

December 2004 SFI E-zine

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Upcoming Events

January 12, 2005 class

Light Microscope Class - SFI Corvallis

8-Noon- classroom instruction 1-5 pm- Practical application

This class will give you the ability to assess your own compost teas. Discover the difference between fungal hyphae and organic matter; recognize bacteria, protozoa and nematodes.

Cost: \$200 per person (limit 10) all supplies will be provided in the class as part of the fee, as well as the new Microscope Manual, microscopes are an additional cost. It is recommended that you pre-order your microscope if you are not bringing your own. Two scopes have been recommended by Dr. Ingham. Alexis J-model \$400.00 or Leica CME-\$1200.00 (includes case). If you want to bring your own scope please contact us at the lab to discuss the specific requirements and be prepared to "upgrade" if necessary.

To register contact Twila or Matt at (541) 752-5066 or email info@soilfoodweb.com

January 24-26, 2005

Sustainable Studies Workshop

Integration of Soil Biology and Soil Chemistry

Fresno, California

[Workshop and registration](#) information pdf download

or contact Soil Foodweb, (541) 752-5066

info@soilfoodweb.com

January 26-28, 2005

Texas Organic Farmers & Gardeners Association
Announces the 4th Annual, Non-Profit
Texas Conference of Organic Production Systems
http://www.soilfoodweb.com/sfi_html/03_events/index.html

January 27-29, 2005

Sustainable Agricultural Workshop
Yakima, Washington
[Workshop and registration](#) information pdf download
or call 8 0 0 - 7 7 9 - 1 7 0 9 to register

SFI Corvallis

Dr. Elaine Ingham teaches three in-depth workshops at her Soil Foodweb, Inc. Laboratory in Corvallis, Oregon. The workshops include classroom instruction, hands-on laboratory work and field demonstrations. The workshops are listed below:
March 17–19, 2005 + October 15–17, 2005
Introduction to the Soil Food Web Workshop
[PDF registration form](#)

March 21–22, 2005 + October 19–20, 2005

Compost Technology Workshop
[PDF registration form](#)

March 22–23, 2005 + October 20–21, 2005

Compost Tea Technology Workshop
[PDF registration form](#)

In-depth [Description of the three workshops](#) PDF download.

To register download the corresponding workshop registration form.

For more information contact Twila or Matt at (541) 752-5066 or email info@soilfoodweb.com

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1. ACRES USA

Had a great time at ACRES, in Minneapolis this year. Arden Anderson and I did a three day workshop before the meeting, and then both Arden and I presented at various times in the actual meeting itself. We were both exhausted by the end of the meeting!

At least it wasn't cold during the meeting – Minnesota waited until Christmas week to be miserable weather!

As usual, there were some great speakers at ACRES – Sally Fallon, Gary Zimmer, for example. Several new speakers as well, showing practical examples of what is working. Gerald Wiebe put together a real world example from his farm of doing Albrecht-style testing combined with soil biology to get amazing results doing dryland wheat! He had soil with severe compaction problems, to the point that the soil would puddle, and not drain properly. He was going to have to put in tile to drain the field, except he started getting the soil chemistry adjusted, using an Arden Anderson soil chemistry approach, along with an SFI soil biology approach. And those areas, within 1 to 2 years, no longer have lack of drainage issues, and yields are up markedly, with less cost to him.

Many SFI advisors got together at ACRES, and during dinner and meetings in the lounge, we hammered out some ideas. Ray Gore and James Sottilo are hatching plans for a larger group meeting in Sun Valley in February, so anyone wanting to see the SFI advisors do more as a group should contact Ray or James.

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2. Long Island Organic Turf Trade Show

I gave several presentations at the Neighborhood Network sponsored Organic Trade Show. A major concern here was over the use of bio-pesticide claims for compost tea.

A couple years ago, Joel Simmons of Earthworks in Pennsylvania used the information I have been collecting about what compost tea can do to make claims about the Compost Tea they made as being pesticidal.

I have always said that pesticidal claims cannot be made, since the replicated testing showing pesticidal interactions have not been scientifically replicated. In fact, compost tea doesn't typically work in a pesticidal manner, so making those claims are un-wise in any circumstance.

The bottom line was that EarthWorks was slapped with legal actions because they did not cease making claims. This was not my fault; I explained to Joel that he couldn't make those claims.

Neal Lewis of the Neighborhood Network asked Vincent Palmer of the NY DEC to write up something that clearly explained the legal requirements, for New York, for organic pesticides

and pesticide claims. For those who want to get this fact sheet, please contact Neil Lewis at Neighborhood Network, 90 Pennsylvania Ave., Massapequa, New York, 11758

In addition, Vincent Palmer wrote up a letter to Neil about the Organic Turf Trade Show about some of his concerns with compost tea. This is quite instructive to let people know exactly what the EPA concerns are. So, from the letter, which was handed out at the show, let me quote the concerns:

“The USEPA does not exempt compost tea from pesticide registration requirements, and they will not register it at the present time because each batch contains different active and inert ingredients. There is no consistency with regard to composition. They are also concerned about the potential public health threat associated with human pathogens that might be present, and in magnified amounts, in compost tea – especially when applied to food crops.”

I liked the way Paul Sachs (pds@norganics.com) got the idea across:

Compost tea is not:

- a pesticide, but reduces the use of pesticides
- a fertilizer, but can reduce the use of fertilizers
- an herbicide, but can reduce the use of weed killers,

So, no claims can be made that compost tea is a registered pesticide. In fact, we don't want to register most compost teas, because then people would have to have an applicator's license in order to use it! Care when it comes to application onto foods that may not be washed before consumption are needed as well.

Make sure you use compost that is not contaminated with E. coli. When in doubt, test.

Elaine Ingham

3. Op-Ed Contributor: Food Without Fear

Copied from SANET. Thought this article really covered the issue that we are trying to get to by making plants HEALTHY.

November 23, 2004 By DAN BARBER

Pocantico Hills, N.Y. - Now that the bloom is finally off the Atkins diet rose, now that the instinct to, say, make a puree of potatoes feels slightly less suicidal, let us take a moment to realize that, when it comes to food, Americans have the tendency to lose all reason. With the same collective head-scratching that goes on when we look back at the big hair and shoulder pads of the 80's, we would do well to ask: What were we thinking?

This question, of course, applies not just to the Atkins diet but to pretty much every diet fad Americans have followed over the last 30 years. In addition to catchy names, these diets tend to have one thing in common: they focus on what we eat - not on where what we eat comes from or

how it was grown. Good nutrition has been conveniently, and profitably, reduced to an ingredient list. (Remember the grapefruit diet?)

That's a shame - and there's no better time to explore the ways in which we've been led astray than during Thanksgiving week, a time when Americans are particularly focused on food. (And, coincidentally, a time when we are blessedly between diet fads.) With a little scrutiny, we can see that our reductionist diet logic dissolves like a lump of sugar. Just consider the traditional Thanksgiving spread: it may appear to represent the American pastoral, but looks can be deceiving.

Start with the turkey. If your image of a turkey's life is one of green grass and rolling hills, look more closely. Nearly 300 million turkeys are raised today on factory farms where they live in windowless buildings illuminated by bright lights 24 hours a day. (This keeps the turkeys awake and eating.) The birds stand wing to wing on wood shavings and eat an overly fortified diet that enables them to reach an ideal dressed weight of 15 pounds in 12 to 14 weeks. The most popular breed is the Broad Breasted White, aptly named because these turkeys develop disproportionately large breasts, which makes it difficult for the birds to walk (if they had room to do so) and procreate (assuming they'd want to) without artificial insemination.

So what kind of bird would fit more accurately with our agrarian fantasies? Well, how about one that spends most of its life outdoors? Such birds - called pastured birds - are able to move around freely. Instead of having to be injected with antibiotics to stay healthy, they doctor themselves, seeking out certain plants at certain times of the year for pharmacological reasons. Because they expend so much energy moving around, they also grow more slowly: it takes them a month longer to reach slaughter weight than factory birds, which is one of the reasons pasturing, is less attractive to industrial farmers.

Scientific research comparing the health benefits of conventionally raised turkey to pastured turkey is scarce, but some work has been done on chickens. A study sponsored by the Department of Agriculture in 1999, for example, found that pastured chickens have 21 percent less fat, 30 percent less saturated fat, 50 percent more vitamin A and 400 percent more omega-3 fatty acids than factory-raised birds. They also have 34 percent less cholesterol.

The pasture principle isn't limited to fowl. Compared to most American beef, which is raised on a grain-intensive diet, pasture-fed beef offers 400 percent more vitamin A and E. It is also much richer in beta-carotene and conjugated linoleic acids, all of which inhibit cancer. It's also higher in omega-3 fatty acids, which are a major inhibitor of heart disease. These benefits don't exist at these levels in animal that are fed an unvaried and unnatural diet.

The pasture principle can be applied to vegetables as well. We don't live off the food we eat - we live off the energy in the food we eat. So while Mom asked us, "Did you eat your fruits and vegetables?" today we might well ask: "What are our vegetables eating?"

It seems axiomatic but it's worth remembering that in order to experience the health benefits of the roasted broccoli at the Thanksgiving table, that broccoli needs to have been healthy too. We can be forgiven for ignoring the obvious because most every diet I've seen treats a head of

broccoli the way Gertrude Stein talked about a rose - but a broccoli is not a broccoli is not a broccoli, especially if you consider how and from where its grown.

Sadly, the broccoli and the other brassicas on your holiday table (brussels sprouts, cabbage, turnips, kale, mustard greens) were most likely grown in a monoculture - a place where, with the help of large amounts of chemical fertilizers and pesticides, nothing but the crop is allowed to grow. Fertilizers are as pervasive in these large farms as tractors, especially synthetic nitrogen. And you can understand why: the chemicals bulk up vegetables beautifully and quickly, enabling them to withstand the rigors of long-distance travel so that they can arrive at your supermarket unbruised and brightly colored. But it's a little like dating someone on steroids: the look and feel may be an initially appealing, but in the end it's all kind of disconcerting.

And think what gets lost. A serving of broccoli is naturally rich in vitamins A and B, and has more vitamin C than citrus fruit. But raised in an industrial farm monoculture, shipped over a long distance and stored before and after being delivered to your supermarket, it loses up to 80 percent of its vitamin C and 95 percent of its calcium, iron and potassium.

Fruits and vegetables grown organically, however, have higher levels of antioxidants. That's largely because a plant's natural defense system produces phenolic compounds, chemicals that act as a plant's defense against pests and bugs. These compounds are beneficial to our health, too. When plants are grown with herbicides and pesticides, they slow down their production of these compounds. (Even more important, from a cook's point of view, organically grown fruits and vegetables taste better - their flavors practically burst from the ground and demand to be expressed, and we chefs merely comply.)

The same rules apply to the root vegetables, whether potatoes, sunchokes, beets, parsnips or carrots. Seek out ones grown in nutrient-rich soil for the greatest flavor and benefit. You can't buy good quality soil in a bag any more than you can buy good nutrition in a pill. Most organic farmers encourage complex relationships between crop roots, soil microbes and minerals - relationships that become wholly disrupted by chemical additives.

What about the milk and eggs that go into Thanksgiving pies and tarts? The industrialization of our food supply did not spare the dairy industry. Not surprisingly, pastured dairy cattle and laying hens produce more nutritious milk and cheese - pastured eggs in particular, with their glowing yellow yolks, have up to three times the amount of cancer-fighting omega-3's of eggs that come from factory hens.

As a chef, I am often mystified as I hear diners, rooting around for a nutrition and dietary cure, ask for this steamed and that on the side, and in the process deny themselves pleasure. Choosing what dietary advice of the moment to follow by putting a wet finger up to the wind, our patrons decide, or succumb, en masse, to a pummeling of such wearisome regularity that it begins to resemble the "rosebud" of "Citizen Kane": the clue that solves everything but means nothing.

There is ecology of eating. Like any good ecosystem, our diet should be diverse, dynamic and interrelated. In 1984 Americans were spending roughly 8 percent of their disposable income on health care and about 15 percent on food. Today, those numbers are essentially reversed. An

ever-more reductionist diet - protein this year, carbohydrates next year - ignores plant and animal systems loaded with genetic complexity, and the benefits that complexity passes down to us.

So as you're getting ready for Thanksgiving, think of yourself less as a consumer of the harvest bounty and more, in the words of Carlo Petrini of the Slow Foods movement, as a co-producer. Try to remember what you know intuitively: that we can't be healthy unless our farms are healthy; that the end of the food chain is connected to the beginning of the food chain; that we can't lose touch with the culture in agriculture (it dates back to before Dr. Atkins). To the extent possible, shop at farmers markets for your Thanksgiving foods. Try to choose diversity over the abundance that the big food chains offer. Your food will be tastier, fresher and more nutritious. You'll be able to have your cake (and your bacon and your bread and your potatoes) and eat it too.

Dan Barber is the chef of Blue Hill at Stone Barns and creative director of the Stone Barns Center for Food and Agriculture.

4. Seal of Approval Program for Compost and Compost Tea

The Seal of Approval program is meant to assist you in the marketing of your product for commercial/retail purposes. This replaces the Quality Assurance Program SFI maintained previously.

Soil Foodweb will provide a "Seal of Approval" and a listing on our website for Compost and/or Compost Tea if the following criteria are met.

1. Every 3 months test the product at Soil Foodweb for: (You are responsible for this cost)
 - a. Total Bacteria
 - b. Total Fungi
 - c. Active Bacteria
 - d. Active Fungi
 - e. Protozoa
 - f. E.coli
2. Every month test the product using the Qualitative Assay. This testing can be performed by Soil Foodweb or you (if you have taken the Light Microscope training); we only need the test results.
3. Maintain excellent results for all testing.

4. Allow Soil Foodweb to post test results on the internet.
5. Allow your personal information to be posted on the internet.

If testing fails to meet the required standards, Soil Foodweb will work with you in a consulting capacity to assist in achieving the desired results.

There is an annual administrative fee of \$25.00 to participate in this program.

Please see the SFI website for more information –

www.soilfoodweb.com/sfi_html/06_product_testing/index.html

5. Grower Experiences

a. Orchard Trees

I have been consulting to an avocado plantation here in Western Australia that had just planted 2000 avos and were having the same problem of phytophthora as well as collar rot, anthracnose and bacterial black spot when they called me. (I do not know why we are always the last to be called) What I found when I arrived at the farm (apart from a lot of dead trees) was that the trees had been planted to deep, they were watering at 90ltr/day/tree and were applying every fungicide known to man and some not yet heard of. All of this had been recommended by their **EX** Consultant.

We started by removing all the trees (both alive & dead) from the compartments, the dead ones we burnt and the live ones we went to work on. Firstly we washed the root systems clean of all soil (or sand as we like to call it in WA) then dipped the roots in mycorrhizal fungal spores; these were then put into 20ltr bags with compost treated with trichoderma spores. These were then looked after for 4 months until spring arrived. They were given on a fortnightly basis a liquid feed on humic acid, fish, & kelp liquid also small amounts of cal/nitrate.

In the paddock we went to work on the sand, 1st we applied 40kg of compost to each planting hole with 2kg mineral rock, 500gm humic acid granules, 250grms of blood & bone, all this was watered in with 20ltr of compost tea per hole and left to sit for 4 months.

At the start of spring we replanted the trees and they have not looked back since.

The trees are being watered at a rate of 80ltr every 2nd day and receive a folia application of compost tea, fish & kelp every 2 weeks. They are given a soil application of humic acid, cal/nit, fish & kelp once a month and have had a mulch of mushroom compost applied to the sand at 75ml thick. It should not be long and the cal/nit will be dropped from the program and the system will go full biological.

The growth of the trees has amazed the owners to the point they looking to bring the program to the older trees on their other plantations.

Hope this helps.

Regards
Peter Phee
Earthline
Biological Farming Systems
0895751141
0427351142
earthline@westnet.com.au

b. Mealybugs

Are there any virus or bacteria additives for my compost tea that could help kill grape and vine mealybugs?

Don Thomas

Dear Dr. Thomas:

None that have been tested. But effective biological controls include green lacewings, ladybugs, and the parasitic wasp *Pseudaphycus maculipennis*. Organic insecticidal soaps such as Safer Soap and M-Pede can be sprayed on infestations, but just to be safe should probably not be mixed with compost tea or sprayed at the same time.

Addition of certain bacterial species that are repellent to mealybugs to the compost, or the tea as possible additions, but these have not been documented rigorously with respect to these pests.

Yours truly, Brian Pearson

c. Compost Tea Brewing Manual

I'm interested to know if the manual is written in plain language. i.e. does it tell one how to ascertain when the tea is finished brewing and what good quality tea is by appearance rather than lab evaluation, etc.

For example, I've been experimenting with some brews just using a pump and barrel with .75% molasses and 10 litres of worm castings per 100 litres of water and evaluate that a brew is done and is high quality if there is a thick rubbery foam on the surface and the tea is amber (non-cloudy) in appearance.

Does the manual also include instructions for making a brewer, including how to make a venturi?

Cheers, Tim Wilson

Dear Mr. Wilson:

The appearance and odor of a brew can be valuable indicators of quality, but there is much they don't tell us, which is why testing remains important.

We can know when a brew is "done" by monitoring temperature and dissolved oxygen levels. As bacterial activity peaks then levels off, we see the high temperature reached drop back toward ambient and the diminished oxygen levels rise back to 7 or 8 ppm.

Thick surface foam may indicate that a high bacterial biomass has been achieved, but clarity or cloudiness may reflect nothing more than the amount of fine particulate matter which escaped the compost and became suspended in the liquid. Very fungal teas (which are most beneficial, but difficult to achieve) may be inherently cloudy. A good tea may smell sweet, spicy, earthy, mushroomy or even like the sea, depending on compost and supplements used, but will never smell rancid, putrid, nauseating, etc.

The principles of brewer design are addressed, but not in a "how to, from scratch" manner. So no venturi instructions. I should mention that in brewers up to 100 gallons, a forced water circulation system may not be needed anyway. What is essential is plenty of moving air--fine foamy bubbles through the tank to keep the liquid oxygenated, and larger bubbles through the compost to agitate it and get the microbes loose.

Yours truly, Brian Pearson

d. Composting

Dear Brian,

I am located in a rural area of southwest Oklahoma. I have a small – elevated backyard vegetable garden (mostly tomatoes). I am intrigued with the concept of foliar feeding and I try to stay as organic as possible. My question is in regard to cattle manure. Through activities in the AG dept at the high school, I have access to manure at the barn where show steers are kept. I would like to know about the time needed for proper decomposition to take place so that the manure will hopefully lose undesirable microbes (I forget the proper name for that kind of bacteria) . I am concerned about making a compost tea and then spraying it on my plants which will then be eaten by me and my family. So that you will know the kind of climate that I live in; the Oklahoma sun bakes things pretty fast and we get very little rain. Could you please advise me? Or suggest a source which can be read giving me this info. The local veterinarians seem to not have this information. I have ordered the Compost Manual but it hasn't been received yet. Thanks for the help.

Sincerely,
Steve Gifford O.D.

Dear Mr. Gifford:

You can make good compost from cattle manure, either thermally or with worms. There are a number of composting bins available commercially, or you can build your own from plans readily available on the internet.

The easiest thermal composters for the home gardener are the tumbler type, where you can turn the compost simply by turning the barrel on its axle. Your local garden supply center probably has several models. You still need to monitor temperatures in the center of the pile to know when to turn (after 3 days at 131F should eliminate most pathogens). But the closed barrel prevents moisture loss from evaporation, so be careful not to add too many vegetables, or add enough wood chips or sawdust or paper or cardboard to soak up any excess moisture.

Compost is mature when it is dark brown, crumbly, with a fresh earthy smell.

Worm bins are simple--a box up on legs with a metal mesh bottom. Getting started, you add bedding material such as peat moss and the worms, then put the food in the top. The worms will work in the top layer of food and their castings sink to the bottom. Shake the bin over a collecting tray to harvest the castings. Worms can cook to death if it gets too hot, so keep the bin in a shady area, covered with light colored reflective material, and add water regularly to maintain around 50% moisture.

Pure manure does not make very good compost--it comes out extremely bacterial and high in salts--so you definitely want to interlayer manure with cellulose sources such as straw, wood shavings, dry brown leaves, etc. (Worms can't handle wood chips very well, but do fine with leaves and straw). All your lawn trimmings, vegetable food scraps, etc. can also go in the compost.

I do have some concern over your manure source. You might want to find out how these cattle have been medicated. Hormones, steroids, etc will be broken down in the composting process, but antibiotics can harm the microbes that turn the manure into compost. Also, if the cows have been wormed recently, the vermifuge residues in the manure can kill worms in a worm bin.

Yours truly, Brian Pearson.

e. Compost tea machines

Steve Hargis wrote:

Like so many other people I am on a budget and your info., and organization I have found, is very respected, in the organic industry. I am a do-it-yourself kind of guy, when I can. I have just started the compost tea project as a spin off of selling high quality chicken litter compost. I want to make up to 500 gal. at a time of tea. I have researched several machines and I am now looking hard at the simple system from Northern the Bro something....

Why can I not buy a high volume air pump, add my sack of compost and sugar to my 500 gal. pasture spray tank, cook and then spray all with the same unit? I will continue to do this system if you agree, until I get results, I can show other rancher and farmers in my area. I have received very impressive result from my barrel and sack system butt that is to much work for a large volume as you will know...

Brian, am I on the right track or not? Just tell me like it is, I am wanting to learn from the best.

Sincerely, Steve.

PS I had only added 2 small packs of yeast to my tea and twice as much sugar than yeast. My container is approx 20 gal. If I stir my solution and add a cup full of sugar along with my continuous air supply, will my good bacteria come back ,in say 6 hours or so. I am cooking in a dark warm barn.

Dear Mr. Hargis:

Brewing directly in your spray tank might work, but with several cautions. First, only fill the tank about 3/4 full of water so there's good air space at the top. This much liquid is hard to aerate properly, so you need a pump that moves lots of air and a diffusor at the bottom of the tank that produces many streams of small bubbles. You should probably also have a separate air source, that makes larger bubbles, inside the compost bag itself to provide agitation and extract the fungi.

Use non-chlorinated water, preferably from a well but pond or creek water will do. Many counties now add chloramines as well as chlorine gas to the tap water, so airing out the tap water may not sufficient. The residual chloramines may reduce microbial growth in the tea by a factor of 10!

I hope your tank is easy to open up and clean inside, because with repeated brewing an anaerobic bacterial slime can build up--especially in all the little corners and crannies--and ruin future batches. Running hydrogen peroxide through the tank, followed by a rinse of clean water, should clean it if you can't get in and give it a good scrubbing.

As for foods, you won't need all that much sugar, preferably a blackstrap molasses (a cup per 50 gal, or 1 or 2 pounds max for that much water), especially in the summer when bacteria grow fast anyway. Getting the good fungal levels is harder. For that large a brew, you'll need about 3 or 4 quarts humic acids, and about half that much soluble kelp. Fish hydrolysate is also a good fungal food, which could be added at about the same rate. It requires more care as it can also feed

certain anaerobes and get very fishy smelling.

I'm not familiar with the brewer you mention. Do you mean Bob Norsen's larger machine? Because that is a good machine--we have seen consistently good tea come from it.

Look at "Advising Services" on our website to find the SFI Certified Advisor for your geographical area. These folks are professionals with many years experience in farming or agricultural consulting, and are fully trained in the SFI approach. They can help you set up the best tea application program for your particular situation. I would also strongly recommend that you obtain our new Field Guide for compost tea (under "Products") and possibly also the Compost Tea Brewing Manual. These books will teach you all you need to know--maybe more than you ever knew there was to know--about CT.

I would also recommend that you have us test your compost and your tea so we can make sure they are appropriate for your applications. In our experience, chicken litter composts tend to be bacterially dominated and often high in salts. These problems can be alleviated by adding more cellulose material (straw, wood chips, dry brown leaves, etc.) to the starting materials to feed the beneficial fungi.

Thank you for your interest in SFI and in compost tea. It's great to see more and more farmers going that direction and enjoying improved yields and higher profits!

Yours truly, Brian Pearson

Subject: Can I use yeast Advice needed ASAP I have tea cooking

Hi, I have just started into the compost tea scene. I am not able to get unsulfured molasses. Can I substitute yeast for molasses and how much yeast per gal. of tea do you recommend.

Thanks Steve Hargis

Dear Mr. Hargis:

If you cannot get the right kind of molasses, try using barley malt extract or raw sugar. This is to feed the bacteria. You do not want to add live yeast because it can break down sugars which are already present and produce alcohol, which is toxic both to the other organisms in the tea and to the plants you put it on, if the organisms grow so fast on the sugar that the liquid becomes lacking in oxygen.

Yours truly, Brian Pearson

f. Testing for biology in soil.

Dear Ms. Munro:

1. I want a baseline report on a one acre field that has been fallow for the past 13 years. Prior to 1991 it was in sugarcane and likely had all the chemicals dumped on it. Currently it is in grasses and weeds. So, how healthy is my soil?

The populations and ratios of the soil microbes will tell the story. The more life the soil supports, the healthier it is. Given the description of your field, I will take a guess that the soil is bacterial dominated, lacking in fungi and

possibly in protozoa and nematodes. Your test results will let us know what's there now, and suggest a direction for amendment. You may also want to have a chemical testing lab check for pesticide residues, [if you are seeking organic certification](#).

2. What level of harmful nematodes do I have? I'm particularly interested in these guys:

Ditylenchus sp.
Helicotylenchus sp.
Meloidogyne Primer
Mediodogyne sp
Pratylenchus sp
Radopholus similis
Rotylenchulus reniformis
Tylenchorhynchus sp
Xiphinema americanum

We will extract the nematodes from 100 grams of your soil, count them all and identify a significant sampling to genus (not species). Then we calculate how many of each you have per gram of soil. This information appears on your report.

3. What level of these harmful fungi do I have?

Coniothyrium zingiberi
Fusarium Primer
Fusarium oxysporum f. sp. Zingiberi
Fusarium solani
Fusarium sp
Phyllosticta Primer
Phyllosticta zingiberis
Phyllosticta sp
Pythium Primer
Phythium aphanidermatum
Phythium graminicola
Phythium sp
Rhizoctonia Primer
Rhizoctonia solani

4. What level of these bacteria do I have:

Pseudomonas Primer
Pseudomonas solanacearum

We can identify fungi and bacteria to species, as do many other labs. Check with your local extension service to find one that offers these tests. Otherwise, send samples of the materials you want to test into the lab, and we'll do the ID's.

In general, though, let me warn you that any soil, or compost you test will likely have DORMANT stages of the pathogens that will be found. This is not a surprise, and actually should not be of much worry. If the bad guys are sleeping, you care if they are present.

5. I want to grow zingiber officinale for commercial rhizome production, and will seed the field in March 2005. Can you tell me what (and how much) minerals I need to add to my composting to build the soil for the next 8 months? How much should be added to 1 acre? What sort of compost tea schedule can you suggest? What should my target levels of good bacteria & fungi be in 3, 6, 9 months with this program?

Dr. Ingham has worked with several ginger growers in Hawaii, and knows the specifics. I have forwarded these questions to her.

You may also wish to contact Mr. Chuck Boerner who is our SFI Certified Advisor in Hawaii.

Yours truly, Brian Pearson