

September 2006 E-zine

I want to make certain that anyone doing a program gets a site visit by either Joe Whaley or me. It is amazing what problems can be avoided with just a few minutes of having one of us come out and see what you are doing. Let us check out your compost, or where you are getting compost from. What tea brewer is being used, conditions of brewing, spraying, etc. Simple improvements usually can be made that will make a huge difference. If Joe and I can't be brought out, please make certain that your advisor is talking weekly with Joe Whaley or with me.

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1. Up-coming Meetings and Events

1.a. Holiday closures

Soil Foodweb Inc. and the offices in Oregon will close to observe legal holidays on Thursday and Friday 23-24 November 2006 (Thanksgiving weekend), Monday 25 December 2006 (Christmas), and Monday 1 January 2007 (New Year).

1.b. Soil Foodweb advisors teaching at NOFA Course in Organic Land Care

Certified Soil Foodweb Advisors Todd Harrington and Chuck Sherzi, Jr. will be teaching at the 6th Annual NOFA Course in Organic Land Care:

<http://www.organiclandcare.net/events/6thannual5day.php#course>

Soil Foodweb concepts will be covered in the organic lawn section on January 9-10 in Leominster, Massachusetts and January 31 and February 1 in New Haven, Connecticut.

1.c. Chuck Sherzi teaching at Arnold Arboretum of Harvard University

Landscape Institute - Harvard University

Ground Rules: Soils and the Sustainable Environment - Sherzi, Jr., Chuck

This course will emphasize the importance of soil and of the ecological systems and cycles that are vital to the health of the planted landscape and the urban forest. Soil

testing methods, analysis and interpretation of results, and corrective action strategies are thoroughly discussed. It is essential to understand the soil chemistry and the biological activity in the soil in order to develop a sustainable blueprint for any landscape. . . .

January 22-April 30, 5:30pm-8:30pm; for more information:

<http://www.arboretum.harvard.edu/programs/ld/courses.php?sa=&sem=Spring%5E2007>

[Chuck] will also be doing a compost workshop through the Arnold Arboretum adult education program in April 2007. Details to follow.

1.d. Sustainable Studies Workshops Feb 5-10

February 5-10: Core Workshops and Microscope Class in Corvallis, Oregon

For some reason we had wrong dates in previous announcements of these workshops. February 5-10 have been confirmed as the correct dates. Registration forms are here:

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

2. Notes from Elaine!

2.a. Call for potential volunteers

I have been spending time in Australia, South Africa and California working on demonstration sites documenting HOW TO enable the Soil Foodweb approach.

Improving biology requires an understanding of what has been done to the land, what “problems” you have. Do not let anyone delude you; chemical toxics are MASKING problems! You most certainly have a problem if you are using chemical methods to control those problems. We need to know what equipment you have. We may be able to adapt some equipment without you having to buy anything new. We then want to figure the easiest way to get the biology improved and established.

Demonstration sites give local people an understanding of EXACTLY how to make this work, in their conditions, with their plants. SFI cannot pay to have these demonstration sites started, maintained or used as educational sites. We work WITH you, of course, and continue to work with the site as it becomes the regional SFI approach educational site.

We are looking for people who want to invest in this type of educational approach. We are talking about a fair amount of money needed to invest in the training of people on-site, the equipment to do composting, aerated compost tea machines, seminar rooms for training, and advertising the training program to local growers.

If interested, please e-mail me, or Joe Whaley, and we’ll start the discussion relative to what is needed.

2.b. More news on the water front.

Good news just received from Earth Fortification! An easy way to deal with water problems has been found! Working with water chemistry people, Earth Fortification has developed what looks like a way to easily deal with this problem.

Matt Slaughter, of Earth Fortification, asks that you send him a water quality chemistry report along with a soil Foodweb report of the soil, so he can formulate, with help from experts of course, the right set of foods to add into your tea to fix both water quality problems as well as feed the organisms you need in your soil.

So, to summarize:

1. Water chemistry analysis
2. Soil Foodweb analysis
3. Soil chemistry analysis
4. what plants you want to grow

Matt will send the “package” of foods needed to make good tea and start getting the biology in the tea activated to make super ACT. Of course, the first couple times you do this, we need a soil Foodweb analysis two weeks later to make sure the biology got established. Once your plants are growing in a healthy fashion, we no longer need to do intensive assessment like this, but the first couple applications, it is needed.

2.c. Making compost

Working with folks all over the world, I’m collecting more ways of doing compost. Which means the book is going to be a bit longer before it comes out.

I want to include temperature data on different piles with different starting material builds in the book. I’d appreciate the information on your starting material mix, size of pile. Methods of turning, water addition, AND temperatures measured on a daily basis through the life of the pile.

That’s a lot of data. But if you have it, it would be useful to get that experience into the book.

Some recent conclusions when making compost (which I’m sure many people know, but many people don’t, so I’m making sure the general information goes out).

1. No more than 5% of the final set of starting materials should be “chunky”.
 - a. If more than 5% is chunky, you need to break that up before starting to compost
 - b. If less than 5% chunky, be aware that the “high range” for turning is really more like 155 F, or 60 C. No chunks means hard for oxygen to get into the pile, so you have to turn more.

- c. If the chunks don't get decomposed during the composting cycle, you don't have the right kinds of really beneficial fungi in the pile
 2. If the temperature of the pile stops climbing to 160 F, or 65 C, you have to check the following:
 - a. Moisture. When you remove a handful of material from anywhere in the pile, you should be able to just barely squeeze a drop of moisture out of it. Too wet and the compost will go anaerobic. Too dry and the microbes can't do their job of decomposing the material.
 - b. Adding water is critical during the composting cycle (unless you are composting in the rainy season using cardboard, or wettable cover material). Add moisture to the pile **AS IT IS BEING TURNED**. If moisture is needed beyond that, consider covering the pile, or injecting moisture into the pile.
 - c. Check the pile often when you are first working out a new recipe using unfamiliar starting materials
 - d. Adequate high N. High N is not the same as green. High N containing materials **DO NOT COUNT** as green. You need **BOTH!** Any pile should be assessed for high N, green, and woody. If you have put something in the high N category, it cannot also be included in the green component.
 - e. Toxic chemicals. Add additional **SOLUBLE** sugars (or green materials) **AND** microbial inocula to deal with pesticides if you think you have added materials that might have been treated with some herbicides or pesticides. Any green waste material coming from municipal sources should be assumed to be contaminated.
 3. Water quality is critical. Check EC, chloramines and pH. If these are too low or too high, you need to add materials to fix the problems. If you have problems, please work with Matt Slaughter (matt@earthfort.com) to get your water problems dealt with.
 4. Remember that fresh vegetable material contains an amazing amount of moisture. As it breaks down, sappy wet (potentially anaerobic) conditions can develop as the organisms decompose the vegetable material. Break up the vegetables to release internal moisture immediately, or plan on adding dry carbon (paper, cardboard, sawdust, wood chips) at the time the vegetable material breaks down. This may mean turning an extra time.

As I learn more, and remember additional points, I'll try to remember to add them here.

2.d. The on-going E. coli "thing"

This is a series of comments from SANET, which is a really interesting place to touch on the politics of organics and sustainable agriculture.

I think this on-going discussion is useful to help all of you understand the insanity that is going on. Please remember that the latest reply is first on the list, and you go back in time as you go down.

And please note, the evidence I have seen suggests that it is the water source, not the way the spinach was grown, where the virulent strain got into the food supply.

Elaine

Sept 29, 2006

Hi Jane,

To quote the editor of the British Food Journal "A common misconception is that science and research are about facts" Griffith, A. Editors's note British Food Journal 2006,108,8

Avery has, I believe, little or no professional qualification in genetics and microbiology. At that same time he is the tip of a mountain that openly state that new technologies need to be nurtured and to do that the researcher's prime directive "experiments must be reported fully and truthfully" can be ignored. Professor Griffith states the philosophy very clearly that experiments should be reported to fill the needs for nurturing of new technologies such as biotechnology. Unfortunately that is a new viewpoint that has begun to pervade research in genetics and biotechnology.

Sincerely, joe cummins

Sept 28, 2006

Jane Grimsbo Jewett wrote:

Greetings, all;

Mr. Avery has misinterpreted the results of the University of Minnesota study. (I'm sure you are all very surprised ;0)) (SEE AVERY'S COMMENTS APPENDED TO JANE'S COMMENT BELOW)

A PDF (718 kb) version of a PowerPoint presentation on these research results, and a link to the abstract of the journal article, are available on the MISA website:

http://www.misa.umn.edu/Faculty_Papers.html

The citation for the article:

Avik Mukherjee, Dorinda Speh, Elizabeth Dyck, and Francisco Diez-Gonzalez. Preharvest Evaluation of Coliforms, Escherichia coli, Salmonella, and Escherichia coli 0157:H7 in Organic and Conventional Produce Grown by Minnesota Farmers. Journal of Food Protection: Vol. 67, No. 5, pp. 894-900.

Actually, the U of Minnesota results provided some evidence that National Organic Program rules for manure and compost handling and application do succeed in reducing pathogen levels on vegetables. The researchers recruited organic and conventional vegetable growers in Minnesota for this study. They allowed growers to self-identify as not certified organic but using organic practices. They actually analyzed three groups: conventional growers, growers who self-identified as organic but were not certified, and certified organic growers. They found no significant differences in pathogen levels between conventional and certified organic growers. Among the growers claiming organic practices, they found that those who used manure or compost aged less than 12 months had vegetables with pathogen levels 19 times higher, on average, than those who used a longer aging process.

Other noteworthy details:

* One non-certified farm was an outlier with an extremely high percentage (92%) of all vegetables testing positive for E.coli. This outlier was included in the "organic" totals.

* Overall average coliform count was the same in the organic (certified + non-certified) and conventional produce.

* There were 117 produce samples from certified organic farms, 359 produce samples from non-certified farms, and 129 produce samples from conventional farms. Total produce samples for the study: $117+359+129 = 605$. E. coli was found on 8% of the total samples, or 48 samples out of 605.

* E. coli prevalence was reported as percentage of positive samples for a variety of types of vegetables (table 3 of the full article); but sample sizes were very small, which tended to make percentages look large when there were isolated cases of contamination. For example, zucchini: one sample out of a total of four samples from certified organic farms tested positive for E. coli; which is 25% prevalence.

* E. coli prevalence on lettuce was zero for certified organic farms (zero out of 10 samples), 16.7% for conventional farms (one out of six samples), and 30.8% for non-certified farms (12 out of 39 samples). Prevalence for "total organic" was then reported as 22.4% (12 out of 49 samples).

* Similarly, E.coli prevalence on leafy greens was zero for certified organic farms (zero out of 19 samples), 25% for conventional farms (one out of four samples), and 13.8% for non-certified farms (9 out of 65 samples). Prevalence for "total organic" was reported as 10.7% (9 out of 84 samples).

No E. coli 0157:H7 and no Shiga-toxin were found on any produce samples.

It is unfortunate that the authors did not make a clearer distinction between certified organic and non-certified growers in the abstract of the article. That distinction is made more clearly in the full article, but still not completely. The distinction is not made in the PowerPoint.

This was a good and useful study, but it has nuances that simply are not captured in the abstract. Careful reading of the full article is necessary in order to be able to make accurate comments on it.

Okay-- so if you want to read the full article, it's accessible online, but the access is a little bit complicated. I apologize in advance for trouble anyone may have. Here's how I was able to find it:

1. Go to the U of MN library: www.lib.umn.edu.
2. Under the bar that says "Welcome," click on E-journals.
3. In the Title search box, type "journal food protection." Click the Search button.
4. Click on the found title, "Journal of food protection." This should open a new browser window.
5. Enter the Year: 2004, Volume: 67, Issue: 5, and Start Page: 894. Click "Go." This opens another new browser window. Click "yes" to enable a secure connection.
6. This pulls up an IngentaConnect page with the abstract. Scroll down the page to find "Article Access Options."
7. It should say that you have access to the full text article. Where it says "View Now:" click on the box that says PDF. This will download the article.

Regards,
Jane Grimsbo Jewett

Here's what the World's Greatest (Paid) Authority on all things organic has to say about all this:

WEBCommentary Contributor
Author: Dennis T. Avery

Bio: <<http://www.webcommentary.com/asp/bio.asp?authid=averyd>>Dennis T. Avery
Date: September 27, 2006

Tainted Spinach Raises Questions of Manure on Food Crops

Ten years after one of the country's top food safety experts (WHO WOULD THAT BE? HE'S REFERENCING HIMSELF< OF COURSE - ERI) warned of danger from putting manure on food crops, Americans are still being devastated by manure-born pathogens. It doesn't have to be.

Contaminated raw spinach has just killed at least one person, brought devastating kidney failure to 23, hospitalized more than 75, and sickened more than 150 people across America. The deadly spinach has been traced back to Natural Selections Foods, the largest grower of organic lettuce and spinach in the United States.

Organic rules bar the use of manufactured fertilizer on their crops, so organics use composted manure and other animal wastes on their fields. Animal manure is the ultimate source of the virulent E. coli O157:H7, which contaminated the spinach.

In 1995, the Journal of the American Medical Association quoted Dr. Robert Tauxe, head of foodborne illnesses for the U.S. Centers for Disease Control, telling a medical conference that "Organic means a food is grown in animal manure. . . . We got rid of human waste in our food and water, and I think we're going to have better control in the future of manure in our food and water."

The Organic Trade Association responded that organic food was safe because farmers compost their manure. Dr. Tauxe responded that "Unfortunately, knowledge of the critical times and temperatures needed to make composted animal manures microbiologically safe is incomplete."

Today, USDA organic rules allow manure to be applied after just 3 days of composting (NOT TRUE - ERI)—right up to harvest time! Raw manure can be applied until 90 to 120 days prior to harvest, under most state-level rules for all farms (NOTE THAT IS ALL FARMS). But a recent University of Minnesota study found that produce grown with manure aged 6 to 12 months was still 19 times more likely to be contaminated with E. coli than foods grown with manure aged more than a year. (READ COMMENTARY BELOW ABOUT THE CONDITIONS OF THAT STUDY – IT WAS CLEARLY A TOTALLY BOGUS STUDY - ERI)

Virtually no farmers age their manure for a year as too much of the vital nitrogen gasses off into the air during that time. Instead, most conventional farmers put their manure only on feed crops such as corn or on pasture. That may be why the Minnesota researchers found organic produce three times more likely to be contaminated with E. coli (7% of samples) than conventional (2%). (THAT WAS WITHIN THE STATISTICAL VARIANCE IN THAT STUDY AND NOTE THE CONDITIONS OF THAT STUDY IN THE FOLLOWING COMMENTARY)

Organic activists love to claim that the deadly O157:H7 strain of E. coli is caused by factory farming. Not so. The USDA says it has found O157:H7 in every cattle herd it's tested for it. A Swiss study last year found no significant differences in O157:H7 prevalence between organic and conventional dairy farms. Claims that grain feeding of cattle causes O157:H7 to flourish are also unsupported; various studies have found the opposite. (OOPS, HE MESSED UP ON SCIENTIFIC FACT THERE!)

Washing the food can't fully protect consumers either. Rutgers University has shown that lettuce (and likely spinach) can take up O157:H7 via its roots and harbor the pathogens inside the leaves! (ONLY IF YOU GROW THE VEGETABLE IN SUCH BIZARRE CONDITIONS AS TO BE COMPLETELY RIDICULOUS). In short, there is no practical way to ensure full safety in the food crops fertilized with manure, composted or not.

Is it time to get the manure out of human food crops? (IF DENNIS COULD ONLY FIGURE OUT THE DIFFERENCE BETWEEN MANURE AND COMPOST! ERI)

States could require that manure either be used on non-food crops or composted for at least a year. Annual questionnaires could identify the relatively few farms that compost with regular government inspections made.

This will raise howls of protest from the organic movement, which also protested the current weak manure rules. However, it's now clear that using manure on food crops involves a serious public risk—especially with leafy produce like lettuce and spinach. The organic movement should want to ensure its customers health as urgently as do public health officials.

Eating no longer needs to be a deadly game of Russian roulette.

Dennis T. Avery Director, <<http://www.cgfi.org/>>Global Food Issues

Biography - Dennis T. Avery

Dennis T. Avery is a senior fellow for Hudson Institute in Washington, DC and the Director for Global Food Issues. He was formerly a senior analyst for the Department of State. Readers may write him at Post Office Box 202, Churchville, VA 24421.

Read <<http://www.webcommentary.com/asp/ShowAuthor.asp?id=averyd>>other commentaries by Dennis T. Avery.

Visit Dennis T. Avery's website at <<http://www.cgfi.org/>><http://www.cgfi.org>

Date: Thu, 28 Sep 2006 22:53:57 -0400

From: jcummins <<<mailto:jcummins@UWO.CA>>jcummins@UWO.CA

Subject: E coli 0157 and composting to prevent crop and water pollution

Douglas Hinds recently asked about references and evidence that composting kills E coli 0157, I prepared the article below to provide those papers. September 28, 2006

Prof. Joe Cummins

Escherichia coli (E. coli) 0157 composting to prevent crop and water pollution

The recent out break of food poisoning from consuming fresh spinach contaminated with Escherichia coli (E coli) 0157 caused at least 183 people to be made ill, of these 29 suffered kidney damage of a type called hemolytic-uremic syndrome (HUS). People most seriously infected included mainly the very young and older people, at least one person has died from the infection (1, 2). There has been a great deal of discussion about the source of the infecting bacteria on the spinach. The pathogen pollution could have been caused by the use of contaminated manure, leakage of bacteria from cattle into surface water runoff into the irrigation system or infected people harvesting or packing the spinach. People have questioned whether or not produce from organic farms has spread the polluting pathogen. However, organic standards for certification preclude use of fresh manure on organic produce. Only composed manure may be used in organic produce production. Does composting destroy E coli 0157?

E coli 0157 is mainly spread by cattle through their manure, while some other food animals may spread the pathogen cattle seem to be the main source. Cattle do not suffer from E coli 0157 infection while humans do. Humans have cell surface receptors that allow attachment of E coli 0157 and transfer of its toxin (viro toxin - shiga toxin) to the cells of the urinary and digestive system while cattle do not (3). Pigs are more like humans than they are like cattle in this regard.

Composting manure is effective in destroying E coli as long as temperatures above 50 degrees C are achieved, temperatures elevated but below 50 degrees C cause an initial decline in the pathogen but this is followed by a significant re-growth of the pathogen at the lower temperature The pathogen was destroyed after 300 degree/days (say 6 days at 50 degrees C of heating).(4).

A study from Sweden showed that E. coli 0157 could survive for as much as a year in manure treated soil and in manure that had not been composted. Different strains of E coli 0157 differed in environmental survival. Urea treatment of cattle manure minimized transfer of E coli from animal to animal and hence to humans (5). The gene for shiga toxin of E. coli 0157 can be transferred to relatives of E coli 0157 and even to other bacterial genera, such as Citrobacter. Parsley infected with shiga toxin bearing Citrobacter bearing the shiga toxin gene from E coli caused a major outbreak among people consuming parsley butter. The gene is transferred among bacterial genera by a bacteria phage (bacterial virus) Stx2 by a process called viral transduction.. Growth of the phage was supported on compost, but the phage can be eliminated by composting 40 days during which a temperature greater than 50degrees C is maintained for at least 5 days (6). Compost teas can support re-growth of E, coli 0157 if molasses is added to the tea but teas with traces or no molasses do not support growth of the pathogen (7).

In a peculiar experiment chicken manure compost, dairy manure compost and irrigation water were inoculated with E coli 0157 from which the shiga toxin gene had been deleted to prevent infection. The researchers concluded that pre-harvest contamination of carrots or onions can occur for several months through both contaminated manure compost and irrigation water (8) The report failed to mention that correctly prepared animal manure compost is free from E coli 0157 unless, of course it has been inoculated by scientists from the USDA who co-authored the study! Contaminated irrigation water was found to transport pathogenic bacteria to the soil where they persists for a long period of time and contaminate the vegetables growing in the fields irrigated by this contaminated water (9).

The tiny soil round worm *Caenorhabditis elegans* was found to transport E. coli 0157 through the soil and that way to spread the pathogen in soil (10). *Caenorhabditis elegans* (*C. elegans*) is a roundworm (nematode), about 1 mm in length. The worms are not parasites. They live in soil and feed on bacteria. *C. elegans* is well-known as a model laboratory organism to study animal development.

Polyacrylamide (PAM) is used very extensively in the irrigation water in western USA . The use of the degradable plastic prevents erosion and it does so at a reasonable cost to the farmer. PAM treated irrigation water has been found to remove microorganisms from the surface water (11). The use of the plastic in Salinas Valley of California, from which the current E coli 0157 outbreak originated, might have prevented spread of the pathogen from irrigation water.

In May 2000 the water supply of Walkerton, Ontario (near the south shore of Lake Huron) was contaminated with E coli 0157. Eleven fatalities were attributed to the pollution. The deaths occurred mainly in the elderly, but also included a 30 year old man and a 2 year old child. More than 2,000 people are believed to have been ill, with over 400 attending the emergency department of the local hospital with severe gastroenteritis symptoms. Many of the children with HUS syndrome were in critical condition and were transported to London, Ontario for the care of specialists. The Victoria Hospital emergency helicopter pad is near my home and the many flights with suffering children were a nightmare burned into my memory. Many of those injured children will require kidney transplants as they mature. A forensic investigation of the pollution showed that the pathogen could be traced to one municipal well near a beef cattle operation from which the pathogen contaminated the pipes of the entire city (12). The city water plant operators were not qualified, their appointments were political rather than professional and they were careless. They were charged and convicted of neglect.

In conclusion, there have been some who try to implicate organic farming in the recent outbreak of E coli O157 infection in spinach. However, it is very clear that certified organic production requires composted manure which science shows is free of E coli O157. Conventional farmers may use raw manure. However, a single dairy farm or cattle operation near an open irrigation system could have leaked polluted water into the irrigation water of the Salinas valley. A forensic investigation is, I believe, being undertaken to locate the source of the pathogen but it would be surprising to find any association whatsoever with organic agriculture. There is a further complication, to quote the editor of the British Food Journal, "common misconception is that science and research are about facts." (13) That point of view is, unfortunately, pervading much of the views of organic agriculture expressed by its opponents who promote biotechnology.

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