Black Gold, Biosolids, or Sca-doo: The risks of spreading sewage sludge on farmlands
What is Black Gold, biosolids, or sca-doo?

Solids/semi-solids from wastewater treatment processes

Anything that goes down a toilet, drain or sewer to a WWTP:

Homes, hospitals, industries, vet clinics, body fluids from medical waste and funeral homes, medical research labs, leachate from landfills

Free fertilizer, no longer legal to dispose sludge in ocean

Inexpensive method for WWTPs to dispose of sewer sludge

Claims: excellent nutrient content, soil amendment for crop growth

HUGE moneymaker for corporate companies like Synagro

The Federal Clean Water Act defines sewage sludge as a “pollutant.”

National organic standards prohibit use of sludge in organically-grown food products

The National Farmers Union opposes sludge to agricultural land

At least 8 major food companies prohibit purchase of produce grown on land “fertilized” with sludge due to potential liabilities
1988. Ocean dumping of sewage sludge banned in 1988 because it was destroying sensitive marine habitat.

1991. Needed to find a new avenue for disposal of sewage sludge. The Name Change Task Force at WEF convened to differentiate raw, untreated sewage sludge from treated and tested sewage sludge that used as fertilizer. Critics charged it was a move to make the product more acceptable to the public.

**Over 250 entrees:**

The winning name: BIOSOLIDS!
• 63% of 5.6 million tons of sludge generated in U.S. each year is land applied (NRC, 2002)
• 78 counties in NC have farmlands coated with sewage sludge.
• Hundreds of millions of gallons are spread on NC farmlands each year.

*2007 DWQ stats per year
Orange: 19,319,988 gal on 1817.76-acres
Chatham: 19,982,500 gal on 1151.33-acres
Alamance: 19,789,200 gal on 969.20-acres
Union County: Over 11,000-acres permitted for sludge

*Based on av. 20,000 gal per acre = 220,000,000 gal. per yr.
Treatment and testing consists of:

Lime stabilization and aerobic digestion to “disinfect” sludge by reducing organic matter, pathogen content, offensive odors.

Testing required for 9 metals, nutrients, total coliform once per week or less depending on volumes produced.

Other methods of getting rid of sludge: incineration, land filling, pelletizing, composting using “Class A” sludge.

Testing of soils that receive sludge – once per year.

Shipped to and spread on farmers’ fields free of charge, told nutrients in sludge are beneficial to crop growth.
WWTPs do not test or remove:

- Unregulated chemicals
- Emerging chemicals
- Specific pathogens (MRSA, swine flu, H1N1 viruses, Tamiflu vaccine, hepatitis A, Herpes virus, Poliovirus, Necrotizing bacteria)
- Prescription pharmaceutical drugs
- Illegal drugs
- Hormones
- Steroids
- Endocrine disrupting chemicals
- Flame retardants
- Radioactive substances
- Toxic metals
- Polychlorinated biphenyls
- Dioxins
- PAHs (polycyclic aromatic hydrocarbons)

84,000 chemicals in commercial use, approx 700 new chemicals introduced into hands of consumers each year.

Nearly 20 percent of chemical ingredients protected as trade secrets, some pose “substantial risk” to public health and environment.
(2008). EPA’s “Targeted National Sewage Sludge Survey” (TNSSS) sampled 74 selected waste water treatment plants in 35 states during 2006 to 2007. The survey identified high concentrations of toxic contaminants with heavy metals, steroids and pharmaceuticals, including the antibacterials, triclocarban and triclosan. Despite the prevalence of these toxic chemicals in the environment and their potential adverse impacts to human health and the environment, EPA maintains that it is not appropriate to speculate on the significance of the results at this time.

Under the Clean Water Act (CWA), Section 405(d) stipulates that EPA must identify and regulate toxic pollutants that may be present in biosolids (sewage sludge) at levels of concern for public health and the environment.

http://www.epa.gov/waterscience/biosolids/tnsss-tech.pdf
Triclosan/ triclocarbon

- Widely used in consumer and household products ranging from dish washing liquids, detergents, hand soaps, toothpastes, deodorants.
- Known endocrine disrupting chemical, shown to affect male and female reproductive hormones, potential increase for cancer risk.
- Destroys reproductive systems of fish, other aquatic life.
- May cause bacteria to become resistant to commonly used drugs (i.e., amoxicillin).
- Found in urine of 75% percent of the U.S. population.
- No more effective than plain soap.
- Detected in Triangle surface water samples (USGS study).
- EPA study: Triclocarban #1 chemical detected in all 84 samples collected, most highly detected pharmaceutical (4.41×10^-5 ug/kg).
- Triclosan #2 chemical detected in 79 out of 84 collected samples. Second highest concentrations (1.33×10^-5 ug/kg).
- Studies: triclosan decays to dioxin under UV light.
- 70 consumer groups have petitioned EPA to ban all non-medical uses of triclosan.
Johns Hopkins studies (*Rolf U. Halden et al*) conclude that 50 percent of triclosan and 76 percent of triclocarban remain unchanged by aerobic and anaerobic digestion in a typical WWTP. Both accumulate in sludge. Estimate that more than 100,000 lbs. of triclosan and 300,000 lbs. of triclocarbon are spread on farmlands each year.

Scientific evidence linking endocrine disrupting compounds to breast cancer risk is substantial and growing.


A new study conducted by the University of Minnesota has found that vegetables such as corn, potatoes and lettuce absorb antibiotics when grown in soil fertilized with livestock manure.


Switzerland has banned the application of sludge on farmlands (2003)

Although sludge contains plant nutrients such as phosphorus and nitrogen it also comprises a whole range of harmful substances and pathogenic organisms produced by industry and private households. For this reason, most farmers already avoid using sludge as a fertiliser since they are aware of the risk of irreversible damage to the soil, the danger to public health and possible negative effects on the quality of the food they produce.

A 2008 study conducted by USGS and Colorado State University at Pueblo concluded that organic chemicals introduced to the environment via land application of sewage sludge and manure are transferred to earthworms and enter the food chain.

Earthworms collected from both fields with sludge and manure were analyzed for 77 different chemicals; 20 chemicals were detected in the earthworms. The chemicals included disinfectants, fragrances, antibiotics, detergent metabolites, pharmaceuticals, flame retardants and other compounds. Detergent metabolites and triclosan were found in earthworms from the biosolids-applied field, but not the manure-applied field.

http://toxics.usgs.gov/highlights/earthworms
On Nov. 9, 1998, McElmurray & Sons, Inc., and Boyceland Dairy Farms, filed separate lawsuits against the City of Augusta in the U.S. District Court in the Southern District of Georgia, after the deaths of hundreds of dairy cattle and loss of hundreds of acres of productive farmland as a result of elevated levels of thallium, arsenic, chromium, PCBS, and molybdenum found in sewage sludge used as a fertilizer in 1998. Cadmium and molybdenum were recorded at 37-1,400% higher than permitted levels.

http://www.organicconsumers.org/articles/article_10789.cfm
Milwaukee, WI. (2007). City spent over $4 million to scrape tons of Class A sewage sludge “Milorganite” off 30 public parks and playgrounds because it was contaminated with toxic, carcinogenic PCBs (polychloride biphenyl ethers). Some PCB levels in the sludge exceeded EPA superfund limits. Three more incidents of PCB contamination followed.

Raleigh, NC (2008). The City of Raleigh spent $15 million to extend municipal water lines to residences with nitrate contamination to 16 private drinking water wells as a result of over-application of sewage sludge by the city. Sludge runoff polluted the Neuse River, a drinking water resource for communities downstream of Raleigh.

Dalton, GA. (2009). Spreading of “biosolids” from the sewer plant in Dalton, Georgia, was halted when high levels of PFOAs and PFOs were found in the sludge, which had been composted and sold to businesses and individuals in the Dalton area since 2003. Dalton Utilities estimated that 80 million pounds of the compost were sold and distributed. The Georgia Environmental Protection Division found the chemicals in soil, groundwater, and surface waters, including the Conasauga River and Holly Creek. Chemicals also found in bass and catfish. An impact study (including blood and tissue analyses) on deer and turkey are being planned to determine potential impacts of PFOA and PFOS on the local wildlife population.

*Note: EPA national drinking water PHAs for perfluorooctanoic acid (PFOA) = 0.4 ppm micrograms per liter and PFOs = 0.2 ppb. PFOA values ranged from 1,900 to 4,500 ppb and PFO values ranging from 210 to 2,500 ppb. The one sample of fresh sewage sludge had a concentration of PFOA of 91 ppb and PFOS of 210 ppb.

Lawrence County, Al. (2009) Farmers filed a class action lawsuit against Synagro, and local industries which discharged toxic, carcinogenic PFOAs and PFOS (*perfluorinated chemicals, used in manufacturing Teflon products) into the sewers, resulting in sludge contamination of 5,000 acres of private drinking water wells, farmland, and livestock. PFOAs and PFOs are carcinogenic to animals, and have been linked with birth defects, cancer, immune dysfunction, and liver damage. Synagro stated it did not test the sludge from Decatur Utilities for PFOAs because it did not know the sludge contained the compounds.

http://www2.fluoridealert.org/Pollution/Perfluorinated-chemicals/Alabama-PFOA-contaminated-sludge-spread-in-Lawrence-County
St. Joseph, MO. (2009). At least two dozen northwest Missouri landowners filed a lawsuit against the former and current owners of a tannery, the chromium manufacturer, and engineering firm that designed sludge system that provided chromium-tainted sludge for use as a fertilizer on farms. Several other lawsuits filed alleging the hexavalent chromium (chrom 6) found in the sludge caused a cluster of brain tumors.

Osceola Mills, Pa. (1994) 11-year-old Tony Behun died after he rode his dirt bike through a field of freshly spread sewage sludge. He became ill 2 days later and died six days later in Allegheny County hospital of Staphylococcus aureus.

Greenland, N.H. (1991) Twenty-six year-old Shane Conner died after being exposed to sewage sludge being spread on a field next to his house. Conner family filed a lawsuit against Synagro that resulted in a settlement and gag order on Conner family.
Harford County, MD. (2008) A 51-yr. old woman, Lin Eyer, rode her horse through a field of freshly spread sewage sludge in the Susquehanna State Park and one week later became ill with an infection which physicians could not identify. A dentist removed all of her teeth in an attempt to stop the infection. Bills introduced in the Maryland General Assembly to ban companies from leasing parkland to spread sludge. Efforts by residents to stop the sludge spreading by Texas-based Synagro were finally successful.

A University of Toledo study (2007) of residents living in Wood County, OH, near farm fields permitted to receive sludge found increased risks for certain respiratory, gastrointestinal, and other diseases among residents.

“The spreading of Class B sewage sludge on farmlands should be banned immediately.”

Dr. Ellen Harrison, Former Director
Cornell Waste Management Institute

*Conclusion reached after a 2002 study if 328 symptoms at 39 incidents of sludge spreading in 15 states.

“Our ability to confidently predict risks from land application is very limited; contaminants concentrate in sludge and many are unevaluated; present standards for risk are based on a risk assessment with many short-comings; enforcement and monitoring are inadequate; if there are problems they are hard to prove.”

Dr. Murray McBride, Soil Scientist
Cornell Waste Management Institute
The Federal Clean Water Act defines sewage sludge as a “pollutant” [33USC 1462 (6)].

Part 503.9(t) Pollutant is an organic substance, an inorganic substance, a combination of organic and organic substances, or a pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could, on the basis of information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction), or physical deformations in either organisms (humans) or offspring (children) of the organisms.
“Agriculture is not a place to dump unwanted things; our agricultural soils are unique, we depend on them, we don’t create new ones ... and when they become severely contaminated, you have a real problem.”

Ellen Harrison, Director
Cornell Waste Management Institute
Interview, “The Sludge Diet,” 2008
On July 13, 2000, the US House Science Committee held a hearing on the 1999 National Research Council report entitled "Strengthening Sound Science at the US EPA". The 503s were singled out as an example of regulation that is being driven by politics, rather than by sound science.
For information on references regarding statements and studies referenced in this presentation contact:

Blue Ridge Environmental Defense League
NC Healthy Communities
Sue Dayton, Statewide Coordinator
(336) 525-2003
sdayton@swcp.com