

September 2005 E-Zine

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Notes from Elaine!

SFI Lab Directors Meeting held.

SFI Lab directors from all over the world gathered in Kananaskis, Alberta, Canada the end of August. Ted Leischner, director of the SFI Canada lab, hosted the event, and combined this visit with the official opening of his lab. The opening ceremonies were well-attended by the local Canadian press as well as national representatives of TV and news agencies. We hope that Ted has set his efforts on a long and profitable venture! For press coverage please email Ted and get his info from him – info@soilfoodweb.ca

In the lab meeting, the finished version of the computer database was given to all the directors. Those directors not attending the meeting will be sent their new database programs via mail. Directions for installing the database are on the CD.

The England lab is just about ready to start taking samples. Please contact Graham Kinsey, graham@laverstokepark.co.uk The lab in the UK will be housed at a research farm run by Jody Scheckter.

Price Reductions

SFI Corvallis has recently dropped their prices for the total Foodweb package. Other labs can drop prices as well, if they see fit to do so.

Actinobacteria enumeration

Given that most clients do not understand the hyphal diameter significance, we will now start to split the actinobacteria from true fungi on the report. The Fungal Biomass data will include strictly true fungi, while actinobacteria, if present will be reported as a separate item below the table of

data. Therefore, diameter of the true fungi will reflect the true fungi, and not have to be interpreted to understand if a mix of fungi and actinobacteria are present.

Qualitative assays can't give total protozoa numbers

Qualitative reports reflect ACTIVE protozoa only. Anything less than 1,000,000 active protozoa per gram probably cannot be detected using the qualitative approach. If total protozoan numbers are needed, the quantitative assessment must be performed.

SFI Oregon Lab Established

The parent company, SFI, has separated the lab function from the parent company. All SFI labs are run by independent owners/operators, with Dr. Ingham remaining responsible for quality control. Quality standards are maintained by constant checking and comparison of standard samples. Dr. Ingham remains in control of this function, but otherwise, labs operate within their own spatial areas. The New York lab, for example, is responsible for taking samples from, and interacting with people about sample results, from the Mississippi east, while the Oregon lab works with people from the Mississippi west. The Australia lab, in Lismore, New South Wales, is responsible for all of Australia, and so forth. The change from the past is that Dr. Ingham has been freed to do more research and development rather than oversee the day-to-day operations of the Oregon lab.

1. Observations from Tea users

a. Mistletoe Observations

We were spraying a batch of ACT the other day, and the top of the spray hit some low-hanging branches of a mesquite tree. This poor tree has been infested with mistletoe for several years (I periodically make a half-hearted attempt to prune it out, with no real success).

The next morning, the mistletoe on the lowest branch was brown and was easily pulled right off.

I am planning to do another brew and spray the whole tree to see the results. In the meantime -- any ideas about *how* ACT might work to kill mistletoe?

Judith McGeary, Texas

b. N from Compost Tea

In a message from the compost tea list serve, I was asked about the amount of N from aerated compost tea, using the following example:

15 lbs compost added to 500 Gal brewer = 6818 grams compost x 0.25 gram N/gram compost = 1704 grams N TOTAL in 15 lbs compost.

Our 'traditional' soil sample report calls for 30 lbs N / acre which would be 13,636 grams of inorganic N PER ACRE! Therefore, it seems like the 1704 grams of 'organic' nitrogen is insignificant for a 50 acre field.

What about K and Phos? We will be planting some fields in clover this fall. Our 'traditional' soil test calls for addition of K and Phos for clover (5 lbs P₂O₅/ac & 85 lbs K₂O/ac). Should this be applied in these amounts WITH the ACT or is it not needed if we will be using ACT at 20 gallons / AC? Where can I go to learn more about 'transitioning' from traditional to organic methods???

Elaine's response:

Consider that the reason you have to put 30 pounds of N per acre in a conventional system is because you know that you will lose 80% of that due to leaching losses to groundwater.

You actually only need 20% of that input, most likely.

Consider that in compost tea, you often add fish hydrolysate, kelp, and/or humic acid, all of which contribute a significant amount of N, greater than you calculated.

And consider that you don't put down one application of compost tea in a season. Each application will add N.

With respect to nutrient cycling, that is based on the N release from the bacteria and fungi grazed by the protozoa and nematodes in the soil. In a three month period of time, the interactions between organisms will release that much inorganic N. This assumes you do not kill the critters with use of toxic chemicals.

With respect to K and P, consider that again, the fertilizer recommendations have to take into account the losses resulting from leaching. With the biology in the soil, we won't have those losses.

We THINK, based on the observations that we've made, that we can reduce K or P inputs into the soil by 1/60th of the recommended rates you get on a soil chemistry report.

Let me say that another way, just what I just said is perfectly clear.

Your soil chemistry report comes back, and it has a recommendation of 500 pounds of a potassium fertilizer to be added by in. There is no way that your crop needs 500 pounds of K fertilizer. But those rates were determined by adding fertilizer to the soil, and seeing what amount of fertilizer was required to get a plant response.

But if you take into account that 80% of that fertilizer will be lost as a result of leaching, then those high rates become more understandable.

If we add the proper biology back into the soil, those leaching losses will no longer occur.

Thus, addition of the fertilizer to the compost pile, where the biology is growing rapidly, will result in all the K, or P, or N, being tied up in the biology, an organic matter, not lost as a result of leaching or volatilization.

If we have excellent nutrient cycling going on in the compost pile, then when we add those not-leachable nutrients, they will cycle into plant available forms, hopefully in the root system, where they will feed the plant.

Only the nutrients removed in whatever is harvested and removed from the field have to be returned from that point on. Calculate the amount of K (or N, or P) removed in your crop - but DO NOT include the residues left on the soil surface. The nutrients in that residue will be cycled back into plant available nutrients by the biology, if you have the biology.

Example: Let's use some easy to divide numbers here.

A single plant requires a certain amount of nutrient. Imagine a corn plant weighing 10,000 g. Water is about 90% of that weight, so the corn plant is 1000 g dry weight. Of that dry weight, 50% is carbon, or 500 g of C. Most plant material is C:N of 30:1, so a 1 kg plant contains about 150 grams of N.

The plant has to be able to obtain that 150 g of N from the soil around the root systems. If your roots are restricted to the top 4 to 6 inches of soil, that would mean that the plant needs to have 15 micrograms N per gram (ppm) of that soil, so the root system would be able to take up enough N to supply plant growth.

Look at your soil. Sum the amount of nitrate, ammonium, protein, microbes, etc. Does your soil have enough?

What if your roots go deeper? What if the soil has better structure and the roots go 1 foot (12 inches), then there only needs to be 7.5 ppm N in that amount of soil. What if the roots of your corn plant goes 3 feet? 5 feet?

How much N is there in soil that your biology can access to make available to the plant. I'm not talking soluble N, or even just exchangeable N. I'm talking TOTAL N.

Take a basic ag soil, with about 0.5% organic matter in that soil. There is some 8,000 to 9,000 ppm total N in soil, which CAN become available to your plant, if you have the right biology functioning.

Your plant needs 15 ppm, even if restricted by a plow layer, and there's 8,000 ppm in that soil?

Why do you need add any nitrogen to that soil?

Ah! Because in ag soil treated with a conventional program, the biology to convert the nutrients in that soil into plant available forms is lacking.

It is not the nutrients that are lacking.

It is the biology that is lacking.

In addition, the habitat to allow the biology to function is not present.

So, what needs fixing?

How ridiculous is it to add more N to an already N rich soil?

How ridiculous is it to add the proper biology to a soil completely lacking in the proper biology?

If plants show nutrient deficiency, it is the conversion of the nutrients already in that soil into plant available forms that is the problem.

One last point - we are just figuring a lot of this out. There is a lot of room for discussion, and I'm presenting this as discussion. The current chemical paradigm doesn't make sense to me, when you start realizing that we have destroyed the life in our soils.

And it is life that turns not-plant-available nutrients into plant-available nutrients.

For those who want to understand more about this, delve deeper into this whole shift in mind-set, please get signed up with Joe Whaley, at the Sustainable Studies Institute, on a program of Regenerative Agriculture.

We work with you to put you on this conversion to build your soil.

We can build 2 to 5 inches of soil a year. More if you really want to put some money into the process.

The program costs \$500 a year, per field, for the initial annual program and the annual biological testing required.

For less money than you would have spent on the toxic chemicals, you establish the biology needed to build soil, nutrient cycling, reduce water use, etc. The transition period is minimal if you do the program. In a year, and often less than a year, the soil can be regenerated.

And we are calling this Regenerative Agriculture, a term I am officially annexing.

We came up with and are using this term to describe what we are doing, from our work with Regensis Farm in Byron Bay, Australia, to the work in Battery Park City with T. Fleischer, to the work with James Sottilo with TreeWise on Long Island in landscaping, to the work with Hendrikus Schraven in Seattle also in landscape design, to the efforts with Harry MacCromick at Sunbow Farm in Oregon, and Steve Bridges with TOFGA, in Texas, and many, many others.

The compost, compost tea or biological inoculum and food/nutrient packages that are part of the program we will recommend are in addition to the \$500 for our program. The \$500 includes the soil biology testing that is needed. But in every case of working with a client who was on a conventional ag program, the cost of the biological program has been less than the toxic chemical approach, and benefits other than just saving money also occurred. Such as, increased yield, and/or improved quality of the produce, reduced water use, fewer weeds, reduced or no disease, increased root depth, more roots.....and on and on.

So, call Joe if you are interested in starting a program!
541-752-5066 ext 106

Elaine Ingham

c. Insects and Gardens

Eric Grissell gave a talk for the Library of Congress on July 27, 2005.
We have a Web cast of the talk- thought this might be of interest to SANET
http://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=3729

Insects and Gardens: In Pursuit of a Garden Ecology
Eric Grissell, entomologist with the U.S. Department of Agriculture, gave a lecture and slide show on his book, "Insects and Gardens: In Pursuit of a Garden Ecology." Grissell suggests it might be time to declare a truce with insects in the garden. He explains the vital role insects play in every garden ecosystem and writes about the various orders of insects, describing how the insects grow, feed and reproduce.

Enjoy!

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d. Green-up of grasses

From: [James Toler](#)

Sent: Friday, August 19, 2005 9:20 AM

I'm looking for a product that will give a quick green-up on turf. Ferrous-sulfate will do it and is approved for organics but might be a bit hard on the fungi and we have two compost tea treatments down on this site. Anyone used molasses for this treatment? Or anything else?

Jim Toler
Willamette Organics
www.willametteorganics.com

Jim,

If the two teas you have applied were bacterial dominated then you will need to brew and apply a protozoan tea to release the nitrogen tied up by the bacteria. If you then apply the molasses to maintain the bacteria the greens should stay green. If you apply the molasses and no protozoa the green will go yellower.

I have also seen some of my veggie crops go yellow after several Tea applications then applied a good protozoan tea and they change colour in 3 - 5 days the same as the golf greens do for me.

Regards

Shane Gishford
ICCS
Queensland, Australia

e. Increased yields typical of getting the biology right

We have found that in organic wheat, barley or oats, that the production usually goes up if the system has been conventional long enough and the residual fertilizers are available in the soils. The trick is to turn it around after that has been released and to continually release other minerals in the soil to sustain a crop. For example, we had a farmer who came to us and said he was turning up old fertilizer with the plow from 2-3 years before. Or a farmer who could visually identify three years ago grass in an alfalfa field. It is important to note that without the high yielding conventional (low nutrient value) crops, the supply would be lower and the value up. Good call Bob.

Ray Gore

Upcoming Events

Workshops

SFI Corvallis

Dr. Elaine Ingham teaches three in-depth workshops at the Soil Foodweb, Inc. Laboratory in Corvallis, Oregon. The workshops include classroom instruction, hands-on laboratory work and field demonstrations.

October 15—17, 2005

Introduction to the Soil Food Web

http://www.soilfoodweb.com/04_news/calendar.htm

October 19—20, 2005

Compost Technology

http://www.soilfoodweb.com/04_news/calendar.htm

October 20—21, 2005

Compost Tea Technology

http://www.soilfoodweb.com/04_news/calendar.htm

In-depth descriptions of the three workshops are available as a PDF download.

http://www.soilfoodweb.com/04_news/pdfs/05_SSI_Workshops.pdf

For more information call (541) 752-5066 or email info@soilfoodweb.com

Microscope class – October 22, 2005 Register now to secure your place!

Light Microscope Class - SFI Corvallis

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 20) 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.

Two scopes have been recommended by Dr. Ingham. Alexis J-model \$425.00 or Leica CME-\$1400.00 (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 call (541) 752-5066, or email info@soilfoodweb.com.

Start thinking about ACRES this December – Dr. Elaine will be presenting a seminar on soil microbiology, with an expert using EM inoculum to modify the soil. These presentations will go hand-in-hand, as Dr. Elaine explains what bacteria, fungi, protozoa, nematodes and microarthropods do in soil to retain nutrients, suppress diseases, build soil structure and reduce water use. How are these processes altered or enhanced by EM? What specific functions does EM do? A microscope course will be offered as well, but participants must bring their own microscopes, or purchase microscopes that will be made available at the course.