June 2004 SFI E-zine

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1. ICTC MEETING COMING UP IN SEATTLE on July 16. Please see their website: www.intlctc.org

Some exciting speakers will be present! I am just one of the speakers, so to hear about what the other folks are talking about, please check the website. I'll be talking about….

Lawns….

But I will also talk about how to EASILY assess coverage of any leaf surface. Don't have to send samples to SFI to figure this one out anymore. What other lab teaches you how to do-it-yourself? The method I'm talking about is the red dye method. We have some testing to do to make sure this works well, and I hope that people can help me to some of the testing needed to see when and where the method works and where it needs some fine-tuning.

I will bring the materials to demonstrate the method along with me during my demo in the afternoon.

I'll will also bring a "little" microscope with me, and demo it's use. This is used to determine QUALITY of the tea. Show yourself, each batch, or each time you buy a tea, whether it is bad, poor, or superb! The new Compost Tea Quality Manual: Lab Microscope Methods, goes through the standard curve we've developed at SFI.

I won't be giving a class at the meeting. The logistics were just ugly to get it arranged.

The focus of the meeting will be lawns, and I'll talk about the home-owner version, as well as parks, sports fields, and golf courses, pastures too. I'll show some of the work we’ve been doing in Australia – we’ve been very nicely successful with the Gold Coast in Oz. Not perfect, of course, but we are learning how to do this on large scale. All initiating from the on-going work at the Mirage in Las Vegas (Tom Jaszewski spoke at the last ICTC about this), at Bandon Dunes, at several golf courses that Charlie Clarke works with, and so forth. The examples of success are becoming more and more widespread, but in each case, the biological approach has to be adapted to the specific conditions of the site. And that’s what we have to teach the attendees at this meeting.

2. Organic Independence Day Farm Tour, July 4th

Learning and networking with others in growing your own food
A day on Steve & Diana's beautiful Certified Organic Vegetable Farm,
nestled away in upcountry. You will be experiencing the following:

- Guest Speaker - Dr. Elaine Ingham the "Diva of Soil Micro Flora"
- Soil Food Web analysis from our featured speaker Dr. Elaine Ingham. She will have on hand a microscope for participants to see the micro flora activity of compost tea, along with delving into the inner working vitality of this organic farm
- Mineral and element analysis of Bob Shaffer, Soil Culture Consulting.
- Organic continental breakfast & lunch - Door prizes
- Dried Papaya Seed Testing by GMO Free Maui
- HOFA Inspector on site to answer questions about getting certified
- Educational information - Raw Food Demo
- Participants will receive a bag of black gold organic mix, a bag of Kumulani's greens. And a day of organic inspiration being at a place that is filled with upcountry charm and vitality.

This organic farm tour is the only one of its kind offered here on Maui. The admission fee affords you to be part of something special, which will serve your best and highest interest in caring for your self and the Aina. What you walk away with will far outweigh the cost of being there. If you want something to change in your life do something different... give the gift of this event to yourself and or share it with a friend. There is something to be said for being around organic culture, tasting its harvest and spending time with a group of people that value what is life giving to both their bodies and that of the soil. We at MA'A are holding this space with thanks and appreciation to Bob Shaffer Soil Cultures Consulting, Dr. Elaine Ingham "Soil Food Web", Steve and Diane at Kumulani Farms.

Directions - From Makawao town go up Olinda Rd. to mile marker 11. Look for signs and follow the parking guides.

*Ma'a would like to thank its sponsors: Office of Economic Development, The Maui Farm Bureau, and all of you who "value the mission".

E-mail us at mauialohaaina@yahoo.com

3. Texas Organic Farmers and Gardeners Association, July 8-10

Dr Ingham in a three day advanced Soil Boilogy/Soil Chemistry Course
The Center for Environmental Research, Austin Water Utility, Hornsby Bend Biosolids Management Plant
Austin, Texas
Cost $425
Download a printable PDF workshop flyer for details.

Contact Louise Placek, (877) 326-5175 (toll free)
or email louise@texasorganicgrowers.org or www.texasorganicgrowers.org

4. Yard health and how to fix it

I have been a bit focused on other things than my yard for the last few years, so my yard's health has been going "back-wards". Weeds have increased (to about 10 composites, 3 clover per square yard!). All those cute little yellow flowers that turn into fluffy seed balls. Strangling vines. Clover, crab grass, thistle, the 101 weeds of the Northwest….in my yard. I've enjoyed (!) watching the succession of weeds happen and I can see that nature is moving my yard in a certain direction – the weed species have changed over the years. Used to be mainly chickweed and one kind of thistle, now it's a different three kinds of thistle and white clover. Yellow clover is winning in a couple places. What fun! That's sarcasm, in case you couldn't detect it.

Why would my yard go "back-wards" in a health sense? Because soccer teams were using my yard as a practice field. Both my son and daughter were into soccer, and my husband managed their teams. So our backyard developed compaction.

And think about the fact that this is the Pacific Northwest, where we get enough rain that SAD disorders run rampant in the winter. We don't see the sun from late December to mid-April. This year, the rain has only just stopped, now, in June. (What is that yellow ball of light in the sky? Not sure, I think it might be, yes, it is……! Nope, it's gone now! That could have been the sun, showing up for it's once a year viewing….). Wait – that's rain out there. Did I say the rain has stopped? Nervermind….not summer yet.

We like to make it sound bad, so the rest of the country won't join us here in the PNW. But if you need sunshine, this is not the place to live. We get rain in all varieties, variations, levels of intensity, and more. We have more words for rain than any other state I know, except for maybe Washington State. Yep, western Washington gets MORE rain than we do in Oregon! Hard to believe, but it's true. What do you do in Seattle for a good time? The Space Needle is ABOVE the rain clouds…. Why do you suppose they built it that way?

The point being, rain compacts soil. Don't believe me? Stand in the pouring rain sometime. Those drops impact pretty hard on your head. Think what it can do to unprotected, no-organisms-to-hold-things-together dirt. Heavy rains will eventually compact soil – even with good sets of organisms, if those organisms aren't well-fed. In tropical systems, rainfall may be the biggest compacting event, worse than the impact of heavy tractors.

Mother Nature disturbs systems all the time. You have to maintain the biology in order to prevent those disturbances from eventually impacting your soil's health. You need a plant overstory to intercept the rain drops. Nature typically protects soil by making sure it's covered to the maximum level. In high rainfall areas, that may be what weeds are for – they feed the organisms in the soil and intercept rain so it doesn't compact. Then nature can get on with the job of changing the soil so later successional plant species can survive, and continue building more, and better, soil.

We also have a herd of deer that lives in our backyard most of the summer. They love the moss area under the pine trees. Moss, which tells me that my soil is as compacted as it can possibly get, that there's no iron available to the grass under there, that calcium is long gone and not-available to the plants, and we're moving in an acidic direction pH-wise, because of the anaerobic processes that occur as soil gets totally compacted. Heavy clay soil doesn't help things.

My yard used to be a bog. It was drained before the developers started building houses. There was once a pottery business on the area where my house now sits. When we moved here, we had to do an Army Corps of Engineers thing in the yard first thing. The backyard was about 3 feet deep clay-water mixture the first winter. The grass was practically non-existent.

I had lived in Colorado for 8 years, and the amount of water coming from the sky in Oregon in one winter was more rainfall than I'd seen the entire 8 years we lived in Colorado. The amount of water was a bit of a shock. Yes, serious clay, and compaction to go along with it. No available calcium. No iron, because the soil was anaerobic. When we dug down into the soil, at about 3 feet, the soil's color was bright blue. Yep, anaerobic…..

After constructing drains throughout the yard, and breaking open the sill of clay that prevented the backyard from draining to the street (a drop of about 4.5 feet from the backyard to the front), I built up the soil, to the point that I had no weeds and didn't put anything but compost on the yard once every few years. Everyone in the neighborhood admired my rhodies, azaleas, roses, fruit trees, iris, blueberry, and raspberries. The neighbor kids grazed in my yard all through the spring.

And then I started a small business, and my yard has suffered. I was involved with some unpleasant people, who tried to destroy my business and reputation, but that is being resolved by all you folks that are having success with getting great biology back into the soil, and in doing so, exiting the chemical dependency trap (which doesn't mean NEVER using any pesticide or inorganic material ever again – it means stopping being totally dependent on that sad situation).

So, now I get to recover my yard's health, and in doing so, get to relate how-to-do this for everyone!

The problems are:

1. compaction as evidenced by the weeds that are present.
2. foliar diseases, such as Phytopthora on the rhodies, scab on the apples, botrytis on the cherry, raspberries and mummy berry on the blueberry.
3. scale insects, aphids, snails.

Fixing the problems:

Compaction is the first issue. The soil gets so hard in the summer that even the kids' cleats won't hold in it. The on-going compaction is still happening – foot traffic, deer herds (I have just about turned a couple deer into pets – they love me to cut leaves from the Granny Smith apple tree and put them down where they can eat them). And rain, rain, rain has beaten the soil into something that the trees have given up on too. Their roots are up at the surface these days, not down into the soil anymore.

Two years ago, I had a student apply tea to the lawn. I was wondering if the student was observant of what they were doing, or just going through the motions. Yep, just going through the motions – they never made an effort to observe whether the tea did anything positive.

No effect of the tea. I started trying to figure out why. When applied to a dry soil, the tea only soaked in the top 2 or 3 mm, which is about ¼ inch. The soil then dried down and I saw no benefit. So I watered the lawn, to try to bring the organisms back to life.

Some of the thatch broke down, but we didn't get any improvement in soil structure. Hum, had to deal with the thatch first. How do you know if you have thatch? Rake your lawn – if you rake up lots of dead grass before you hit the soil (or in my case, rock-hard material), you need to deal with the thatch problem.

We applied a final tea in the fall, when the soil was already moist, and then I saw a small improvement in soil structure, just at the surface. Weeds became easier to pull, and the dandelions went away as I put eggshells out on the soil surface. The eggshells disappeared rapidly.

I got distracted by other issues, and I did not have the student continue with the tea sprays the next summer. They weren't paying any attention to the fact the tea was not improving things in my lawn, they were not testing their teas in any way to prove to me that they were making good tea. So I ended that experiment. My lawn received no attention (barely even mowed it much last summer).

Now, here we are, this summer. Compaction is worse than ever. Application of eggshells doesn't begin to deal with the dandelions. Addition of calcium has exited the thistle, but the composites? Not one bit of effect. Does that mean I don't know what I'm talking about with calcium? No, it means things are so bad, that addition of a little calcium isn't enough.

During the late winter, early spring, when pulling weeds by hand, the roots would break off at the soil surface. The soil was so compacted, even when wet, that the roots were so strongly held, the roots would not pull out. The calcium to magnesium ratio was so out-of-whack that a few eggshells was laughable.

So, a local commercial compost tea maker, Shep Smith, put out an application of tea using calcium-enriched compost, a month ago. That was during a dry spell, and the tea didn't soak in far. But it did start dealing with some of the thatch that had developed. Took out some of the moss. But that was about it.

He applied again last week, after we had a good week of drenching rain.   The weeds are coming out much easier. The compaction is finally being alleviated.

I have line of demarcation in my lawn where last fall, I put eggshells on one side, and did not put them on the other. I have no dandelions or composites on the eggshell treated side now, but oodles of dandelions and composites on the other. I have pictures, which I'll try to put up on the website.

In order to hasten the return to health, I need to get more serious about breaking open the compaction areas and getting more calcium into the soil.

Step one. Add calcium to build soil flocculation, which is step one in all this. How?

1. Add calcium to the compost. How?
2. Two to three weeks before use, add a handful of calcium carbonate (lime) or eggshells to the compost you are going to make tea with. Add some fungal foods to rev up the fungi – fungal foods like fish hydrolysate, or humic acid material. I really like the Turf Pro product for a liquid humic acid, the Terre Vita dry humic acid product (wow! The fungi love both of these products, if you have good fungi present).
3. No fungal response to the addition of food alone? Get some Alaska Humus into your pile. Add fungal foods, and additional calcium.
4. You buy compost? Talk to the person making the compost and see if they won't do the additions for you. No? Then buy some of their compost, add the Alaska Humus, add the calcium, then the Turf Pro, and wait two weeks. Should see lots of good fungi. Oh, remember, keep the compost about 50% moisture (just barely able to squeeze a drop of water out of the mix). Might want to mix a few wood chips into the pile to help air movement through the pile.

5. Can’t do either of the above? Then add fish hydrolysate that is high in calcium (Organic Gem, for example, or maybe Geofish – ask them for their data first!) to your tea AS IT IS SPRAYED OUT.

Step two is to add compost or compost tea high in fungi. Monitor how bad your lawn is – can you pull weeds and get the roots out? Push a metal rod into your soil – how far can you go? I can’t get more than a couple cm, or one inch, into my soil. Yep, it’s bad. The weeds and moss are telling me, it’s bad.

To speed conversion, I’m going to rake my lawn to remove whatever moss, weeds, and thatch that I can. It’s that bad that when I rake, I remove moss, weeds, and clover equal in volume to the grass that remains behind. I was nearly at “let’s rip the ha-ha lawn out and start all over”, but let’s see if I can resuscitate the lawn without having to be drastic.

I’m thinking of this exercise as “The Homeowner’s Alternative to the Athletic Club”. If I come home and spend an hour raking each evening, I don’t need an athletic club. I have my built-in body-building exercise right out there in the lawn.

If raking doesn’t do the trick, then I’ll aerate the lawn with a push-aerator. They can be rented for a reasonable cost, and I should be able to do my lawn next month, after I’m back from Texas.

The next tea spray on the lawn will be mid-July, so that will be good timing. I can rake for the next month, a little bit at a time. Aerate if the compaction doesn’t improve and start to go away. Apply compost with the calcium added. Then aerate just before the next tea spray and observe if the response of improving soil structure is faster if I physically put the organisms down around the roots.

So, I have 10 pounds I need to lose. This should get me and my lawn in shape. I’ll keep all of you posted!

5. FOOD QUALITY

Pre-packed fruit lacking in vitamins – report.
http://foodproductiondaily.com/news/ng.asp?id=52669&n=dh161&ec=udzflpstxiinvbc
FoodProductionDaily.com 09/06/2004

An investigation into prepacked fruit and vegetables stocked in UK supermarkets found that many had vitamin C levels far below normal for unprepared produce.

The report, published by the UK-based Consumer’s Association in last week’s issue of Which?, notes that supermarkets dominate British fruit and vegetable supply but that they often place more emphasis on looks than taste.

Asda sliced runner beans, for example, contained just 11 per cent of the textbook level of vitamin C, and Marks & Spencer's fresh mango contained just 42 per cent.

Malcolm Coles, editor of Which?, said: “Supermarkets should give shoppers more information about where their food comes from, how it's been prepared and how nutritious it is.” The report offers further evidence that the British public may not be getting adequate vitamin intake through their daily diets. It claims that nutrition is not a priority for many supermarkets, pointing to research that found vitamin C levels in some pre-sliced and packaged supermarket fruit and vegetables were far below normal levels for unprepared produce.

The UK's food authority says that adults need 40mg of vitamin C daily although some research suggests that higher amounts can offer important protection against disease such as cancers.

But vitamin levels in fresh fruit decrease after they are picked, and particularly after they have been cut and exposed to air or sunlight. Much of the peeling and chopping of ready-prepared produce is now done abroad and the food then undergoes a long journey before reaching British supermarket shelves.

6. FROM THE COMPOST TEA LIST SERVE

From Jeff Lowenfels:
> PRESS RELEASE
> For immediate release
>
> Contact: Amy Steigman
> American Phytopathological Society
> Phone: +1.651.454.7250
> Web: http://www.apsnet.org/meetings/2004/media.htm
> E-mail: mailto:asteigman@s...
>
Keeping your peas and carrots safe to eat
Plant pathologists present research on food safety at APS Annual Meeting in Anaheim, California

St. Paul, MN (June 8, 2004) - Recent advances in food safety research are enabling plant pathologists to gain insight into how dangerous human pathogens, such as strains of E.coli and Salmonella, can survive on fresh fruits and vegetables and what can be done to control future outbreaks.

According to Steve Scheuerell, faculty research associate at Oregon State University Department of Botany and Plant Pathology, there has been an increase in reported human disease outbreaks associated with fresh produce over the last couple decades. "When an outbreak occurs, most of the infected produce has already been consumed," said

Scheuerell. "Usually recalls won't help. This is why prevention is key to keeping food safe," he said.

To reduce the potential for the transfer of pathogens to fresh produce, plant pathologists are stressing the need to implement and maintain sanitary growing and harvesting conditions worldwide. "As the U.S. increases its importation of produce, it is increasingly important to us that growers everywhere have good quality irrigation water and sanitary conditions for their workers," Scheuerell said. "On the domestic front, the National Organic Program has taken the lead in implementing proactive measures to prevent potential contamination of fresh produce with human pathogens,"

Scheuerell said. Examples include mandated pre-harvest intervals for the application of manure and proposed quality assurance testing regulations for compost tea regulations (a brew of compost with water used as a biocontrol agent or fertilizer). "Using techniques developed by plant pathologists, scientists are just beginning to understand how human pathogens colonize leaf surfaces, and how their survival can be influenced by manipulating leaf surface microflora and environmental conditions," he said.

Plant pathologists from across the country will present more on this topic during the Food Safety as Influenced by Phyllosphere Microflora symposium at the APS Annual Meeting in Anaheim, Calif., July 31 - August 4, 2004. The food safety symposium will be held Tuesday, August 3, 2004 from 9 a.m. to 12 p.m. at the Anaheim Convention Center, Anaheim, Calif. Members of the media are invited to attend annual meeting events; complimentary registration is available.

The American Phytopathological Society (APS) is a non-profit, professional scientific organization dedicated to the study and management of plant diseases, with 5,000 members worldwide.

RESPONSES FROM MEMBERS OF THE COMPOST TEA LIST SERVE -

Elaine's note -
I include the following notes from Dennis Kremnitz and John Cowan, because they express important points. Science was moving in the direction of understanding soil biology back in the 1920's and 30's – until the pesticide industry started up, and then poof! Research on the organisms in soil went away, almost overnight.

Why study the organisms if we can just nuke them out of existence? Well, human short-sightedness….. We NEED those organisms in soil to do other things than just protect from the pathogens! So, Dennis and John's comments are similar to my sentiments…

Sent: Tuesday, June 08, 2004 3:39 PM
To: compost_tea@yahoogroups.com

The only harvestable peas I have this spring are the ones I soil drenched with ACT about the time they came thru the ground. The other 3 rows (control)have nearly nothing on the vine to harvest. The peas are an Oregon snow pea so they might have responded to ACT better than others (just kidding). I even cooked them (ever so slightly)in unpasteurized cream and in a nutshell, delicious.

Dennis

PS what do you folks think of the press release from the American Phytopathological society? I think they wouldn't have sense to come in out of the rain!

PSS Upon re-reading the press release I wonder if they know humans survived before refrigeration, pasteurization and immunizations? I don't know exactly how they survived BUT I'm not an 'ologist' of any sort. I tried to be a food technologist for a while til I gave it up for "wanna-be organic farming". I did live on an organic farm beginning in 1949 and we survived on the family farm eating chickens, milk, garden veggies and eggs none of them irridated, pasteurized or acidified by Cargill, Tyson or Monsanto. Anyone ever notice how fast those chopped ready-to-use salads from the corporate grocery stores get slimy? Man they gotta be loaded with about 25000000000 CFU's per gram!

A second post -

You have to wonder about people that JUST study plant pathology (or any other pathology). How about studying plant health and how that is maintained?? How about how to make a healthy plant healthier!?!

My compost tea-fed snap peas came through amazing considering I live in the high desert and it was outrageously hot, windy and dry this spring. The window of harvest was maybe three weeks. Many pods were set two to a node and the plants were loaded.

John Cowan

Another Elaine note -
Jeff Lowenfels also brought up a good point in a later post. We need the concern about the pathogens and the problems with current toxic chemical ag practices. Steve Scheuerell points out a current concern which the compost tea industry needs to address. Ostrich-like ignoring problems with human pathogens will not protect this industry. Funding is required for research, and the more everyone can express that concern to their Congressional Representatives, the more likely we will get funding for biological approaches.

So, please, keep sending those phone calls and letters to your congressional delegates. It’s what they are there for you know! Express your opinion!-

7. GROWER EXPERIENCES

E-mail from Bob Norsen -

It is certainly much easier to measure the microbes than to evaluate what the ACT is doing to the plants. It takes time to measure a response in plants. Like Elaine was saying it took years of testing, with application and observation to determine what is good and what is not good enough TEA.

My yard and garden is one where the garden had to be blended with the landscape. (Her request) So we have Rhodies, strrawberries, roses, blueberries, grass, fruit trees, Oxalis, raspberries, our worm bin, apples tree, iris, plumb trees big cedars, all growing in what is - well we like it. At the start 23 years ago we added some putrid grass clippings to the basic heavy clay soil. Dug some in (this was way before I was aware of the Soil Food Web. The empty lot had been the local clippings & yard waste dump for years,) We got fair results. When Giovani started his compost work we added 2 " of compost to some areas. And we applied ACT a couple times in 2000.

Also applied ACT once in 2001 and 2002. Year 2003 I made a lot of ACT to test the CACT cycle. Applied much of it on my own yard & "gardens".starting in mid summer. Didn't get much in the way of results. Fruit crops were poor. Strawberries had blossoms and started to bear but the berries were small. Blueberries from 12 large plants fed the robins plus one breakfast treat. Fruit trees had a small crop that tasted good. I wondered if my ACT was effective. It tested OK at SFI.

This year is different. Heavy fruit load, berries are bigger, but not ready yet. Plants look better. It is still too early to know how the summer will go. Conclusion to date - it takes a season to change what this type of plants do. This year we are testing the mobile BobO500 so the yard is getting good applications of ACT.

In my neighbors raspberry area where the vines were all about alike when I sprayed in 2002 & 2003 I sprayed the North 2 rows and the South two rows. Left the middle 6 rows with just the level organic fertilizer that was applied evenly entire 'patch' in 2002. In 2004 the North 2 rows are 6 times the size and productivity of the middle rows. Weeds did well in all areas. The south 2 rows are 4 times the size and productivity. I will show pictures later.

The problem in my own raspberry "patch" is the plants grow so lush I have to cut them back hard to find my way thru to pick. Need to leave more open space between initial planting. Plums, peaches, apples are heavy. Blueberries - I defy the robins to fly away with enough to make a difference.

It took a season with several heavy applicatons o see results at my house, but it changed!

Bob

Tim reports -
This spring I made a 100 gallon brew. It was going to spray it on after 2 days. Due to weather I brewed it for 6 days. On the morning of the sixth day it smelled like soil but when I got home from work that afternoon, there was really no smell coming off the tank....good or bad. As I pumped it out and got closer to the bottom of the tank it was starting to smell, not good. Well I sprayed the whole tank on my yard. It seemed to damage the apple trees the most. Parts of the leaves turned a dark brown, didn't seem to affect my other plants.The apple trees at this point have no sign of any damage, I sprayed in the beginning of May.

Some examples
Started making tea 2 years ago

My own yard sees about 150 to 200 gallons a year(It gets whats left from spraying other yards). My yard has never looked better.The apples off of my tree were bigger and better than ever last year.Never saw and aphid or Caterpillar in my yard last year. Tea??? or maybe just the year, we will see this year.

I spray yards for friends and family.For 2 years previous to spraying tea one of my apple trees had clumps of like a white cotton growing on parts of the branches, I still haven't ID it. I only sprayed tea and its totally gone now, there was less and less as the year went on.

When I spray gardens, I only spray 1/2 of it. Great results. Cucumbers on the tea side 3 times bigger than the unsprayed side.
I spray 1/2 of the neighbors lawn who lives next to me, he takes care of the other side with his chemicals. I would say at this time, tea side is about 10% better. Only had 2 small applications.

I've always had a silent battle with the guy across the street on..... who's lawn is the nicest his or mine?

Watching our lawns last year you could see the difference. I could really see the stress in his lawn about 2 weeks after he fertilized and he watered alot more than me. I'm spraying his yard this year.

I am starting to see the results of all my experimentation. I would sure like to see more views and experience from people who are spraying tea regularly.

8. **Two other Compost Tea papers published**.
In the world of academia, new ideas are often greeted with skepticism. Some ideas more than others, but most of the time, truly new ideas are rarely welcomed with open arms.

The expectation is that other researchers will test new concepts. Of course, those researchers who are honest about their efforts will learn about the method being presented and properly test the new concept.

A couple researchers have made versions of compost, and report positive results. They have, however, not exactly managed to meet the parameters set forth in the COmpsot Tea Brewing Manual, however.

The critical thing demonstrated by my work is that THE BIOLOGY has to be present in the tea, in order to know that the tea will do its job. But at least these researchers have verified disease suppression as being an important part of what aerobic liquid tea brews can do. Note that the work by Al-Dahmani et al is an AEROBIC situation, with aerobic organisms growing in the extract. They say that oxygen concentration was not important, but what they don't tell you is that their extracts stayed aerobic in all cases, so they didn't really test the concept that we have pointed out is important with respect to oxygen. Addition of mature compost to water, with or without aeration, rarely results in anaerobic situations. The point of adding foods is to GROW the beneficial organisms you want, but that leads to an oxygen demand. No food addition, no increased oxygen demand, no anaerobic teas.

But, to all those nay-sayers out there, you'll have to stop saying that there are no publications showing that tea works. The Compost Tea Brewing Manual was the first, but by no means the last.

I want to hammer home the point out that to repeat and test the work I have done requires determination of the BIOLOGY present in the tea. Utkhede and Koch used an application of a mix of beneficial species, but their compost tea was as effective as any combination of known-beneficial species at suppressing disease. Still, their paper shows good comprehension of the fact that it is the BIOLOGY that is important.

To demonstrate that a scientist understands the scientific method, they need to follow the protocols that we have developed that will result in the compost tea having good biology. If they just throw compost into water and stir it around, they have not followed our methods for making good tea. Those folks saying compost tea has E. coli, or that molasses causes E. coli to grow, aren't following the protocol we have described, so they aren't following the scientific method. They aren't making aerobic compost tea.

No data on oxygen concentration? No data on oxygen concentration through the whole brew, but finding E. coli? Starting with E. coli laced compost? Are these people trying to sabotage the concept of aerobic compost tea? I'd say so, wouldn't you?

Like saying that unleavened bread is the same as raised bread. All the same ingredients. But "brewing" time. A critically important factor neglected, and the two things are very different. If you neglect maintaining aerobic conditions in compost tea, you won't have aerobic tea. But you also have to use COMPOST with the biology that is in good compost.

In compost tea that works to suppress and protect against disease, the builds soil structure, reduces water use, etc, the biology is what is important. Maintaining aerobic conditions can be very important in getting the right biology. But there may be other ways to achieve the same endpoint.

So, in these papers, at least they are doing things right. They still need to fully grasp that it is the biology that is important. There may be several ways to achieve good biology – but if doing some other method of achieving good biology, those methods need to be documented. How about an “Anaerobic Compost Tea Brewing: What works, and what doesn’t”?

Anyway, here are two of the references:

1. Al-Dahmani, J.H., Abbasi, P.A., Miller, S.A. and Hoitink, H.A.J. 2003. Suppression of bacterial spot of tomato with foliar sprays of compost extracts under greenhouse and field conditions. PLANT DISEASE. 87 (8): 913 – 919.
The efficacy of foliar sprays with compost water extracts (compost extracts) in reducing the severity of bacterial spot of tomato caused by Xanthomonas vesicatoria was investigated. Extracts prepared from composted cow manure, composted pine bark, an organic farm compost, or composted yard waste, applied as foliar sprays on tomato transplants, resulted in a moderate but statistically significant reduction in the severity of bacterial spot. The population of *X. vesicatoria* in infected leaves was reduced significantly by extracts prepared from composted cow manure. Efficacy of the water extracts was not affected by oxygen concentrations in the suspension during extraction, compost maturity, or sterilization by filtration or autoclaving. The degree of control provided by foliar sprays with the most effective compost extracts did not differ from that obtained with the plant activator acibenzolar-S-methyl. In the field in two growing seasons, foliar sprays with compost water extracts did not reduce the severity of foliar diseases, including bacterial spot. During the 1997 season, when the severity of bacterial spot in the field was high, <u>foliar sprays with compost water extracts significantly reduced the incidence of bacterial spot on tomato fruit</u>. Amending plot soil with several rates of composted yard waste did not lead to additional control of fruit disease over those only sprayed with extracts. Foliar sprays with a mixture of chlorothalonil and copper hydroxide or with acibenzolar-S-methyl reduced the severity of bacterial spot as well as incidence of spot on fruit.

Just keep in mind, all these brews were aerobic, so oxygen concentration wasn’t important.

2. Utkhede, R and Koch, C. 2004. Biological treatments to control bacterial canker of greenhouse tomatoes. BIOCONTROL. 49 (3): 305 – 313.
Experiments were conducted to determine the effects of treatments on *Clavibacter michiganensis subsp. michiganensis* in vitro and on young seedlings inoculated with the pathogen under greenhouse conditions. Lysozyme was bactericidal at 10 g/l concentration in vitro. Tomato plants treated with lysozyme at 10 g/l and 100 g/l showed significantly higher plant height compared with the inoculated control plants, and plants in these treatments were as tall as those observed in untreated uninoculated control plants. Treatments with *B. subtilis* (Quadra 136) and *Trichoderma harzianum* (RootShield(R)),

lysozyme, vermin-compost tea, *Rhodosporidium diobovatum* (S33), *B. subtilis* (Quadra 137) applied as a spray at 0.3 g/l, 0.6 g/l, 10 g/l, concentrated, 1 x 10(9) CFU/ml, and 0.5 g/l, respectively, have the ability to prevent the incidence of bacterial canker of tomato plants caused by *C. michiganensis subsp. michiganensis* under greenhouse conditions.

I added the underlines, so you could find the compost tea references.