile, valerian, nettle, dandelion, horsetail, and oak bark are some of the ingredients used in the preparations. Most are fermented or aged in a specific way and then held for a period of time in the ground. Some are packed into animal organs which act as a membrane to allow certain organisms into the herbs. The herbal contents turn into a type of fine humus. These preparations are then added to the compost pile. In his book, Pfeiffer shares the composting techniques he developed over decades of field research with composts, manures, and compost teas.

### *Controlled Heat Method of Composting*

This method is a modification of the older biodynamic method of composting. This system is intended for medium to large scale on-farm composting. Piles are formed with a tractor or skid steer loader and turned using a specific pattern. It is not intended for large commercial windrow systems using turning machines. You can learn the details of this system in Roland Ulrich's booklet titled *Creating Humus on the Farm*. This system utilizes lower temperatures and regular turns to help control the highs. This allows for more diversity of life in the compost and mineralizes a higher percentage of the nutrients than hotter, faster systems. A compost cover, running water nearby, and a bucket loader are needed to keep the pile in the proper temperature range. The system includes three phases:

#### Preliminary phase

The first phase allows the compost to heat up into what Ulrich calls the *mesophile range* of 95 to 113 degrees and then into the *thermophile stage* of 120 to 140. After six weeks this fresh compost is still active and must undergo the transition to maturing compost.

#### Conversion phase

At the conclusion of the thermophile stage the easily degradable substances are broken down and the pile goes into a second mesophile stage where temperatures drop from about 122 to 95 degrees.

#### Up-building phase

This is the phase Ulrich refers to as the final fermentation, where temperatures fluctuate between 86 and 104 degrees. This phase will take 16 to 20 weeks and allows fungi and other organisms to break down the lignin and cellulose.

This system can produce a very high quality balanced compost but it will require some expensive equipment and five to six months to finish the process.

### *Certified Organic Composting*

According to the NOP, compost made of manure, animal products, or a combination of them requires heating to sanitize the compost. If the compost does not reach the required heating then it can still be applied to organic crops, but it will have to follow the manure application rule which restricts application to no less than 120 days before harvest of crops that are in contact with the soil and 90 days for crops above ground.

According to NOP rule 5021 in-vessel or static aerated piles must hold the temperature between 130 and 170 for three days. In addition the temperatures have to be logged and the entire process has to be described in your Organic System Plan. The source and type of materials have to be documented and the system will have to be inspected. For windrowed compost systems the compost has to remain between 130 and 170 degrees for 15 days and the pile has to be turned five times.

## On Farm Composting *Continued...*

Certified organic farmers should always check with their certifier before applying compost. Even if you made the compost with organic inputs from your farm, you need to have the process pre-approved if it contains any animal products. If you apply an animal based manure to your garden and it did not meet the standards, or was not properly recorded, the raw manure rule will apply to your compost. There are a lot of inspectors and certifiers who are scared to death of microorganisms and potential food contamination. They will not hesitate to cancel your certification on crops harvested before the 90 or 120 day harvest interval.

### **Feedstock for your compost**

#### *Plant based compost*

You can make good quality compost using only plant based feedstock, but a little bit of manure will add a huge amount of diversity to the microorganisms in your compost. Cow manure is especially good for the soil since these ruminants evolved in a prairie system. The plants feed the grazing animals, the animals digest the plants with vast array of microorganisms in the rumen and intestines. Then the animals drop manure on the ground adding more microorganisms to enrich the soil, keeping the cycle going. I suggest getting a small amount of ruminant manure to inoculate your compost pile. If you do not have access to any manure use a compost starter or a compost tea starter to increase the biodiversity in your pile.

#### *Manure based compost*

In my opinion manure is the best feedstock for making a biologically active compost. The digestive system of grazing animals is what completes the link in the cycling of nutrients through the environment. The problem with manure based compost is the fact that manure can contain human pathogens. The risk of healthy animals producing manure that is laden with pathogens is low. The risk of the small amount of pathogens in that manure surviving the competition of millions of aerobic microorganisms in a vibrant compost system is even lower. Never the less, regulations are moving toward more and more controls on the use of manure.

#### *Woody fungal-dominant compost*

While prairie soils are known to naturally have bacterial dominated soils, forests create soils that are more fungal dominated. Most perennial fruits evolved in forest or forest edge environments. Soil that reflects a forest is going to be better suited to fruit production than soils of the prairie.

Fruit growers can produce a great fungal compost by piling up logs and covering them with soil and mulch. If possible, get a few pails of soil from the middle of a woodlot with old deciduous trees. This soil should be full of fungal strands that are adapted to forest conditions. Keep the pile moist and just let the fungus do its work. It may take several years to break down the logs, but eventually you will get crumbly musty chunks of decomposed logs that can be added to conventional compost piles or applied directly to your fruit plantings.

### **The Role of Compost at Hoch Orchard**

We use compost more as an inoculant than as a source of organic matter. Compost is one of many tools we use to strengthen the soil. Some farms bring in hundreds of tons of material in order to compost it and add organic matter to the soil. I don't agree with the concept of using fossil fuels to haul truckloads of compost material to your farm. Composting should be done with materials already on the farm.

We primarily use compost in the plantings of annual grains and vegetables. Our perennial fruits are planted in systems that have a mix of plants on the orchard floor that produce organic matter along with the dropped leaves and prunings from the fruiting plants themselves. We are actually composting in place in the perennial areas. We apply compost to orchards, berry beds, and tunnel plantings before they are planted. This gives the soil a boost before our mix of plants get established.

## On Farm Composting *Continued...*

### *Soil Fertility*

We look at soil fertility from a biological perspective. After many years of soil testing and adjustment of macronutrients we have moved away from the concept of soil chemistry. Soil is not a mix of inert granules that simply supports the plants and holds the nutrients for the roots to feed on. Nitrogen, Phosphorous, and Potassium (NPK) don't come from a bag or a compost heap in nature. The fungi, bacteria, and soil protozoa work together to take nitrogen from the air and extract nutrients from the minerals in the soil particles and rocks. Mycorrhizal fungi have evolved with plants in symbiotic relationships. The right fungi can live on, or in some cases, actually penetrate plant roots. The plant roots ooze sugars for the fungi to take up. The fungi in return dissolve the surrounding rocks and minerals into a soluble form and put them in the plant root zone where they can be directly absorbed by the root hairs. For those interested in this aspect of soil biology you can find much more on the topic in a great book titled *Teaming with Microbes* by Jeff Lowenfels and Wayne Lewis. This book does NOT read like a biology text; it is interesting and well written.

### *Soil Deficiency*

Deficient soils are not lacking in micro and macro nutrients. Soils are made of rocks, sand, and clay. These are minerals. All the P, K, and micronutrients are already there! They are just not in a form that the plants can access. Soil tests don't tell you the make-up of the rocks in the soil, they just tell you how much of a specific nutrient is in a plant-available form at the time of the test. What deficient soils are lacking is the proper balance of microorganisms that are matched to the crops you are attempting to grow.

Unfortunately there is not a guide book that can help you match the organisms with your crop and there is not a farm store that can sell you bag full of the organisms you need. Soil ecologists are just beginning to understand the intricate interactions among the soil organisms and plant roots. Studying the interactions of these microorganisms is not as easy as testing the levels of soluble forms of nutrients, and there is not a lot of published information on these interactions. Many of the fungi in the soil have yet to be identified and fully understood. Some actually require multiple species of plants to interact with. If the right mix of plants is not growing in the soil, the fungi will not be able to survive. Without the fungi the nutrients are not put into a plant available form.

You can force your plants to grow in a poor soil by analyzing the micro and macro nutrients, and then apply concentrated synthetic fertilizers in the prescribed amounts. The fertilizers are in plant available form and will go into suspension when the soil is wet allowing the plants to absorb them. Of course most of these fertilizers are in the form of a salt which is toxic to most of your soil microorganisms. Compost has low levels of plant available nutrients but high levels of microorganisms that can put the nutrients into a plant available form. Attempting to analyze your compost and use it to increase your nutrient levels according to a chemical soil analysis is not going to work.

Improving the quality of a deficient soil can NOT be done with a soil analysis. Attempting to measure the amount of nutrients in your compost so you can carefully measure out the right volume to be applied at the base of your plants is the wrong mindset. We are not setting out a picnic lunch for our crops to feed on. With composting we are trying to adjust the life in the soil to be better adapted to the crop. The organisms in the soil are much better suited to feed the plants than we are. Compost adds a huge array of organisms that will self-select for the crop you are attempting to grow. If you have compost that is made up of many types of organisms some will thrive in your soil and some will fade away because they are lacking the proper host plants to sustain them. The plants will work with the life in the soil to extract the nutrients they need.

We have to create different types of composts that have a wide diversity of soil organisms. We then have to attempt to grow our crops in systems that have a wide diversity of plants growing together. We just have to hope that we get the right balance in the soil. The more diversity in both the compost and the plant selection, the better chance we have of getting it right.

## **On Farm Composting** *Continued...*

### **Making Compost at Hoch Orchard**

We raise a few hogs, sheep, and poultry on our farm. These animals are overwintered in sheds and small shelters. The winter bedding is what we use as the base material for our compost. Our bedding is primarily hay but it also has urine and manure mixed in. It can also have silage and apple cider pumice left over from feeding the pigs and sheep. It is very difficult to judge the nitrogen volume in this bedding so making the perfect nitrogen and carbon ratio is a challenge. The bedding can also be variable in its moisture content. If we pile the bedding outside during wet weather it can be saturated, or if comes right from the pen it may be a little dry.

We wait to construct the piles until there is some green material to mow in the orchards. We have an old 1950s era green chopper. This is a type of flail mower with a big hood that directs the chopped grass up and into a wagon. I take this fresh chopped green grass and layer it with the animal's bedding. With the help of an intern or two we pitch a layer of the green chop off the wagon and onto the pile. Then with the tractor's front end loader I scoop a couple of buckets of old bedding onto the pile. The pile covers about a ten foot diameter circle and we keep building up layers until the pile is about 8 feet high.

### *Inoculating the Pile*

A few weeks before we make the piles I will start a couple barrels of compost tea brewing. I brew the tea in an unheated shed at the ambient temperature. I do not heat the tea. I like to use some BD Prep 500 (horn manure) and some Pfeiffer compost starter as inoculant in my tea. I may also make a barrel of tea using some of last year's compost or some commercial compost. The more sources of compost the more diversity that will be in the tea. I will brew two or three 55 gallon drums of tea with my homemade aerator/mixer that uses air from a shop compressor. I feed the tea about a quart a week of fish hydrolysate and untreated molasses. When we build the compost piles I use a small transfer pump and garden hose to spray down each layer with a couple gallons of tea. After the pile is completed we cover it with a layer of green chop or hay.

### *Measuring the Temperature*

I have a 36 inch compost thermometer that we can push deep into the pile to monitor the temperatures. I usually have an intern check the pile every day and log the temperature until the pile starts to cool down. We make several piles and I will turn them a few times with the tractor's loader if they get too hot or seem to be slowing down. We usually have at least one pile that will sustain the required temperatures to achieve the sanitation stage required in certified organic compost. I have my inspector look over the records, and verify the system and the piles that were hot enough.

### *Using the Compost*

The piles that reached the required temperatures can be used to side dress vegetables throughout the spring or be held to make next year's potting soil. The other piles will be nicely composted by fall. We load that compost into our old beat up manure spreader and apply it to the gardens and field plots in the fall. This way we easily achieve the 90 or 120 day to harvest interval required by the NOP.

Our old manure spreader does not have a beater bar in the back that breaks up and throws the compost over a large area. I just drive back and forth over the plots letting the compost fall out the back of the spreader in clumps and piles. After all the compost is spread I go over the plots with a light disc or shallow digger to incorporate the compost a little bit. This is a very unscientific method of application. I do keep track of how many loads goes on each plot, but I do not have a formula. I may use a little more on newly turned sod and a little less where the soil was nice.

I have been using this method on a couple acres of vegetables for two seasons now. In 2015 we did not apply any commercial compost or side dress the vegetables during the season. I was a little concerned that my soil would not be able to supply enough nitrogen for the all the different vegetables that we grew. But the garden looked as good as it ever had and I saw no signs of nitrogen deficiency.

Hopefully this article will help you make decisions about the compost system on your farm. We certainly don't have all the answers yet, but we will keep trying to figure out the right questions to ask.



## Events!



### Organic Fruit Growers Winter Retreat

February 24<sup>th</sup>-25<sup>th</sup>. Trempealeau, WI. OFGA will host a retreat for in-depth discussion and presentations on topics of specific grower interest, preceding the MOSES Organic Farming Conference. Registration closed at this time.

### OFGA Annual Meeting

Thursday, February 25<sup>th</sup>, 5:30-7:00 pm

The Root Note Cafe, LaCrosse, WI

Paid membership is not required to attend the meeting, but only current members may vote or run for board positions. There are no issues before the organization for member voting at this time, though there will be one board position open. At the meeting, we'll re-cap 2015 and discuss priorities and activities, including field days, for 2016. Please come with suggestions!

### OFGA Scionwood Exchange

Friday, February 26<sup>th</sup>, 6:00-8:00 pm, at MOSES Conference, LaCrosse, WI

Bring scionwood or cuttings from your orchard to share, and spend some time talking fruit with OFGA board and members. Open to anyone at the conference (registration required).

### Cider Tasting

Friday, February 26<sup>th</sup>, 5:00-9:00, LaCrosse, WI

Radisson Hotel, Mississippi Parlor room #823

Hosted by OFGA and Hoch Orchard, for hobby and pro cider makers. Hoch Orchard will have samples of their apple and apple/fruit blends to try. This is a private event with no sales. Bring your home brew and find out what others think.

This event is organized to coincide with the MOSES conference, but conference registration is NOT required to attend. The Radisson is next to and attached by indoor walkway to the conference center. It should be entirely reasonable to attend both this event and the scionwood exchange, if you so choose.

### MOSES Organic Farming Conference

February 25<sup>th</sup>-27<sup>th</sup>. La Crosse, WI. Workshops of interest to fruit growers include:

- Organic Vineyard Table & Wine Grapes; Judith Reith-Rozelle, Stonehoe Consulting  
Saturday 8:15 a.m.
- Organic Pest Management in Fruit Crops; Matt Grieshop, Michigan State University and Jim Koan, Al-Mar Orchard  
Saturday 3:30 p.m.
- Small Scale On-Farm Composting; Harry Hoch, Hoch Orchard  
Saturday 3:30 p.m.
- The Pastured Pig's Perspective, Steve Deibele, Golden Bear Farm  
Friday 8:15 a.m.
- Diversified Grower Crop Insurance; Roxann Brixen, Great American Insurance, Harriet Behar, MOSES and Margaret Krome, Michael Fields Agricultural Institute  
Friday 11 a.m.

*Continued on next page....*

## **Classes and Workshops at Clover Valley Farms, Duluth, MN**

### **Cooking with Gourmet Fruit Vinegars** Tuesday, March 8th, 2016, 6-8pm, Fee \$20 owners/ \$25 non-owners

Cindy Hale of Clover Valley Farms & Vinegary will explore ways that you can use culinary fruit vinegars to enhance the flavor, enjoyment and healthfulness of foods & beverages. You will leave with a recipes and ideas for your own kitchen and inspiration to spare. All items served will be gluten-free.

Call 218-728-0884 to register with Whole Foods Coop, Duluth, MN

### **The Making of Vinegars** Thursday, March 3rd, 2016, 6-8pm, Fee \$25

Cindy Hale will give a quick introduction to the different type of vinegars (i.e. white distilled, Balsamic, Wine and Cider Vinegars, etc.), how they are made and their different characteristics. You bring an unopened bottle of wine and an empty, clean a quart-sized canning jar. She will provide the bacterial “mother” and an easy to follow procedure for culturing your own homemade and healthful vinegars.

Call 218-722-8799 to register with Blue Heron Trading Company, Duluth, MN

### **Restorative Apple Tree Pruning** Sunday, February 28th, 2016, 3-5 PM Fee: \$20 per person

Learn about the tools and techniques for restorative pruning of older fruit trees to improve their health and fruit production. Appropriate for participants of all skill levels, the class will include hands-on demonstrations. Bring what pruning tools you may have and pictures of your trees to discuss, time permitting. All required tools and handouts will be provided, dress for the weather!

Location: Zion Lutheran Church, 1000 Washington Ave, Cloquet, MN 55720

Questions & to Register: contact Cindy Hale at 218-461-2996 or <info@clovervalleyfarms.com>

### **Pruning and Training Young Trees** Saturday, March 5th, 2016, noon-2 PM Fee: \$20 per person

The first few years of a newly planted fruit tree’s life set the stage for its long term health. Learn about training young fruit trees for optimum health and production as they mature. Appropriate for participants of all skill levels. All required tools and handouts will be provided, dress for the weather!

Location: Clover Valley Farms, 6534 Homestead Road, Duluth MN 55804

Questions & to Register: contact Cindy Hale at 218-461-2996 or <info@clovervalleyfarms.com>

### **Fruit Tree Grafting for Beginners – indoor bench grafting** Thursday, April 14th, 2016, 6-8 pm

Propagate the old family apple tree by learning how to graft it onto a new root! Course fee includes all supplies (handouts, grafting bands, sealant, etc.), one semi-dwarf rootstock and a selection of non-patented scions. Each student should bring a sharp, straight bladed knife (some will be provided for use during the class), good fitting leather gloves recommended. Bring your own “scion” wood if you have some. A “scion” is a 1-2 year old twig, the longer the better, cut directly before class. Keep scions moist by putting them in plastic bags with moist paper towels.

Location: Cook County Community Center, 317 W. 5th Street, Grand Marais, MN

To Register: call Diane Booth, U of M Extension, Cook County Office 218-387-3015

Fee: \$10 fee, includes all tools & materials, one rootstock and a selection of scions. A limited number of additional rootstock will be available for \$5-10, please indicate if you want additional stock at the time of registration (to keep the workshops affordable they are partially supported by a grant from the MN Department of Agriculture, Sustainable Agriculture Demonstration Program)

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## Events!

### **Commercial Tree Fruit Pruning Workshop**

March 4<sup>th</sup> 9:00-3:00

Morning workshop at Menomonie Market Food Co-op,

Afternoon demonstration at Mary Dirty Face Farm, Menomonie, WI

Registration fee is: **\$15 Per Person**, \$10 for additional attendees from same farm

This provides one set of materials per farm, lunch, and refreshments for the day long workshop.

Learn Fruit Tree Pruning and Training as it relates to flower bud initiation and formation on Sour Cherry, Plum, Pear and Apricot fruit trees in this day-long educational workshop, which will include a morning classroom session followed by an afternoon hand's on pruning demonstration. Several Brambles, including red and black raspberries will also be covered. Tree Fruit Orchard Hobbyists are welcome to attend this workshop.

For more information contact Heidi Doering, St. Croix County Horticultural Agent  
heidi.doering@ces.uwex.edu 715-531-1930

### **The Good Food Festival & Conference**

March 24th-26th, UIC Forum, Chicago, IL

More info and registration <http://www.goodfoodfestivals.com/>

Greet spring and celebrate our region's growing local food community! The 12th Annual Good Food Festival & Conference invites you to three dynamic days that connect all the people active in the Good Food community – farmers, food producers, investors, trade buyers, policy makers, activists, families and Good Food lovers.

### **Spring Minnesota Elderberry Cooperative Members Meeting & VOTE, Elderberry Workshop, Farm Tour & Plant Sale**

Minnesota Elderberry Cooperative free workshop on growing elderberry and farm tour of some beautifully productive berry fields.

June 4, 2016 from 8am-5pm, free event.

River Hills Harvest Marketers, LLC and Berry Communications at Natura Farms

19060 Manning Trail N., Marine on St. Croix, MN 55047

<http://berrycommunications.minnesota-elderberry.coop/elderberry-cultivation.html>

### **2016 Comprehensive Elderberry Workshop, Jefferson City, MO**

June 17-18, 2016 Terry Durham & his Elderberry Team put on the original and most comprehensive workshop about growing elderberry. Keep an eye on [riverhillsharvest.com](http://riverhillsharvest.com) for other events.