

April/May 2004 SFI E-zine

Better late than never? Been busy, and couldn't find time to get this done in April. So, a two month issue!

- 1. Microscope Class for Compost Tea!**
- 2. Field Guide for Actively Aerated Compost Tea now available!**
- 3. Interest in "Tea-Off"?**
- 4. CTTF recommendations**
- 5. Grower Experiences South Africa!**

1. Microscope Class

The little microscope manual is just about ready, and we're ready to start training people with the little microscope.

The first classes are May 28, which is a Friday, and then the next Friday, which is June 4. We'll see what demand is before setting up any more classes.

These classes are for people wanting or needing instruction on what they see using their microscope. We can order, and properly set up for you, the microscope you want, OR you can bring your own.

You need a microscope with 4X, 10X, and 40X objective lenses (that 40X lens is critical), 10X eyepieces (not 15X eyepieces, please. You may think more magnification is better, but it is empty magnification, because it doesn't give the resolution you need. Confused by that statement? Come to the class, ok? To see is to understand in this case).

You need a microscope with a N.A. 2.5 (or greater) ABBE condenser, with an iris diaphragm. ABBE condensers should come with the iris diaphragm.

We have two microscopes we will offer - \$400 and \$1000, your choice. Yes, the prices have been updated from the list serve announcement.

The difference in price is based on the quality of the optics. If you want to be able to resolve bacterial shapes easily, you HAVE TO buy the expensive scope. If you want to be able to see generally whether you have critters or not, and maybe see a bit about

the different kinds of critters, the less expensive scope will do.

We tested a \$450 scope which could do the job, but the condenser didn't focus properly, and fell out of the holder on occasion, so I rejected it as a choice. There are other \$500, \$800 and so on microscopes, which don't do anything more than the \$400 scope. So, I settled on the \$400 as an inexpensive alternative.

So we have people unhappy with the \$400 scopes. Then go search the web and find one for less, and bring it to class. We'll do the best we can to work with what you bring, but we reserve the right to tell you – "This just isn't going to do what you need".

If you want, we will order your choice of microscope, and carrying case, and set it up for you for the class. Just remember, you need to be able to carry it back, and it is much safer if you carry this as cabin baggage and don't leave delicate instruments to baggage handlers.

We have to have at least 10 days advance notice before the class if you want us to order the microscope for you.

As soon as we get the other SFI labs trained to do these classes, they will offer these classes too, I expect. So, probably New York will offer them next fall, as well as Mexico, and Canada.

The format of the class is:

- buy the microscope from us so it will be here when you arrive, OR bring your microscope with you.
- If the microscope you bring with you doesn't work for what we are trying to see, we will TRY to have a loaner you can use for the class. But it would be a good idea, if you decide to bring your own microscope, to discuss your microscope with me BEFORE you come, so we can at least have an idea whether you can resolve the things you need to resolve.
- Introduction to microscopes and how to make the most of them.
- We will go through Kohler illumination and get everyone to be able to maximize the amount of light their microscope can focus on the sample.
- Shadowing techniques. This is critical. The microscopes we have at SFI use DIC, which is a shadowing technique, and allows you to clearly see things that have the same refractive index as water. Phase contrast methods fail because of that little problem (little? chuckle). So, with your inexpensive compound scopes, we will help you do what you can to mimic the kind of clarity we get with the \$25,000 scopes.

- We will look at examples of the many different critters you will be seeing in teas. We will do compost as well, so you can see why these microscopes don't work really well with compost.

- We will see different kinds of bacteria, fungi, protozoa, nematodes and the insect larvae a few people were asking about a couple weeks ago. Yes, you can start to see whether you have Bacillus or not, or Corynebacteria, or actinomycetes - more properly called actinobacteria - BUT you cannot ID the cells you see to the species level. Often not even to genus.

- You can, however, do as Bruce, Tom, Ted and others suggest, and get an idea of how much the KINDS of bacteria or fungi or protozoa, etc. are changing. You can monitor your tea brew hourly if you want to see the changes in critters as the tea matures.

- We will help you see WHEN your tea is "ready". We will help you learn the cues you need to develop for your own system, to know whether the tea is growing enough of the right organisms.

- We will teach you how to tell if your tea is "ready". If you don't have the biology you need, you should brew longer, or add some foods, or even add more compost.

- We'll help you understand how to tell that you should have put less compost in - there is a brewer out there that tells their clients to use something like 70 pounds of compost to make 100 gallons of tea. The compost is an inoculum - if you have to use that much compost, it should be clearly telling you the tea machine can't grow the organisms.

- We will go through the standard curve for determining good tea with adequate or even outstanding organism biomass, or determining "bad" tea, lacking in the proper set, or kinds, of organisms. We'll go through some ideas for "fixing" bad tea.

Sometimes, you just should throw the smelly tea on some weeds, because it would be nice to kill them. Sometimes, you can add more compost, or more foods, and bring the tea up to par. We will go over how you know those situations.

- I'll be teaching the classes, at least these first few classes, where we are getting the format perfected.

- The entire morning will be instruction on how to use the scope, and what the creatures are you are seeing.

- We will continue on into the afternoon, until 5 pm, for those who want or need the help. For those of you who catch on rapidly, you could leave mid-day, or anytime into the afternoon you feel happy with your ability to see what you need to see.

Hope to see you at a class soon!

2. Field Guide Special!

Web site special!

Buy the Field Guide and get the Row Crops and Vegetable CD at half price.

Available through the Soil Foodweb website, www.soilfoodweb.com

3. Anyone interested in a “Tea-Off?”

No responses on doing a “Tea-Off” at the July 16 – 17, 2004, “Practical Compost Tea” meeting in Kirkland Washington.

How about at the ICTC, Highlands S&W, and SFI sponsored meeting in Monterey next January, 2005?

There is an east-coast ICTC compost tea meeting in the works as well, where we can repeat the Brew-Off experience on the east coast. Stay tuned for more news here!

4. CTTF recommendations

The Compost Tea Task Force released its recommendations to the National Organic Standards Board in April. I voted not to accept the recommendations as written, because there were several glaring errors in the set of recommendations.

I have written my comments to the Task Force Chairperson, and presumably the Task Force Chair will pass those comments on in the NOSB meeting when the recommendations are submitted.

I’ll find what I wrote, and put it in next month’s e-zine.

The bottom line on all this is that those people making money selling compost or compost tea, those people interested in having tools that do not require payments

to multi-national corporations, HAVE to find a way to fund testing to document how compost and compost tea can be assured of not causing pathogen growth in the final product.

SO, HERE IS THE PERTINENT INFO SUMMARIZED BY STEVE DIVER:

"Compost tea made with compost tea additives can be applied without restriction if the compost tea production system (same compost batch, additives, and equipment) has been pre-tested to produce compost tea that meets the EPA recommended recreational water quality guidelines for a bacterial indicator of fecal contamination (US EPA, 2000). These indicators and the passing criteria are Escherichia coli (126 CFU/100ml) or enterococci (33 CFU/100ml). At least two compost tea batches must be tested using accepted methodology (APHA-AWWA-WEF, 1999; US EPA, 2000), with the average population of indicator bacteria across compost tea batches used as the measurement of passing."

The CTTF says that compost substrate for compost teas should be NOP compliant OR be made according to the more flexible guidelines set forth by NOSB Compost Task Force. Both of these specify compost guidelines to meet PRFP's for time & temperature. Thus, it presumes that such compost substrates used to make compost tea are of good enough quality -- based on PRFP -- that pathogens will not be a concern.

The CTTF says that compost teas made with compost tea additives (molasses, kelp, yucca extract, rock dust) can be used without restriction if the batch process is duplicate tested and the results are A-OK.

The term used "without restriction" can be put into perspective. It simply means that the 90/120 DBH rule does not apply if the compost tea is made according to the guidelines set forth.

This means that compost teas meeting the guidelines can be foliar applied to a transplant to boost plant health or foliar applied to the growing crop to enhance disease suppression, etc.

Hope this helps.

5. Willamette Organics Opens: Compost Tea Available in Oregon

After completing the SFI Certified Advisor program in January of 2003, I formed Willamette Organics, a company that does soil food web consultations, manufactures and applies compost tea. Last year our sales were pretty much limited to the Salem Saturday Market and we were producing from a 55 gallon KIS machine. In late summer, we added a 100 gallon BobOlator to meet demand for a home application service. This spring, we signed a contract for green maintenance on a 275 acre sustainable community being developed in Salem, Oregon. I also bought a 500 gallon mobile brewer/applicator from Bob Norsen and we have begun doing deliveries to farmers and landscape applications. The machine works well and is versatile enough to allow me to mix adjuvants for each separate application – that is, if I am doing a 30 gallon turf application, I can mix the tea with fish hydrolysate in a poly drum and spray out of the drum without feeding the whole batch of organisms in the 500 gallon brewer.

It is my hope that Willamette Organics can be a part of the shift away from conventional farm, garden and landscape management using toxic chemicals. The challenges are monumental but we try to take things just one step at a time and give the best possible service to all of our customers and potential customers. I find the support I get from Soil Foodweb critical to providing good direction to my clients. And as far as compost tea, well, I guess you could say Elaine wrote the book on compost tea.

What is important to our customers is the effectiveness of our product. SFI has put together an excellent compost tea quality assurance program that helps us maintain a high quality compost tea, one that I know will be effective for our customers. Now SFI is about to launch a certified label. This is an extension of the QA program that will allow me to use Elaine's marketing power to help sell my product and services. Now not only will I know I have great compost tea, my customers will also know and I expect they will look for the SFI certified label.

It is very rewarding to me now to have my old customers from last year's Saturday market come back and tell me their stories. I found that with about half of those I served, once they started using compost tea and saw the difference it made, they fell in love with the product and I believe they feel good about the way they are treating their plants. We have been all organic on our small farm for over 4 years now and our gardens stay lush and cool in the summer heat with moderate watering.

Jim Toler, President
Willamette Organics

5. Grower Experiences

I arrived in Johannesburg, and was picked up at the airport by John and Hazel Fair who organized the talks around the country. Drove to just outside Petersburg the next morning, and was picked up by helicopter to fly over the ZZ2 farms between there and Mooketsi.

ZZ2 has been using compost in tomato production, with significant reduction in inorganic fertilizer, pesticides, and water use. All of which matches our experience in the US, Australia, New Zealand, and Mexico.

Of concern was rotational time out of tomato, and whether we could shorten the “fallow” grassland recovery period of 7 to 15 years before being able to go back into tomato. In work we do in the US, we have reduced or completely removed the “fallow” period, because by getting organic matter back into the soil, which allows the organisms to build soil structure properly, means there is no need to “store water” or rebuild soil through that fallow period. Good soil structure means water is retained even when plants are in the system.

Disease in tomato is another concern, and impacts of foliar organisms protecting the leaf surfaces are the same for tomato in the field as we have seen for tomato in greenhouse or hothouse production. Trials with Territorial Seed in field production showed blight, foliar insects and other problems were reduced to non-concern when compost tea was applied. These results should be possible in South African production systems.

Mr. Van Zyl flew us over their game reserve area, and I got to see waterbuck, kudu, gazelle (I think), impala, and zebra from the helicopter. It was great to see all those animals I have only seen on TV or in a zoo before! Amazing!

We stopped by the composting site. Recent rains had saturated their compost, and forced it anaerobic. They fully understand that compost covers are important. We also discussed a larger size woody chunk to maintain physical structure during the early stages of composting. Of course, getting fungal biomass up and growing is important, to get those chunks chewed up before the end of 6 weeks!

I stayed at a nice lodge in Tzaneen. It’s always fun to get back to mosquito netting. The monkeys outside my window in the morning were fun too. Do not let monkeys in your room

I gave a talk in Tzaneen, the day they had the national elections. They had figured initially that maybe 50 people would come hear me, but 144 people came. Surprise!

The elections were quite orderly, as far as I could tell, and it was no surprise to anyone that the government was re-elected. Everyone I talked to had a few

criticisms, but nothing major. They all recognized that governing a country with so many ethnic groups was not easy. In the US, we do not recognize that “the blacks” are not one group in South Africa. You really need to think of 50 – or more - different ethnic groups of people who happen to have darker skin color than most Europeans. As many shades of black as there are shades of white. Just as many nationalities occur in South Africa, really, as in Europe. Different wants and needs from group to group. Finding common policies is difficult. There’s always some group with some portion of their noses out-of-joint. And yet, the government seemed to be doing pretty well making people feel that things are settling down.

I met some great people in Tzaneen. The Amm family was very nice, and had me to breakfast and lunch during the few days I was there – and I got to talk EM, and compost tea with them. VERY interesting to learn more about EM. There’s some more work that needs doing with EM additions to tea.

Went up to the Lumpopo River, and went into Zimbabwe for a few moments. Saw more tomato farms there. The rest of the country was in fall conditions, but tomato were being planted at these farms. They can’t grow in the heat of the summer, but as farming in the rest of the country was going into winter dormancy, the farm here was just getting into growing season.

On our way to Durbin, we stopped and picked up a professor, retired, from the University of the North, Professor Koos Prinsloo. We had some more conversations about sustainable ag in South Africa, and he experiences with EM and other inocula. Fascinating information. I gave a talk in Durbin the next day. Again, sold-out crowd, and some great questions asked at the end of the day. Durbin was surprisingly to me. It is a beautiful setting, just like Miami Beach, or the Gold Coast in Australia. Except there’s a pall that hangs over the town all the time. I couldn’t figure out what it was – until we left the next morning, and there, next to the airport, were two smoke stacks pouring out grimy, stinking, smoke from a power plant. What could be a gorgeous city was made grimy and gritty by the smoke pouring out of those pipes.

Flew to Capetown, and drove into the wine country just outside Stellenbosch. How beautiful this area is! And some GOOD wines. Of course, I’m partial to Shiraz, but there were a couple good ones that we tasted while doing the wine-tasting jaunt the first afternoon I was there. We ate lunch in a beautiful winery – can’t remember the name, but it means “gentle moments” in English. I loved the palm trees in the vineyards, with the mountains as a backdrop. Magnificent!

Spoke to the academic crowd in Stellenbosch, and a few questions were perplexing to me. I had one agronomist ask me to basically repeat the whole days lecture. I wondered if he had actually listened at any time during the day. Must have been a translation difficulty.

It is hard for some to comprehend that compost indeed does contain adequate N to act as a fertilizer. You HAVE to have the biology functioning, in order to cycle the

nutrients in the biology into a plant available form. But they will do it, and at the same time, prevent nutrient leaching.

If you don't lose nutrients out of the system from leaching or anaerobic volatilization, you don't have to replace those nutrients the next year. S, fertilizer inputs decrease sharply, once the biology is back on-line.

You only have to replace what you took away in the crop you harvested, in these cases. So, compost has adequate N to grow crops.

How much N is in compost tea? Not much – tea tends to have no nitrate, or ammonium, but it has biology! How much N? About 0.2 g of N per 100 L of good compost tea, when proteins are considered.

If 100 L of tea was applied per HA, then 3.5 g of N would be supplied. If crops require 50 kg of N per HA, on average, then ten or more applications of tea would be needed to apply enough nutrients. Tea then can supply N, and many other nutrients in amounts needed by plants.

While in the Capetown area, we visited several of ZZ2 farms, and I have to relate an experience. We went on a field day with some grower's and brought a fertilizer salesman with us (un-beknownst to me). In the first orchard, one that had been converted to biological a year ago, there were worms everywhere. Worms were in the soil below the trees, in the grass strip between the rows, down into the soil a good half meter (they should be deeper, true, but a half meter, in an orchard that had been totally inorganic fertilizer up to a year ago - that's good!).

This made the fertilizer salesman cocky. He said "These soils around Capetown are very rich, and worms abound here. We'll find them in the inorganic fertilizer orchard, just wait and see."

The farmer who owns the farm grinned, and said, "Do you want to bet? We see worms here, but will they be in the fertilizer area?"

The fertilizer guy was adamant that earthworms would abound in the inorganic fertilizer treated orchard too. These were fertile soils, after all. So, they made a bet for a case of whiskey. The farmer would give the fertilizer guy a case of whiskey if there were worms in the continuing-to-be-treated-with-inorganic-fertilizer orchard, while, if there were no worms in the inorganic fertilizer treated orchard, the fertilizer guy would owe the farmer a case of whiskey.

So, we went over to the continuing inorganic fertilizer orchard, just a few meters away - same soil type, same past practices, except no compost for the last year. The fertilizer guy took out his digger, and.... no earthworms.

I wasn't aware that a bet had been made, so I just snorted, shrugged my shoulders, and

said, "What did you expect? Inorganic fertilizers are salts, and worms can't tolerate that kind of water stress. Of course there are no earth worms in this area. They were killed long ago, and won't come back until the high inorganic fertilizer applications end."

The fertilizer guy gave me a look of, well, whatever, and insisted he was going to find earthworms in this inorganic fertilized orchard. He dug up the grass strip, the soil under the trees, around the trees, and by the time we got done looking at the soil pit that had been dug, he was in a frenzy. No earthworms.

So the grower said, "You owe me a case of whiskey." The fertilizer guy started to hem and haw, but he had been caught fair and square. No earthworms where you use high levels of inorganic fertilizer for more than a few years.

At lunch time, the fertilizer guy and I went through a rendition of "compost isn't adequate N, P, K, S, etc to keep plants healthy". He insisted, and got a bit rude about his point of view, that compost couldn't possibly provide the nutrition for a plant. After going through the math with him, over and over, I finally stopped responding. These growers were seeing that compost did the job, got them off pesticides, and was fully capable of giving them all the nutrients, and in fact, improving nutrient levels in their apples, pears, etc.

But the best was left for last. A different grower this time taught the fertilizer salesman a lesson in humility. We arrived at a four year old orchard, with big, beautiful fruit, great yields (not yet picked so no numbers, but you could see the harvest was going to be good). The apples were solid and juicy (I couldn't resist eating one - juicy, sweet and not mushy at all). The grower looked at the fertilizer guy and said, "No inorganic fertilizer used here for nearly three years. A full two years on compost alone, without any inorganic fertilizer."

The owner of the company looked at the fertilizer guy and said, "How do you explain this? If compost can't supply all the nutrients these trees need, how can we be seeing these results?"

There was nothing the fertilizer guy could really say, except that sometimes, under some conditions, maybe compost would work. For a limited period of time. No one wanted to argue, he'd been wrong enough that day. And of course, we do have to show that compost will work, give high yields, for the whole life-time of the orchard.

But there is NO reason to expect that compost will not do the job. You have to add compost to equal the removed nutrients, make no mistake that compost-maintained systems will require input. But far less than the current inorganic regime people are following.

But the fertilizer guy was a very quiet person all the way back to town.

Good compost is the trick. Compost that is aerobic the whole way through the

composting cycle. Not stinky, not smelly, because that means you are losing nutrients.

You want compost to be a "fertilizer"? The nutrients aren't in the form of nitrate, ammonium, or inorganic forms. They are in organic forms - in the bacteria, fungi, protozoa and nematodes.

Just adding bacteria is NOT adequate. Just fungi - not adequate. Protozoa, beneficial nematodes and microarthropods are all needed. Compost supplies them all, but only if WELL-MADE, aerobic conditions are maintained.

So, the lie is that stinky organic matter is compost. It is not. If someone talks about compost as not having adequate nutrients, they don't know what compost really is.

The "compost" yards that stink are not compost yards. They are waste reduction centers. Don't buy their stuff. They should pay you to haul it away.

Buy the good material - and the results will be spectacular.

>From Stellenbosch the next day, I flew to Bloemfontain, and then to Kapama, a game reserve near Kruger Park. I saw you-name-it game – and captured them all on my camera! Lions (I could have petted them as they walked by, but I am smart enough not to want to lose my hand!), elephants, water buffalo, white rhino (with baby), giraffe, kudu, impala, warthog, zebra – you name it! But no leopard. Ah well, next time!

Back to Tzaneen, and I stayed at the Coach House this time. I walked back into my room after an afternoon walk, and there was this beetle, at least 6 inches long, 2.5 inches high, walking out of my bathroom, into the hallway. Talk about giving me a fright! Creatures! It was entirely harmless, so I put it outside by scooping it up and putting it outside the door.

We did a last helicopter tour to the compost yard and back, after we finalized the agreement for the SFI lab in South Africa.

These folks are wonderful people, and I look forward to working with them. Hardus will be coming from South Africa to train here in a few weeks. He'll be here for at least 3 months, to get everything learned. Please stop by and welcome him to the US! Or at least e-mail to say hi! And get ready to visit the SFI lab in South Africa!

SFI has been VERY busy the last few weeks, helping people get going on getting the life back in their soil. Let us know how we can help you! The Soil Foodweb Advisors are there to help you, so please remember to contact them too when you need help. They are listed on the SFI website – find the ones closest to you!