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## Just Picked

Newsletter of the  
Upper Midwest Organic  
Tree Fruit Growers Network  
Volume 3, Issue 4, Fall 2007

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## Welcome to the Fall Issue of Just Picked

Welcome to our Fall issue of Just Picked, the quarterly newsletter of our Network. We now have over 350 growers and others interested in organic tree fruit production and marketing receiving this newsletter. I'd appreciate getting your feedback on the newsletter, and moreover, your contributions of ideas and articles. Thanks to those who already have contributed and commented.

In addition, I'd like your input on Network activities to date. Please use the enclosed questionnaire, which will also be available on our website under EVENTS. The more questionnaires I get back in October, the fewer I have to mail in November.

In this issue you can read about our last field day of the season, which was the first to include organic cherry management. Matt Stasiak of UW's Peninsula Agricultural Research Station hosted us. Jennifer Moore Kucera writes about her important research on soil microbial functioning and its measurement. This is a sneak preview to her presentation for the Great Lakes Fruit, Vegetable and Farm Market Expo in Michigan on December 6. Jim Koan is amazed at his preliminary research findings as he seeks to integrate organic pork and apple production. Find a handy checklist of fall orchard tasks. Dan Kelly updates us on his project to better monitor insect pests in the orchard. A listing of list-serv discussion forum topics are also inside.

Enjoy your harvests!

--Deirdre Birmingham, Network Coordinator.

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## Organic Orchard Field Day

at UW-Peninsular Agriculture Research Station

Over thirty people participated in the August 22nd field day hosted by Matt Stasiak of UW-Madison's Peninsular Agricultural Research Station (PARS) in Sturgeon Bay, Wisconsin, to discuss the organic tart cherry and apple plots he is establishing. Thanks to Matt, this is our first field day to feature cherries, whether tart or sweet. Barrett Gruber, a doctoral candidate in plant pathology with Patricia McManus, Ph.D., and Dave Parsons also gave presentations, which will be described shortly.

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Peninsular Field Day....From page one

Matt started with an overview of the research done at the station. Some research generates information of use to organic growers, but none of it has been done on a block dedicated to organic management. At least that was not until 2005. The award of a competitive grant from the Wisconsin Department of Agriculture, Trade and Consumer Protection made the start of these two organic plots possible.

You can read more about the orchard's establishment in our past winter issues of Just Picked, both 2006 and 2007, which I won't repeat here.

While they were experiencing an unrelenting drought, the Peninsula usually receives 35" of rain annually and enjoys a more Maritime climate. While there has been a steady decrease in the acreage devoted to tree fruits in the Peninsula and in the state, more fruit is being produced per acre. About 10% of Wisconsin's apple crop goes to processing, whereas much of the cherry crop does.

**Apples.** The varieties they chose for the organic research plots are those with good market potential. Some have decreased susceptibilities to particular apple diseases, although most are not considered disease-resistant cultivars, like those developed by the Purdue-Rutgers-Illinois collaboration. All are on various dwarfing rootstocks. Liberty was not included because it is not considered to be high quality.

- ó Sansa - not very susceptible to scab, but to powdery mildew
- ó Scarlet O'Hare
- ó Murray - no info on disease susceptibility
- ó Pixie Crunch
- ó Florina - disease resistant
- ó Honeycrisp - less prone to scab but to powdery mildew
- ó Nova Spy - Northern Spy type; high tonnage; easy to process; resistant to scab, powdery mildew and rust.

**Crop Thinning.** To thin the apple crop, once the trees start bearing heavily, they plan to use lime-sulfur at bloom time. They expect a single application of lime-sulfur could reduce the crop by only 25-30%. With a heavy cropload, one needs a 90% reduction.

They will follow with hand-thinning. There are few cytokinin products that they will consider, but they are thus far not strong thinners. A question was asked as to the impact of lime-sulfur on bees. No one knew of any research yet on this, but it could be a good question for the list-serv discussion forum.



Matt Stasiak discusses wildflower plantings for beneficial insects

Replant disease was discussed. The best healer of the soil, meaning the reduction in microbes that may be causing this, is time. The cause of replant disease is not yet known. At this research station they have done cover crop studies, an example of their research useful to organic growers that did not bear the "O-word." The cover crops were turned into the soil to stimulate the soil's bioactivity and to add natural, but deadly, fumigants such as glucosinolates found in fall canola.

**Soil Health.** The soil had been fallow for five years with fescue sod. Soil tests did not reveal any nutrient deficiencies or the need for lime. Straw mulch was added for weed control and to help build soil organic matter.

A decline in N may be showing up. But research at MSU found that clover and alfalfa mulch may add too much N. Apples use only 1/10 of the N that cherries do, where supplying nitrogen organically is definitely more of an issue.

While no amendments are added to the soil, every other row of trees were sprayed with fish emulsion. Dramm One fish emulsion was sprayed about once per week starting in the summer at the rate of 2 gal/ac in 60 gal/ac of water with an airblast sprayer to get good coverage. Soil and foliar tests are not yet available to look for impact from this treatment. Someone asked about mercury content in fish emulsion, but the mercury content has not been analyzed. (That may be more of a question for the companies supplying the fish products.)

While they were growing poplars for windbreaks and mulching materials, Matt is holding off since the microbes may pull nitrogen from the soil to decompose the high-carbon wood chips.

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## Soil Biology Research

*This is the first of a two-part article by Jennifer Moore Kucera, Ph.D. and edited by the Network Coordinator. This is almost a sneak preview of Kucera's work that she will be discussing in the organic tree fruit section on Dec. 6 at the 2007 Great Lakes Fruit, Vegetable, and Farm Market Expo in Grand Rapids, MI. She is a post-doc with Anita Azarenko, Ph.D., in the Horticulture Department at Oregon State University. To contact her: jennifer.kucera@hort.oregonstate.edu, 541-737-8959.*

**G**rowers are interested in learning more about soil biology and how their management decisions impact the important and varied functions carried out by soil organisms. Therefore, this article is the first of two to describe our research to determine what biological soil properties and processes can be used by not only research, but also commercial labs to indicate changes in soil quality, particularly from management decisions.

**Soil Quality.** Let's start by talking about what we mean by soil quality. I use the definition of the Soil Science Society of America. They define soil quality as, "the capacity of a soil to function within ecosystem boundaries to sustain biological productivity, maintain environmental quality, and promote plant and animal health." The question is how do we measure something so broad and complex?

**Measuring Soil Quality.** There is no direct or single soil test that can measure this capacity. Therefore, to assess soil quality we must use multiple indicators that indirectly measure various soil functions. According to the USDA's Natural Resource Conservation Service a 'good' soil quality indicator should be easy to measure, able to measure changes in soil function, done in a reasonable amount of time, accessible to many users, applicable to field conditions, sensitive to variations in climate and management, and represent physical, biological, or chemical properties of soil assessed by qualitative and quantitative methods. That is a tall order.

Some tests that help us assess soil quality are commercially available. Others are widely used in research, but have not yet been adopted by commercial labs. I will discuss some of those reasons.

Additionally, I provide in this article some preliminary results on the responses of these tests in organic and conventional sweet cherry orchards in Oregon

under different orchard floor managements, soil types, and climate. Properly managing the orchard floor is critical to adequately supply nutrients, control weeds, conserve water, and for disease and insect resilience.. Ultimately, we hope to develop more of a closed-loop system, in which on-farm resources can be used to feed the orchard system.

Although in our research, we also evaluate soil chemical properties, in this article I focus on measuring soil biological and biochemical processes to help assess changes in soil quality because growers want tools to optimize soil biological functioning. This is particularly important when using organic amendments, which increase soil organic matter content, provide nutrients, increase biodiversity, and conserve water. Because over 90% of all nutrients in the food chain pass through microorganisms and because of the diverse ecological functions soil organisms perform, soil biological and biochemical properties are a key component of many soil quality tests. They have also been used as early indicators of environmental stress.

We based our choices of soil amendments on input from local growers and previous research at Oregon State University. These amendments were applied when we established new sweet cherry orchards at two research stations in Oregon. I start by summarizing our preliminary results and then discuss in brief how we arrived at those as well as nitrogen and carbon fluctuations in the soil microbial community.

**Annual vs. Perennial Crops.** Most of the studies on soil biological measurements were done on annual crops and sources of carbon in organic amendments that are rapidly released. Very few studies looked at perennial agroecosystems, such as orchards, and the use of mulches and compost of contrasting qualities, which is what we chose to do.

**Preliminary Results.** We found that measuring the carbon found in the particulate organic matter, which I will define shortly, indicates strongly the amount of microbial activity in the soil. Because it reflects the microbial activity in the soil, this form of carbon represents the organic matter that is active and is more important to growing plants. This test was most sensitive to two of the soil treatments in this study, (bark mulch and municipal compost), but not a third (straw

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**UPDATE: SITE-SPECIFIC APPLE INSECT CONTROL  
THROUGH A WEB BASED APPLICATION**

By Dan Kelly, Blue Heron Orchard, Canton, MO

**Background.** As many of us know, orchards throughout the Midwest need better access to more accurate information for controlling apple insect pests. Lack of accurate data and ignorance of degree-day models for orchard pests can frustrate the grower and can accelerate the use of pesticides. The objective of a project I initiated with other growers and a computer software programmer is to give orchard operations, of any size, a simplified tool that uses existing Integrated Pest Management (IPM) information to accurately control the most economically threatening apple pests.

**Appropriate Technology.** Finding the appropriate technology to use in this project has been somewhat of a challenge to date, at least for me. Our main obstacle is to get a temperature-measuring device that will be compatible with various computer software platforms. This device must also be affordable so that a grower does not have to spend \$500 to get \$75 worth of apples, (hopefully organic).

Our programmer for the project is Chad Knepp, originally from Michigan. Chad had wanted to write the program in the computer language of Linux, a noble cause for free software. (Of course, most software companies don't see it this way.) Chad is versatile and can adapt to mainstream if need be and at this point is headed in that direction.

Another apple grower in the project, Leemer Cernohlavek and I met at the University of Missouri in Columbia with Dr. Bruce Barrett, the head of entomology, to discuss apple pest models. Dr. Barret has worked extensively in the past with mating disruption and apple tree fruit. He pointed out that in the Midwest there needs to be more updated research to develop models of tree fruit damaging insects. The problem for university researchers is both funding and a critical mass of tree fruit growers to justify spending resources on their issues. As grower numbers have dwindled so has interest from the university's administration.

So, along with acquiring appropriate and economical hardware to gather temperatures, we are also on the lookout for the most recent apple insect pest models to date. Anyone that has an inside track on the pest models is welcome to e-mail me: [blueheronorchard@centurytel.net](mailto:blueheronorchard@centurytel.net) Happy harvest despite the weather. ó

# The NetEx

The Network Exchange, or NetEx, is for Network growers to use. Please use it similar to a Classifieds section, but at no charge. NetEx allows Network participants to exchange information on services or things to share, buy, or sell. It is not for product or input advertising. However, for now, knowledge-based services provided by Network participants are fine. Other examples: exchange or share scion wood, find others to make bulk purchases, orchard consulting or pest scouting services, find orchard or processing equipment, host a work day, offer a seminar (such as grafting or pruning), and any other way to help us improve our organic production and marketing of tree fruits, except for product advertising.

## Looking for Natural Fruit

Natural Direct, LLC distributes produce directly from farmers in northern Illinois to homes in the Chicagoland area. Organic certification preferred, but not required. Farm pickup is available. Contact Scott at 630-551-7878 or [scott@naturaldirect.com](mailto:scott@naturaldirect.com).

## B & J Consulting

Eco-system organics of fruit trees.  
Setup \* Maintenance\* Conversions  
Bob Johnson 608-624-3777  
Jamie Bjornsen 563-538-4546

## Advanced Tree Fruit Grower Retreat

This two-day event on Wednesday-Thursday, February 20-21 before the 2008 Upper Midwest Organic Farming Conference is for advanced growers to come together and share production and marketing strategies, on-farm experiments, and ideas for 2008 on-farm trials. We will also discuss markets, as well as successful marketing, pricing, and sales strategies to wholesalers and retailers. A retreat location near La Crosse will be selected. Watch our January newsletter and the Network's EVENTS page on the MOSES website for more details.  
[www.mosesorganic.org/treefruit/events.htm](http://www.mosesorganic.org/treefruit/events.htm)

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mulch). We also found that how the organic amendments impacts the soil depends on the interactions between the type (or quality), quantity, and timing of the amendment and the crop in question, inherent soil properties, such as texture and mineralogy, as well as climate.

We also found that no single test can adequately predict soil nutrient availability and carbon building. In addition to the carbon in the particulate organic matter, we looked at mineralizable-N, soil nitrate, and specific enzyme activities in the soil. We are finding thus far that multiple tests better help us interpret how different management choices impact the soil's biology.

Now I will explain our preliminary findings.

**Our research sites and methods.** We started two experimental orchards in Oregon (one at the Lewis Brown Research Farm or LBF) in Corvallis and the other at the mid-Columbia Agricultural Research and Extension Center in (MCAREC) Hood River). While the LBF site is certified organic by Oregon Tilth, the Hood River orchard is certifiable, but not yet certified. Both had drip irrigation. We used two major approaches:

(1) Input substitution (IS) method. Nutrient needs are met by substituting synthetic inputs with rapid-release forms of organically approved, pelletized fertilizers made of fish and poultry byproducts. We used landscape cloth for weed control

(2) Whole system (Syst) method. Organic sources are used to fuel the soil microbial community, which will supply most nutrients. A four-inch layer of bark mulch was applied at LBF and straw mulch was applied at MCAREC in the tree rows. Weeds were managed by cultivation. (The in-row cultivation meant we could not establish high-value herb plantings as we had originally planned.)

The composition, activity and biomass of the soil are influenced by management practices. For example, adding bark mulch, straw, or compost, with C:N ratios ranging from 300:1 to 25:1, sparks the bacteria and fungi to break down these amendments.

We decided to further evaluate the use of two microbial tests on ten sweet cherry orchards in Oregon State. The two tests were carbon from particulate organic matter and potentially mineralizable nitrogen, (both of which are explained below). Six of these orchards are organically managed (five have been certified by Oregon Tilth). The other four use organic amendments, but otherwise use conventional weed and pest control measures.

**Measuring Soil Biology.** We chose to study the following soil biological measurements in the following table. Also listed is the major role or function of that soil component.

Soil Biology Measurement	Soil Function
Particulate organic matter(POC)	Considered a biologically active fraction of organic matter
Potentially mineralizable nitrogen (Nmin)	Indicates how much NH <sub>4</sub> potentially can be released from soil organic matter.
Enzyme activities	Indicates specific biochemical reactions of entire microbial community in soils that are involved in nutrient cycling
Fatty acid methyl esters (FAME)	Indicates soil microbial community structure and composition
Molecular quantification of microbial organisms	
Nematode population	Indicates soil food web functioning, species richness, and abundance.

Particulate organic matter (POM) is defined by its size. It is the part of soil organic matter that is large, at least as large as sand, which is greater than 0.053 mm. POM is comprised of plant-derived remains. This includes fungal spores, hyphae, and charcoal. In undisturbed soils, such as those under no-till management, the carbon from particulate organic matter (POM-C) reflects carbon derived from roots, (compared to carbon derived from residues on the soil surface).

Because carbon from particulate organic matter (POM-C) responds more to management changes than does the soil's total organic matter, many researchers measure the

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former. One reason that POM-C is so responsive is that it represents young organic matter. That is the organic matter that is very biologically and physically active (often referred to as labile). This part of soil carbon reflects microbial growth, nutrient supply, enhanced soil structure, and increased plant available water. (Enhanced soil structure means a decrease in erosion potential.) Many researchers think POM-C reflects microbial activity, which is the main driver of decomposition and nutrient cycling.

POM-C might also be a predictive tool of nitrogen mineralization potential, that is the potential for the nitrogen to convert to a form that is available to plant roots when crop residues are added to soils. Measuring POM-C is particularly promising and is something that commercial labs could readily adopt. In contrast, other fractions of organic matter are more protected from microbial attack so that subsequent release of nutrients is limited or occurs so slowly that it is not considered an important source. An additional soil quality indicator you may have heard of, the soil microbial biomass, has advantages similar to POM-C, but it is harder (and often more expensive) for commercial labs to measure.

**Potentially Mineralizable Nitrogen.** We used potentially mineralizable nitrogen (Nmin), which some commercial laboratories can analyze, as a proxy for soil nutrient status. We used enzyme activities, which are not currently available at commercial labs, as a proxy for overall biological activity. We expected that soils with high POM-C concentrations would also have high Nmin potential values. In other words, they would be positively related. Nmin potential is important also because it indicates the amount of ammonium-N (NH<sub>4</sub>-N) that potentially can be released (mineralized) from the organic matter. It is called 'potential' because the test is done in the laboratory under controlled temperature and moisture levels. But we found only a weak, positive relationship between POM-C and Nmin potential and only in samples collected at a shallow depth (top 6"). Moreover, this result was highly dependent on the particular farm on which it was tested. It, therefore, was not a reliable indicator of Nmin potential for these soils and test conditions.

**Looking for Relationships.** In contrast, a consistent positive relationship between POM and three out of the five enzyme activities across sites at both shallow (0-6") and deeper (6-12") soil depths supports the

hypothesis that POM represents the 'active' soil organic matter pool. As both Nmin and enzyme assays are indirect measures of nutrient cycling, it is difficult to say which test best represents the true value. But because multiple enzyme activities showed a stronger and more consistent trend, and these enzymes represent multiple components of nutrient cycling (involved in N, P, and S cycles), it is reasonable that POM does represent the active fraction of soil organic matter in our soils. Perhaps it is just not a good indicator of N mineralization potential in our test conditions.

Results from the trials at the OSU experimental orchards were variable and dependent on the organic amendment applied and sampling depth. Changes in POM-C were more pronounced with our different amendments than if we had only used total soil organic carbon values alone. However, when bark mulch was used, POM-C was not correlated with any enzyme activity or Nmin potential. When municipal compost was used, POM-C was correlated strongly with enzyme activity. This may be because bark mulch has a much higher C:N ratio (over 300:1) and thus is more difficult for microbes to decompose than municipal compost with a C:N ratio of around 25:1. These findings suggest that POM-C was not a good predictor of potentially mineralizable N with low quality (i.e., high C:N, high tannin content) organic materials, such as bark mulch.

It is important to note that it is possible that better relationships may exist with other tests used to predict nitrogen mineralization. An example would be the Illinois soil-N test, which incubates the soil under aerobic conditions. The lab we use incubates soil under anaerobic conditions.

In contrast, two applications of straw mulch at the sandy MCAREC site resulted in no gain in POM-C or overall soil organic carbon. In fact, we found slightly decreased POM-C concentrations at 6-12" depth. This could indicate that the straw mulch had a priming effect on the microbial population. It stimulated activity in the microbes causing more decomposition of organic materials. This priming effect is also supported by the fact that we measured increased Nmin potential (release of ammonium nitrate (NH<sub>4</sub>-N) from organic matter) in soils with the straw than with the input substitution approach, and we saw decreased soil nitrate concentrations (NO<sub>3</sub>). Microorganisms are also responsible for converting NH<sub>4</sub> to NO<sub>3</sub> (a

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process called nitrification). Therefore, decreased soil NO<sub>3</sub> concentrations may mean that NO<sub>3</sub> was being consumed and used by the soil microbes. They temporarily tie up NO<sub>3</sub> in their cellular components (a process called nitrogen immobilization) so that it was not available for plant uptake.

It is possible that the straw mulch was rapidly decomposed by the microorganisms, especially given the relatively low C:N value of the material (about 25:1). Also the mulch was incorporated into the soil, which increased the surface area contact with the microbial population. The coarse-textured soils at this site have less overall capacity to retain organic C. Therefore, organic matter additions that are readily decomposable are very transient and hold little long-term potential for carbon and nutrient storage in sandy soils with low organic matter content.

Finally, given the different relationships between particulate organic matter carbon, potentially mineralizable nitrogen, soil NO<sub>3</sub> status, and some enzyme activities in these soils, it is clear that no single test is adequate in predicting soil nutrient availability and organic carbon building. A multi-test assessment could provide greater interpretative power in determining how management decisions impact the soil biological system. We will then be better equipped to make farm-specific recommendations to synchronize nutrient availability with crop need in a more closed-system approach, an approach where the orchard (or crop) system can feed itself utilizing on-farm or local resources.

Our lab group will continue collecting data and refining our interpretations. In the meantime, I will continue this discussion on soil biological indicators of soil quality in part II, which will provide more detailed information on soil enzyme assays and their applications, strengths and weaknesses. ó

## Fall Orchard Tasks

Jamie Bjornsen of Countryside Orchard, Lansing, Iowa, and I worked up a list then added from Michael Phillips' book, *The Apple Grower: A Guide for Organic Orchardists* (at [www.HerbsAndApples.com](http://www.HerbsAndApples.com)) to develop the following list of fall orchard tasks.

- ó Record data for fruit damage assessments.
- ó Gather insect pest monitoring traps, clean and store.
- ó Keep orchard floor 'clean': Gather all drops weekly to feed to livestock.
- ó Ensure bases of trees are protected from rodent damage by pulling mulch away from trunk, installing tree guards, and mowing the orchard floor and fallen leaves.
- ó Remove leaves or spread lime on fallen leaves, flail-mow, then spread well-aged compost.
- ó Check and repair deer-fencing. Hang peanut butter strips on electric deer fencing, and ensure that it is constantly working.
- ó Check fruit buds to see what you might expect for next year.
- ó Flowerbeds for beneficial insects: Cut flowers and lay on top of beds. Burn flowerbeds to remove habitat for birds and mice. Tag plants that need to be thinned out.
- ó Get ready to prune later in winter: Sharpen pruning shears.
- ó Enjoy your harvests!

## New Scouting Resources Available on MSU IPM Website

The MSU IPM Program has developed two web resources featuring photos and descriptions from the popular pocket-sized scouting guides for apples and stone fruit. The information was developed by Dave Epstein, Larry Gut, George Sundin, Alan Jones and KimberlyMaxson-Stein.

### On the Internet

- Scouting for pests in apples: <http://ipm.msu.edu/apples.htm>
- Scouting for pests in stone fruit: <http://ipm.msu.edu/stonefruit.htm>

### Print publications - great for viewing in the orchard

Call the MSU Extension Bulletin office (517-353-6740) or your local Extension office to order copies. These pocket-sized guides have color photos, pest ID and damage descriptions and are made of water resistant paper:

- A Pocket Guide for IPM Scouting in Michigan Apples. Price \$14. Bulletin E-2720. (Spanish E-2720SP).
- A Pocket Guide for IPM Scouting in Stone Fruits. Price \$12. Bulletin E-2840 (Spanish E-2840SP).

### Upgrade your scouting skills with dvd training

A Practical Guide to Scouting Apple Orchards is a DVD that compliments the scouting guide. It is designed to give apple growers and consultants easy access to information that helps de-mystify the pest management decision-making process. The 90-minute DVD contains 21 modules covering topics from choosing a weather monitoring system to discussions on degree-day models and monitoring primary disease and insect pests. The DVD is designed for those who want to learn about specific topics at any point during the growing season by simply choosing the desired tracks from the DVD menu. Call the MSU Extension Bulletin office (517-353-6740) and request DVD273 (price \$29.95).

## Integrating Organic Pork and Apple Production - Project Update

I contacted Jim Koan and got an update on their one-year pilot project that has been described in the last two issues (Spring, Summer) of Just Picked. As soon as he received my email, Jim called. This project is quite exciting to him and the two researchers involved. He is happy to share their preliminary findings.

They are quite excited with the pigs' performance so far to reduce plum curculio damage to his apples. Jim reports less than 3% damage from PC in the plots with the young pigs and no other treatments used for PC. That is far less damage than Jim expected. In the plots treated with other organic strategies there was 5% damage. In the control plots there was 15% damage. "They really are finding those June drops, devouring them, and their digestive tracks leave no trace of PC, alive or dead," according to Jim.

In terms of pork production, Jim describes it as "pig heaven here!" It has been a hot summer, and the pigs were fed only apple pomace in addition to the orchard vegetation. Consequently, while they are all active, healthy, and round, they were slow to gain weight, reaching 70 lb at 5 months of age. The Berkshire breed, however, is slower growing and they were getting more exercise compared to hogs kept in confinement. Without additional protein they can be expected to gain weight more slowly. As the project continues, the researchers will consider what is adequate weight gain and possibly supply alfalfa as a protein source if needed. Organic alfalfa costs less than adding organic soy to their diet. However, slower growth is OK with Jim.

Another hog grower who stopped by because he is considering transitioning his swine management to organic, was amazed at how friendly the Berkshire pigs are on Jim's farm. "Pigs come running up and want to get hugged and kissed," said Jim. He feels the orchard environment is playing a major role in their health and happiness.

Fencing is another matter. A single hot wire did not keep them in for long. After a couple weeks these smart little guys figured they could charge through the pulsating electric fence with minimum shock. Hog panel fencing, while more expensive, might be the answer, particularly if the pigs are rotated any less than every week or two.

The animal scientist on the project, Dale Rozeboom, had just given Jim a report on the pig fecal samples he is collecting and testing for worms. Much to Dale's amazement, none were found. While there have not been any pigs on Jim's land for 30 to 40 years, there have been horses, deer, raccoons, opossums, and other wildlife in the pasture the pigs now graze. Jim just wondered if their diet rich in apples and apple pomace might help with the worms. Producers do buy cider vinegar from him for their livestock's health.

The sows on pasture did take longer to cycle and come back into heat. Instead of four to seven days, it was about one month. That changes the calendar a bit for the next litter. But it is too early to speculate if the pasture conditions were the cause. This question too is part of the future research.

Their future research will look at two sizes of pigs, to find what is optimal for the orchard, and the density of pigs per acre needed to control PC with optimal impact on the orchard floor.

This pilot year is continuing to be an exciting one for Jim. He is optimistic that he can help open a whole new world of opportunity for apple growers by integrating pork with apple production. ó

### List-serv Discussion Forum Topics

When the Network first started in February 2004, the first thing we did was start a list-serv. That list-serv of about 18 addresses has mushroomed to 240. It is a great vehicle for discussion when we cannot meet in person. Use it to share questions and answers, information and ideas, post event announcements, and more.

One note of caution: While we don't pay for the list-serv, we pay for it by the free advertising that is attached to some of our emails in the form of links. Please ignore these. They are not endorsed by the Network or MOSES. It is ironic because list-serv etiquette is that participants do not advertise products or services.

If you wish to join the list-serv, please email the Network Coordinator. Include your name and email address in the

message. Once you join the list-serv, you will receive instructions from Yahoogroups on how to review previous postings. You can go back and read the emails on any of these topics and more that interest you. If you wish to try out the list-serv, feel free to do so. The welcome message, which you should save, includes instructions on unsubscribing.

If you joined since the Summer (July) issue of Just Picked, the topics discussed since then are:

- pear scab
- pig grazing in orchards
- apple thinning
- flooding in WI and MN
- T-bud and chip bud grafting techniques for fruit trees on at <http://blip.tv/file/346153/>
- apple russetting and cracking
- apricot harvest and identification
- preventative strategies to avoid spray drift and spraying the wrong land.



Field Day...From page two

The addition of liquid cow manure and other sources of N were discussed. Interestingly, while Matt said that one is not to add nitrogen as the trees are hardening off, he has never actually seen subsequent winter damage from applying nitrogen then.

Good orchard floor management is important. There can be a 40% decrease in tree size (rate of growth) when trees are grown in sod than without sod. Soil fertility and weeds are dependent on groundcover management. Organic mulches can both help prevent weeds and aid nutrient cycling.

The plots are irrigated by drip under the mulch. The lines are flushed with sulfuric acid once per month to reduce mineral buildup in the lines. The treated lumber used for trellises are not allowed in organic certification. Karen Kinstetter, who runs four OCIA chapters, said that in this case the posts might be grandfathered in.

**Deer and Rodent Damage Prevention.** Poplar and black locust were being grown for a living deer fence. Black locust grows tightly and has thorns. An electric fence for this small plot was also evident. It works well, according to Matt, as long as it is not outlining the whole research station.

Pans of milorganite are also used as a deer deterrent and fertilizer for the windbreaks. Milorganite, a biosolid waste product, is not allowed in organic production, so it is only on the outside perimeter of these plots. The heavy metals that might be present in such products were thought to have been removed in Milorganite, which is made in Milwaukee.

Someone asked about hot pepper spray. Matt said this can work, but with their normal 35" of precipitation, it would be gone quickly.

Straw mulch can lead to increased rodent damage. Hardware cloth and trunk wraps have been well worth the labor and materials to apply them. While rabbit damage is variable at the station, voles and mice pose continual problems.

**Other Pest Management.** As we entered the orchard one saw the required signs for orchard reentry intervals after spraying. While REIs are short or non-existent with approved materials, copper and other elements can be dangerous.

While sooty blotch and flyspeck are not typically problems at the station, powdery mildew is.

With the lack of rain, they had not mowed since June, as there was very little regrowth. The lack of moisture was helping to reduce the weed population in the row middles.

The weed issue is still a tough one. Some rows had plastic mulch. They were tilled first and then the plastic applied. The cost of using plastic mulch is about \$900/ac. While it is a onetime cost and application lasting for years, it does not add any organic matter. Organic mulch can also cost about \$900/ac per yr, particularly due to the costs to harvest or purchase it, and then to continually apply it. It does aid in nutrient cycling.

Matt is trying to keep quackgrass at bay with repeated straw mulching. A side unloading chopper box or Mill Creek Mulcher may help in adding straw mulch more efficiently. The latter, however, is not good with fresh clover.

Beneficial insect plantings were at the end of each row. The plants Matt is establishing are rattlesnake master, butterfly weed, golden alexanders, lanceleaf tickseed (*Coreopsis*), oxeye sunflower, *Potentilla arguta*, purple coneflower, sky blue aster, Ohio spiderwort and wild quinine.

Insect pests have been primarily gypsy moth and potato leafhopper to date. Dipel has been used to control green fruit worm, leafrollers, and gypsy moth. Aza-direct Azadirachtin was used this year against potato leafhopper. Entrust (spinosad) was used against apple maggot, leafrollers, and codling moth. Aphids have not been a problem. Scouting is really important so that one knows where to look for what. Although each year can bring new surprises as well, such as mites seen in places on the station where they were never seen before and other spots where they typically flare were fine.

For scab and powdery mildew (PM), Serenade Max (*Bacillus subtilis*) was applied. The Sansa was more affected by PM than expected and lost a lot of its leaves. Sulfur was used against scab as well. Copper is applied as one delayed dormancy spray. He added the spreader-sticker BioTune in 2005 and '06.

*Continued on page 10*

Field Day...From page 9

Rates and timing of pesticide applications for 2005, 2006, and 2007 will be available on the Network's RESEARCH webpage.

**Apple Bagging.** During lunch, (a delicious one, according to the feedback forms), Dave Parsons gave an excellent powerpoint presentation on apple bagging. (Dave Parsons works part-time with Bill Wright, a UW-Extension Community Garden Coordinator for Brown County, and horticulture teacher at the technical college. Bill is also on our Network's Advisory Council and roped Dave into talking about apple bagging.) His presentation drew quite a bit of interest and praise from participants. Apple bagging is labor intensive, but for a small orchard may make a difference in the number of high quality fruit harvested. One can become quite proficient at it, bagging 100 fruit in an hour. The method is widely used in Japan, as well as Korea and China.

Clear, ziplock, plastic sandwich bags are used to allow the fruit to color. Thin apples to one every six inches apart along each branch. The bag is placed over the fruit and a staple applied on either side of the stem, when the fruit is very small, ideally immediately following petal drop and before insects get to them. A small snip at the bottom corner of the bag allows moisture to drain from the bag. One can completely eliminate apple maggot and codling moth infestations with this method.

Dave showed how one's initials can be colored onto the fruit skin by shading applied to the clear plastic bag in the shape of the desired letters or symbol.

Dave has developed with others a video on apple bagging. There will be a link to it from our webpage titled INFORMATION for informational resources. (Many, many resources are there if you have never checked it.)

**Cherry Leafspot and Copper Fungicide.** After lunch we walked to the cherry research plot of Barrett Gruber who is studying the impacts of copper (Cu) as a fungicide to control cherry leafspot. Barrett wrote a concise handout, which will be added to the RESEARCH part of our webpages, and from which I pull much of the following.

Cherry leafspot is a serious foliar disease of tart cherries caused by a fungus *Blumeriella jaapii*. It is considered the apple scab of cherries. It causes the

leaf to yellow (chlorosis). The tree can defoliate by late September or early October, which affects its winter-hardiness, as the health of the tree is major determinant of winter hardiness.

There is renewed interest in copper as a fungicide due to the fungal resistance that is developing against most synthetic fungicides. This is due to the specificity of synthetic fungicides to target specific biochemical processes of the *B. jaapii* fungus. In contrast, copper-based fungicides inhibit protein metabolism in all fungi. Therefore, resistance is low to non-existent.



Barrett Gruber of UW shows defoliation from cherry leafspot.

A problem with copper is that excessive amounts can disrupt the plant's ability to absorb sunlight for photosynthesis. That could affect the leaf's ability to produce sugars and thus the tree's ability to produce quality, marketable fruit. The copper can cause leaf bronzing on the leaf's underside. Barrett's research with his advisor, Prof. Patricia McManus, is looking at decreases in plant health from use of copper. They are asking if the damage from copper may be worse than the damage from cherry leafspot (CLS). They are finding a difference between the outer, "sun-adapted" leaves and the inner, "shade-adapted" leaves. The sun-exposed leaves may be more sensitive to damage from copper-fungicide than the shaded leaves. But this is ongoing research, so the operative word is "may."

A question was asked as to whether copper can build up in the soil. Under the small amounts needed to control fungal diseases, it does not build up, whereas lead and arsenic can and have built up in soil. One would have to spray a lot of copper for it buildup in the soil. However, in northern Europe, copper is not allowed in organic production.

Like sulfur, copper must be applied before it rains, about every seven to ten days depending on the weather. Similar to scab, the *Blumeriella jaapii* spores are released when it reaches 20°C and the leaves are wet for at least five hours. It is, however, more virulent than apple scab. Their research has not yet studied application rates.

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“Copper and sulfur are like hammers against diseases”, according to Matt, yet they don’t cause fungal resistances to build. They must be applied before rains, and then don’t last long or have residual affects. So they are applied more frequently than synthetics.

In terms of varietal differences, Northstar is less susceptible to cherry leafspot, but it is not a high quality cherry. Balaton on CT500 (a clone of Mahaleb) is not losing its leaves as much from CLS, but it is not as hardy as Montmorency.

**Organic Cherries.** The Montmorency cherries on Gisela-6 rootstock are three years old. They have lost 25-50% of leaves due to phytotoxicity from copper applied with some Serenade and sulfur. The trees are growing slower with organic mulch than the poly-mulch (plastic).

The pesticide application schedule for the year will be posted on the RESEARCH page of our webpages. Copper sulfate (Cuprofix) may be helping not only with CLS, also with powdery mildew (PM), as that is not a problem here. But powdery mildew is less of a problem in Wisconsin than in Washington where they have less rainfall but more humidity. He never saw it until now with organically managed trees in a dry

year. PM is of more concern in young trees. Serenade was also sprayed to control powdery mildew. Fish emulsion was in the mix as its manufacturers claim it helps to control PM. Brown rot is tough to control in wet years, with higher sugar content in the cherries. They “just put-up” with bacterial diseases. A healthier tree helps the most against bacterial canker.

Of insect pests, plum curculio is the worst. They will try Surround to control it. Cherry fruit fly maggot is also expected to be a problem when the trees start bearing, for which he will likely use Entrust. It is only expected “to help.” A spinosad product with a bait added called GF 120 is more effective due to the bait. It is labeled for cherries and he recommends it growers in EQIP (Environmental Quality Improvement Practices) program, but doubts it is allowed in organic operations. Dipel was used against green fruit worm and gypsy moth.

In conclusion, the feedback on the day was all highly positive. Many thanks to Matt, his two field assistants, to Dave Parsons, and to Barrett Gruber for their time and moreover, their important work to improve more ecologically sound fruit production systems. Matt hopes we can do this again in a couple years. I do, too. ó

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## Please respond to the following questionnaire. Your input is very valuable.

The Network and its participants are providing quite a few opportunities for growers to date. These include web pages listing all available information on organic tree fruit growing and marketing; field days, orchard walks and on-farm events; this newsletter; seminars such as at the Organic University; sessions at the Upper Midwest Organic Farming Conference, and a list-serv discussion forum. Six of you have stepped forward to form an Advisory Council to guide the growth of this Network. The Advisors, MOSES, the RMA (our major funder), and I wish to know what aspects of the Network you value most. Perhaps there are things you learned from these diverse opportunities that you are using in your orchard or in planning a tree fruit-based business. This helps us know what impact these opportunities are having, what bang for the buck we are getting, and will influence our planning for the future. (Feel free to answer any question below on an additional piece of paper. Sorry, our space is tight this issue!) I will appreciate receipt of your responses in October by email, fax, or mail. Thank you in advance!

A. I have used the following opportunities the Network offers: (please check all that apply)

- web pages
- field days, orchard walks
- read the newsletter
- list-serv discussion forum
- Network mtg at organic conference
- Organic University
- Organic conf. sessions on tree fruit

C. Two or more things I am doing as a result of what I learned at the opportunities I used above:

B. If I had to pick the top two or three opportunities that I want to see continue they would be:

- web pages
- field days, orchard walks
- read the newsletter
- list-serv discussion forum
- Network mtg at organic conference
- Organic University
- Conference sessions on tree fruit

D. I would like more information on the following to reduce my risk and improve my organic production and marketing of tree fruits?

E. My additional thoughts or ideas for future Network activities for 2006 are:

## Announcements

ó **Organic Pork and Apple Field Day** at Jim Koan's Al-Mar Orchards in Flushing, MI, Friday, November 2. Learn about the hog grazing project and other organic pest management tactics being researched and implemented in MI orchards. For more information contact David Epstein, at (517) 432-4766; or epstei10@msu.edu

ó **Midwest Apple Improvement Association 2007 Annual Meeting**, November 10 in Heath, OH. This association involves both growers and university researchers whose mission is "to develop economically and culturally viable apple cultivars for the Midwest." Those efforts include apple scab resistance and apple biodiversity. For more information go to <http://www.hort.purdue.edu/newcrop/maia/default.html> or contact Mitch Lynd at 740-967-5355.

ó **2007 Great Lakes Fruit, Vegetable, and Farm Market Expo**, December 4-6, Grand Rapids, MI. December 6 includes sessions all day on organic production and marketing. <http://www.glexpo.com>

ó **Advanced Tree Fruit Grower Retreat**, February 20-21, 2008 near La Crosse, WI. Details TBA

ó **Organic University**, February 21, 2008 in La Crosse, WI. <http://www.mosesorganic.org>

ó **Upper Midwest Organic Farming Conference and Midwest Organic Research Symposium**, February 22-23, 2008, La Crosse, WI. <http://www.mosesorganic.org>

***Just Picked*** is a publication of the Upper Midwest Organic Tree Fruit Growers Network.

Our Mission is:

*To share information and encourage research to improve the organic production and marketing of tree fruits in the Midwest, and to represent the interests of growers engaged in such.*

The Upper Midwest Organic Tree Fruit Growers Network was started in 2004 for the purpose of sharing information and encouraging research to improve organic tree fruit production and marketing in the Upper Midwest. The Network is supported by the Midwest Organic and Sustainable Education Services (MOSES) and the Risk Management Agency of the USDA in addition to other event sponsors. This newsletter is produced by MOSES, layout by Jody Padgham.

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