October 2006 SFI E-zine

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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 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

1.e. Ecological Landscaping Association Conference, Mar 1-3

The ELA announces a new event for their 13th annual Winter Conference:

March 1, 2007
Full Day Pre-Conference

DR. ELAINE INGHAM, Soil Foodweb
"Creating Healthy Soil Systems"

Thursday Night Dinner Keynote: DR. INGHAM.

Information on how to register can be found soon at:
http://www.ecolandscaping.org/

2. Notes from Elaine!

2.a. Incredible Tea!

I want everyone to go look at the compost tea results Matt Slaughter is getting. They are truly amazing!

Matt has been carefully working to get a consistent, quality compost.

Matt then took a hard look at the water he was using, and working with Jennifer Appel, came up with specific vitamins to deal with the problems in the water here. It took Jennifer about a month to come up with the blend of vitamins for his specific compost and water situation. Since compost tea is mostly water, this is an important step.

If you want results like Matt's, contact Matt to have him set you up on a program.

But make no mistake, you will have to test!!! It can take up to two years to determine a specific custom blend for the combination of water and compost. This can't be done without the results from testing.

What we are seeing is that no one is doing an adequate job of figuring out "what a little of this kind of food, that kind of food, that kind of mineral" actually does. This approach is not working

for folks. If it was, there would be great results occurring everywhere with compost tea. Most people aren't doing the testing required. And so the results for many people are not stellar.

If adding biology is going to compete with the chemical system, we must have the results as compared to the chemicals. The bacteria can't be outrageously high, or too low. Fungal biomass must be in adequate range, and diameters must be 3 or greater. Protozoa must be present and active.

So, for those of you interested in these great results, please contact Matt Slaughter (541-257-2612) for more information, or Jennifer Appel, RLA, ASLA, LI, CSFIA, TX Landscape Architect # 1930, TX Licensed Irrigator # 4951, Certified Soil Food Web Advisor, 713-263-1682 office

2.b. More on the E. coli thing
…….(Thank you Joe Cummins, SANET!)

The investigation of the E coli 0157 outbreak from spinach has provided elegant insights into the spread of the toxic bacteria. E. coli is spread in surface water, from pasture grass, by flies, slugs and birds. Hopefully, all these avenues to spread of the toxic bacteria will be considered in the final report. CDC has not yet finalized the story.

Article published Oct 28, 2006
CSI-like E. coli probe most thorough ever. Investigators close, but still have not found definite source
By JULIANA BARBASSA The Associated Press

SAN FRANCISCO - Like lab technicians on a crime-scene television drama, investigators have tracked a strain of bacteria over thousands of miles - from bagged spinach in Midwestern refrigerators to the guts of a wild pig in the hills of the Central Coast.

While they may never pinpoint the exact source of the E. coli blamed for killing three people and sickening more than 200, they have come closer than ever before. And experts say the investigation has yielded valuable clues for preventing future outbreaks.

"We've completely overhauled the way we test and package greens," said Samantha Cabaluna, a spokeswoman for Natural Selection Foods LLC, the San Juan Bautista company that packaged the tainted spinach. "Regardless of the source or method of contamination, we're better prepared to catch it."

But that's little solace to victims and their families, for whom even a relatively fast and successful investigation like this one has seemed painfully long.

At first, there were only scattered reports of people falling sick. A 6-year-old boy in Wisconsin had bad cramps. A 12-year-old girl in Kentucky was hospitalized with vomiting. Then an elderly woman in Wisconsin died.

With similar food poisoning cases popping up in far-flung states, health officials began posting DNA profiles of the responsible bacteria to a national database operated by the Centers for Disease Control and Prevention.

A pattern emerged: They were all caused by the same strain of E. coli. It was clear that a widespread outbreak was under way. Epidemiologists zeroed in on a suspect lurking in victims' refrigerators: bagged spinach.

Suspicion quickly focused on the Salinas Valley, which grows a large portion of the nation's fresh spinach and was cited in other recent E. coli outbreaks linked to salad greens.

An unprecedented probe

State officials alerted the U.S. Food and Drug Administration on Sept. 13, and within hours, the agency had launched one of the most extensive investigations in its history.

"We put more people and far more resources into this than ever before," said Jack Guzewich, director of emergency coordination and response for the FDA's Center for Food Safety and Applied Nutrition.

More than two dozen "food detectives" fanned out across the country. They donned rubber gloves to collect spinach leaves from processing plants. They frightened cows found near fields of greens to induce defecation and collect their manure. They dipped beakers into water used to irrigate farms or wash the spinach.

More than 750 samples were placed in sterile, temperature-controlled containers, labeled, documented and delivered to labs for testing. Their aim: to determine where the contamination occurred along the greens' journey from field to fork.

The urgency of the investigation rose as the numbers of sick people mounted. When the California Department of Health Services issued a warning against eating bagged spinach Sept. 14, the spinach-borne O157:H7 strain of E. coli had been blamed in 49 illnesses across the country, and one death.

Preparing for next crisis

The detectives were armed with knowledge gleaned from eight previous investigations of outbreaks linked to California greens. Each had been a frustrating dead end, and the team was intent on achieving a different outcome this time.

Over the summer, FDA investigators were given special training on how to conduct field searches; growers, packers and shippers had been questioned about their practices.

"We knew there was a potential for problems there, and we wanted to be ready in case it happened," said Guzewich.

Meanwhile, patients were finding bags of leftover spinach in their kitchens. Tests done on the greens told detectives which bags were contaminated.

Codes printed on the bags led detectives to their first breakthrough: They were packaged at a San Juan Bautista plant operated by Natural Selection, one of the nation's biggest purveyors of bagged salads, which had already issued a pre-emptive voluntary recall.

The detailed coding told investigators the spinach was bagged Aug. 15 - even indicating the shift and packing line that handled it.

But exhaustive testing of the plant's equipment and water supply over the next several weeks turned up none of the virulent bacteria, according to health officials and Natural Selection.

Attention then turned to the fields. Using the company's records, investigators traced the spinach packaged that day to nine farms in three California counties - Santa Clara, San Benito and Monterey.

More contaminated spinach bags were found, with coding that narrowed the search to four fields, Cabaluna said.

Death toll rises

By early October, the death toll had risen to three, with many more sickened. The FDA said the strain of E. coli had been found in manure on a cattle ranch in the Salinas Valley, within a mile of spinach fields. Investigators combed the pastures, gathering more samples, including wildlife and cattle feces, stream water and spinach leaves.

On Thursday, the effort brought them closer than ever to identifying how bacteria contaminated vegetables implicated in an E. coli outbreak.

Six new samples from the ranch tested positive for the right strain of E. coli, including one found in the guts of a feral pig killed on the property. There also were signs that pigs had broken through a wire mesh fence to munch on the spinach, pointing to this field as a likely source of the outbreak, and to the wild pigs as probable carriers.

But officials said they're not ruling out that other fields may also have been a source of bacteria.

Either way, this investigation has already provided the most specific information to date for how a microscopic organism commonly found in animal feces can sicken and kill consumers thousands of miles from the source.

"We've never found that in past investigations," said Kevin Reilly, deputy director of prevention services for the California Department of Health Services.

The investigation continues, but with each day that passes the bacteria's tracks become harder to follow.

Solving cases difficult
After it's consumed, E. coli incubates for up to four days. The person who becomes ill might take a week to experience symptoms serious enough to see a doctor. Lab testing and comparing the DNA profile against others in the CDC's PulseNet database also take time.

In this outbreak, an average of 15 days elapsed between the onset of the first symptoms to the confirmation that the case was connected to the outbreak, according to the CDC.

The quick turnaround time for growing spinach and lettuce can also make it difficult to trace a pathogen to its origin. Fields of baby spinach are planted and harvested within three weeks, the soil is turned over frequently, and packing plants are supposed to be scoured clean every day, agricultural experts said.

"Coastal agriculture in California is extremely dynamic and fluid," said Steven Koike, a plant pathologist with the University of California, Davis. "There's a tremendous amount of activity that takes place in a short period of time."

The relative success of the spinach investigation means little to Ken Costello. His mother-in-law, Ruby Trautz of Bellevue, Neb., became sick after eating spinach salad for three meals in a row.

Trautz died on Aug. 31, before health officials were on the trail of the spinach outbreak, so she was never tested for E. coli. Connecting her case to the outbreak took a fair amount of detective work from Costello, who found the bag of spinach in her refrigerator, sent samples to a private lab, and eventually to state health officials.

Although she was the first person known to have died in the E. coli outbreak, hers was the last of the three fatal cases to be confirmed. "It was certainly too slow from the standpoint of any kind of prevention," he said. "And it caused tremendous emotional suffering and needless death."

October 28, 2006
Prof. Joe Cummins

2.c. *Routes to the spread of E coli 0157*

The impact of E coli 0157:
There has been some continuing effort to scape goat organic farms and food with the spread of toxic E coli 0157 even though organic certification entails methods such as composting of manures or grass feeding of food animals that actually eliminate the toxic bacteria. Composting eliminates E coli 0157 (1) but the actual facts seem to mean nothing for those opposed to organic food for on ideological grounds. The focus on ideology tends to obfuscate a threatening environmental problem (in much the same way that ideology diminishes the actual impact of global warming). There is a further complication; to quote the editor of the British Food Journal “A common misconception is that science and research are about facts” (2) that point of view is, unfortunately, pervading much of the views of organic agriculture expressed by its opponents who promote biotechnology.

E coli shiga toxin related outbreaks are growing throughout the world. In the United States alone 70,000 people each year are infected and made ill by E coli 0157, resulting in 2000 hospitalizations and 60 deaths. The annual cost of illness alone was estimated to be $450 million (3) while the cost to farmers and producers has not been estimated. The United States Center for Disease Control reviewed outbreaks of E coli 0157 between 1982 and 2002. 8,598 cases were compiled; these included 1,493 hospitalizations, 354 case of hemolytic uremic syndrome (HUS) an important source of renal failure in children and 40 deaths.

Transmission routes for infection included 52% food borne, 21%unknown, 14% person to person, 9% water borne, 3% animal contact and one case of laboratory exposure. The food borne illnesses was broken down as 41% ground beef, 23% unknown food vehicle, 21% produce, 6% other beef, 5% other food vehicle and 4% dairy. The produce outbreaks were distributed 34% from lettuce, 17% from apple cider, 16% from salad, 11% from coleslaw, 11% from melons, 8% from sprouts and 3% from grapes (4) E coli 0157 may be transmitted from mother to child leading to neonatal HUS(5).

Shiga toxin bearing E coli 0157 has been surveyed in agricultural fair livestock in the United States. The toxic bacteria were found in cattle, pigs, sheep and goats along with the feces of the animals and in fly pools. Cattle, swine and flies contained genetically identical E coli 0157. The toxic bacteria were found in the barns and fair grounds 11 months after the fair. 11% of the cattle, 1.2% of the swine and 3.6% of the sheep and goats were infected with E coli 0157 as were 5.2% of the fly pools. 31 of 32 state fairs had E coli 0157 infected animals. The toxic bacteria are commonly transmissible among animals at fairs and the bacteria persist a long time after the fairs are concluded (6) Dairy cattle at county fairs and farms along with their manure was studied for E coli 0157 in Minnesota. Cattle and feces from both organic and conventional farms were found to be infected about equally. The presence of such cattle at county fairs poses a tangible risk to the public attending the fairs (7). A comparison of Ohio and Norwegian dairy herds showed that none of the Norwegian herds were infected with E coli 0157 while the toxic bacterium was found in 5 of 750 dairy cows in Ohio. In Norway 1 of 50 feeds were contaminated with E coli 0157 while in Ohio while 19 out of 50 of the Ohio feeds were contaminated with the toxic bacterium(some feeds were highly contaminated). The difference between Ohio and Norway seems to lie with the farm management (8).

A British study of the presence of E coli 0157 and its vero toxin gene containing phage in feeds collected from feeding troughs or dry storage of commercial feed. 3% of the grass samples contained E coli with vero toxin while neither silage nor the commercial feeds contained the toxic bacterium The vero toxin containing phage was detected in only one grass sample and none of the other feeds. The study concludes that pastures potentially transmit vero toxin containing E coli (9). Cattle fed on pasture grass eliminate E coli 0157 within weeks of being put out to feed on the grass because the grass diet lowers the acidity of their digestive system and in that way

inhibiting the growth of the toxic bacteria (10). The significance of the British study may be that the contaminated pasture grass may serve as a long lasting source of contaminated surface water that spreads toxic bacteria to neighboring vegetable or fruit fields.

*Several wild animals carry E coli 0157 and deposit it into the environment from their feces:
*Along with the farm animals mentioned previously (1) a number of wild animals are known to carry the toxic bacteria and to distribute it in their feces. A New Zealand strain of vero toxin E coli 0153 was found to infect wild New Zealand rabbits (11). Presumably wild North American rabbits can and will spread E coli 0157. Racing, ornamental and city pigeons were implicated in the spread of vero toxin containing E coli (12). Rook feces were implicated in the spread of E coli 0157 to children in the United Kingdom (13). Slugs and their feces have been found to spread E coli 0157 in the United Kingdom (14). The house flies collected near homes of people infected with E coli 0157 (15) or house fly and stable fly larvae (16) proved to ingest E coli 0157 and to spread it. It is not surprising that flies are proving to be vectors for E coli 0157. Flies and manure go together like peaches and cream or Bush and Cheney. Wild animal vectors should be studied in every outbreak of vero toxin containing E coli.

Occurrence of E coli 0157 and its phage in the environment: Ecoli 0157 contains the shiga toxin gene encoded in a virus which is a prophage (integrated into the chromosome), the prophage can be activated to produce virus by stresses such as antibiotics, radiation or starvation. The bacteria phage is more resistant to water treatment than is the bacterium from which it originated. A number of water associated outbreaks have been observed worldwide associated with both inadequate drinking water purification and recreational use of waters. Irrigation waters have also been contaminated.. The virulence of shiga toxin producing E coli is determined by the shiga toxin gene along with virulence toxin genes associated with a plasmid. Water born transmission of E coli 0157 is considered a primary route for transmitting the pathogen (17). Phages bearing the shiga toxin gene have been identified in waste water and river water samples but at relatively low levels (18). New bacteria phages bearing a shiga toxin gene have been identified from E coli recovered from polluted waters in Spain (19).

Transduction of E coli using shiga toxin phage in the ileal loop of pig's intestines has been observed and in vivo conditions are more conducive to transduction of the shiga gene than is in vitro experimentation (20). Transduction of E coli by shiga toxin gene bearing phage was observed in sheep. Transduction was observed in 19 out of 24 sheep tested (21). The shiga toxin gene expression was activated by antibiotic treatment of the bacteria. Other activators of the bacterial SOS response not just the antibiotic activated expression of the toxin gene (22). The SOS response is a general response to agents such as mutagens, radiation or cell stresses The SOS response to gamma or x-irradiation is strong so that radiation of meats or vegetables contaminated with E coli 0157 may lead to excessive toxin content in the irradiated food.

In conclusion, E coli 0157 and its phage along with an array of shiga toxin producing bacterial strains is causing a growing threat to human populations worldwide. From a practical point of view rapid and inexpensive quick tests that can be used by farmers in the field are needed to identify pollution hot spots. It is unwise to rely on crop management practices alone but to have a means of getting on the spot information about the crop. Flies, birds, rabbits or even wild pigs are hard if not impossible to control completely. A neighboring pasture may graze cattle testing free of toxic bacteria but the pasture grass may contaminate the surface water flowing into your vegetable crop with its reservoir of E coli 0157. Playing a game of blame between organic and conventional farming will not solve the growing problem but research and cooperation may.

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2.d. Endocrine Disruptors found in water

The U.S. Geological Survey (USGS) has recently released a new fact sheet/report describing investigations that have taken place in Lake Mead, Nevada and Arizona, on synthetic organic compounds. These compounds potentially can cause endocrine disruption in common carp. The investigations, which began in 1995, have been a collaborative effort between the USGS, the National Park Service, the U.S. Fish and Wildlife Service, the Bureau of Reclamation, Texas Tech University, the University of Florida, Gainesville, the University of Nevada - Las Vegas, and the Nevada Division of Wildlife.

The studies, conducted in 1995 and 1999-2000, showed that male carp from Las Vegas Bay have low blood levels of androgen and smaller testes compared to male fish from reference sites. The same studies and others also showed the presence of higher levels of synthetic chemicals in water, sediment and fish from Las Vegas Bay compared to reference sites. In addition, commonly used products known as "emerging contaminants," such as triclosan (an antimicrobial drug used in soap), are being accumulated in fish from Las Vegas Bay. Other chemicals found in water, sediment, and fish in Las Vegas Bay include organochlorines (e.g., DDT and DDE), polycyclic aromatic hydrocarbons, furans, phthalates, phenols, and PCBs. Some of the chemicals present in Las Vegas Bay have been shown by laboratory studies to cause endocrine disruption in male fish.

New studies are now underway to assess the potential effects of drought-induced alterations in the hydrology of the lake and provide baseline information to monitor changes in contaminant distribution and potential for endocrine disruption that may occur due to the redistribution of wastewater inflow sites in the Lake Mead and Colorado River ecosystems. These new studies are wider in geographic and scientific scope and address not only endocrine disruption and the presence and distribution of chemical contaminants, but also contaminant sediment flux and microbiology, food web dynamics, and wastewater treatment effects. Such comprehensive studies have never been conducted within the Lake Mead National Recreation Area.

The 4-page report titled "Investigations of the Effects of Synthetic Chemicals on the Endocrine System of Common Carp in Lake Mead, Nevada and Arizona" is released as USGS Fact Sheet 2006-3131. The report is available on the Internet at

http://pubs.usgs.gov/fs/2006/3131/ .

Gerry Miller

To: organiclawncare@yahoogroups.com
Sent: Friday, October 20, 2006 11:54 PM
Subject: Re: [organiclawncare] USGS Monitors Endocrine Disrupting Compounds in Lake Mead

Gerry -

That's interesting . I just read a report in the latest issue of M.E.N.'s about anti bacterial soaps having the same effects and some of those same chemicals are the culprits.

What scared me the most was what it had to say about the effects to groundwater. I'm getting to the point that I don't think I even trust my well water , standard filtration systems or even distilled water which I drink alot of as it's only 59 cents per gallon.

The arguments expressed regards disease being spread just by what goes down peoples drains and ends up back in the water table are pretty frightening. Standard means of purification do

nothing to break down or kill these bacterium. Your neighbors disease ends up being your disease. Hate to add to anyones paranoia.

For those interested check out www.johnellis.com . I'm just started reading about him and wondering how his system would effect compost tea.

Jeff - jlrlawn