

# Awash in Waste

---

When Congress banned ocean dumping of sewage sludge in 1992, many municipalities in the United States began spreading it on farmland. In the state of Maryland, 95 percent of the sewage sludge, which the EPA calls biosolids, is spread on farmland.

It is true that humanure is rich in nitrogen and phosphorous and high in organic matter, which increases soil tilth, soil porosity and water holding capacity. But sewage contains so much more than just humanure.

One sewage treatment plant might receive wastes from 100-200 companies, which means thousands of chemicals will be present in a single sludge: brominated flame retardants, PCBs, pesticides, including DDT, dioxin, radioactive material, asbestos, mercury, lead, cadmium, zinc. It's an endless list.

Dr. Murray McBride, a professor of soil chemistry at Cornell University who has studied sewage sludge for 20 years, said thousands of chemicals that can be in sludge have not been researched to ensure that plants do not take them up or to ensure that they degrade in the soil quickly enough.

He also expressed concern about grazing cattle ingesting dust and soil that is laced with such chemicals as dioxins, which he said can persist in the soil for

decades, polybrominated diphenyl ethers, (flame retardants), which behave a lot like PCBs, as well as surfactants from certain dishwashing detergents and laundry detergents that are broken down into nonylphenol, an endocrine disrupting chemical. "The list is very long. ... The chemicals concentrate in body fat, which means it can be in the meat and milk," he said. "In fact, the concentration in the milk fat would be perhaps even higher than in the soil, so there's a concentrating effect."

Also significant, he said when sewage sludge is added to soil "there 's a tendency for the soil ph to drop, which means every heavy metal we worry about, including cadmium, zinc and copper, becomes more soluble and much more plant available." But he added, generally speaking, that metals are not showing up in cow's milk.

In a testimony before the Pennsylvania House of Representatives, a chemist who studied the effects of lead on soil and groundwater for 25 years said, "One application of sludge adds more lead to the soil than did 50 years of using leaded gasoline."

The chemist, Dr. Stanford Tackett, who is a professor emeritus at the Indiana University of Pennsylvania, said in a published article, "In heavily traveled areas, the use of leaded gasoline was adding lead contamination to the soil at a rate

of about 1 pound per acre per year. That pollution was severe enough to cause the banning of lead from gasoline. In spite of that, the Pennsylvania Department of Environmental Resources regulations allow 100 pounds of lead per acre from sludge for stripmine reclamation, and 60 pounds of lead per acre for agricultural use."

According to him, "lead doesn't deteriorate. It just stays there in the soil."

He says, "Lead is taken up by the plants at low levels and is in the leaves of the plant, or in the fruit or whatever. When that food is processed, those low levels of lead are there. ... The body has no mechanism for eliminating the metals so they are accumulated in blood, bones and body organs. Because of this cumulative nature, heavy metals pose a hazard at any concentration level. ... It will affect children over time. If they just eat one carrot, lets say, that has taken up some lead, it probably won't do any harm. But if that is part of their regular diet, day in and day out, week in and week out, then the heavy metals pose a hazard."

Tackett explained, "Young children may eat only one quarter as much as an adult, but they absorb four times as much of the ingested lead as an adult."

Revealing the seriousness of this issue, he said, "Absorption of even trace concentrations of lead during the years of most rapid brain growth, from birth to 5 years, can cause permanent mental retardation. ... A significant majority of U.S. children already have a blood lead burden greater than 10 ug/100g of blood (0.10

ppm). Thus, an increase in lead level of even the slightest amount in these children will probably lead to an increased severity of health problems."

In addition, he said, "Lead also interferes with the blood-forming process, vitamin D metabolism, kidney function, and the neurological process. It has been associated with hypertension in adults."

Dr. McBride said he is even more concerned about lead from sludge in dust that gets on leafy vegetables such as lettuce or spinach. "You can wash the leaves but a lot of that dust won't come off, so you come up with higher levels of lead," he said. "We are at a point where we do not want to in any way increase the burden of lead in human diets."

Studies show that sewage sludge can also contain many pathogens linked to such ailments or diseases as polio, cholera, tuberculosis, staph, tetanus, hepatitis, HIV, rocky mountain spotted fever, encephalitis, hemorrhagic fevers, typhoid fever, bloody diarrhea, infant diarrhea, anthrax, skin infection, pneumonia, abdominal inflammation, weight loss, weakness, chills, fever, anorexia, weil's disease, urogenital tract infection, skin infection, neurological disorders, gastroenteritis, vomiting, restlessness, intestinal inflammation, digestive disturbances, nervousness, anemia, respiratory effects, hook worms and more.<sup>1</sup>

An 11-year-old boy from Pennsylvania, Tony Behun, grew suddenly ill with skin lesions, fever and respiratory problems after riding his bike through a mine reclamation field where sludge was being dumped. He died four days later.

In Augusta, Georgia, 300 cows died on a dairy farm receiving sewage sludge. The Boyceland Farm was the only farm where cows were dying and the only farm in the area receiving sewage sludge. The farmer, Bill Boyce, sued the city of Augusta and the court awarded him \$550,000 in damages.

When the National Organic Program considered allowing sewage sludge to be spread on organic farmland, the agency received close to 275,000 letters in protest. As a result, biosolids are not allowed on farms that are certified organic.

What should be done with humanure? Dr. Tackett recommends incineration with scrubbers that take out the contaminants, but he says this is very expensive.

Endnote:

---

<sup>1</sup> Eliot Epstein, "Pathogenic Health Aspects of Land Application," Biocycle, Sept. 1998.