



Information Update:

Biosolids and the White House Garden

August 12, 2009

Background

Lead in the soil of the White House garden is a biosolids-related internet story gone “viral.” On August 3rd, almost 7 weeks after the story was first broken by [Mother Jones](#), [Eddie Gehman Kohan](#) of the White House blog *Obamafoodorama* [wrote](#) “In the last two weeks, the lead myth has returned with a vengeance, in stories with inflammatory headlines such as ‘Michelle Obama's Toxic Veggie Nightmare.’ This, despite the fact that lead as a toxic issue in the garden has been debunked by major soil scientists, in interviews with your intrepid blogger that appeared [here](#) and on [Huffington Post](#).” But the issue is once again making the rounds. Ms. Kohan quips: “The President has birthers; the first lady has leadites.”

The lead story was triggered by a standard soil test in the spring of 2009, something you do when you start a garden. The National Park Service took the [soil sample](#) and A & L Eastern Lab of Richmond, VA did the analysis. The level of lead in this one sample was 93 parts per million (ppm). The White House lawn is located in a city, and cities often have high soil lead levels. This comes from air pollution, lead paint, and lead-based pesticides used in the past.

Understanding the Lead Concentration

A review of literature on lead in urban soils revealed several articles. One, done by the [University of Illinois at Chicago](#), noted a median soil lead level of 1,773 ppm, with a range of 175-7,953 ppm. So, in that study, the median value, the one in the middle of all the samples, is about 19 times higher than the result of the soil test of the Obama’s garden. Ryan et. al. (*Environmental Sci & Tech*, 2004) note that urban median lead levels often exceed 1,000 ppm, with “reported values as high as 50,000 mg Pb/kg.” Agricultural soils average 11 ppm, with a range of 1 to 135.

So, elevated lead levels are a fact of life in an urban setting. And, as several of the experts in the [Eddie Gehman Kohan](#) story noted, the 93 ppm level in the Obama garden is not surprising and not a significant health concern.

Did Use of Sewage Sludge Contribute to the Lead Concentration?

The material that was applied to the White House lawn was not untreated sewage sludge, but biosolids compost.

What is the difference?

The treatment of wastewater produces two things – clean water and a liquid or semi-solid residual – sewage sludge. Sewage sludge has been used for at least 150 years as a fertilizer, and for much of that time it received little or no additional treatment. Now, however, sewage sludge must be processed and tested before it is allowed to be placed on land as a soil amendment or fertilizer. Federal and state regulations require this processing, the intention being to destroy the majority of disease-causing organisms in the sludge and to reduce odors and other characteristics that might make it more attractive to “vectors” – e.g. flies and rodents. Once treated and tested (demonstrating that regulatory standards have been met), the material is considered “biosolids” (for more on this term, see [here](#)). There are a variety of ways to process sludge into biosolids; the one used to create the material applied to the White House lawn was composting.

The application of the biosolids compost was many years ago, and biosolids compost is just one of many soil amendments on the market that, once produced, does not need to be tracked. This makes it difficult to know for sure what its quality might have been (other than that it met regulatory standards). An August 12th *New York Times* [story](#) and the White House Garden [blog](#) say that there was only one application of biosolids compost – in 1985. There are records that indicate the compost came from the Montgomery County Biosolids Composting Facility, which, up until 1999, treated some of the sewage sludge generated at Washington’s Blue Plains Wastewater Treatment Plant, as well as other facilities in the DC area. There is data available on the [quality](#) of this material, as well as the quality of the sludge from Blue Plains. This data is not necessarily for the exact material applied, but the quality of biosolids tends to be consistent. The quality information shows the Blue Plains sludge had a lead content averaging 43.9 ppm and the finished compost averaged 15.7 ppm.

The question then arises, was the biosolids compost actually applied to the location of the current garden? Dr. Rufus Chaney of the USDA, a research scientist with particular expertise regarding metals in soils, reviewed the spring 2009 White House garden soil test data and concluded: “The available Cu [copper] and Zn [zinc] are a little higher than found in background Maryland soils, so I believe it is possible that compost had been applied to these soils.”

So, the data for biosolids compost likely applied to the White House lawn (now garden) shows lead levels were about 15.7 ppm. This is in the typical range for biosolids composts. One or a few additions of compost of this quality would not raise the soil lead levels to 93 ppm. The White House garden’s minimally elevated lead level was likely there before the compost was applied.



Before (left) and after photos of an application of biosolids compost to the White House lawn, probably from 1985. These photos were used in a Washington Suburban Sanitary Commission brochure. Note that this use of biosolids was for installation of new turf. Biosolids compost and other soil amendments can also be lightly topdressed on existing turf.

The August 12th White House Garden blog and *New York Times* story noted that a mid-summer 2009 soil test revealed a lead level of just 14 ppm. This, the story states, was due to adding compost and other amendments to the soil. It could also be partly due to the variability caused by

sampling and testing (which is why scientists require many samples for research purposes, whereas home gardeners usually obtain enough information from one properly collected sample).

Organic or Organic?

A sideline in the viral White House garden lead story has been about whether the garden is or could be “organic.” The primary definition of “organic” refers to chemical compounds that contain carbon and materials derived from plants and animals (which contain carbon). The more recent definition refers to soil amendments, crops, and food that are produced without synthetic inputs, such as chemical fertilizers and pesticides. The USDA [organic rule](#), which governs what food products can be labeled “organic,” does not allow the use of biosolids, because they are considered to be synthetic. However, biosolids are not that different from animal manures: both are good organic (derived from plant and animal matter) soil amendments because they provide slow-release nutrients, help build soil tilth and water-holding capacity, and sequester carbon.

The fact that biosolids compost was applied to the White House garden site years ago does not disqualify the site from being certified organic. That official designation would come after three years of recordkeeping and the documented use of allowed fertilizers, soil amendments (not including biosolids), and other inputs. Ironically, municipal yard waste compost could be used in a certified organic garden, even though the mean concentration of lead in such [composts](#) is 49 ppm, with a range of 1 – 380 ppm. Like biosolids compost, the yard waste compost, with its somewhat elevated lead level, does not present any significant health risk in a properly managed garden.

But, as Lynn Sweet, Washington Bureau Chief of the *Chicago Sun-Times* and a columnist at *Politics Daily*, notes in an August 3 [article](#), “By the way, the East Wing reminded me that the garden was never intended to be an organic garden, as defined under federal guidelines,” even though the White House gardeners are generally following organic gardening practices.

Are Biosolids Safe to Use on Soils?

As regards the opinions, specifically about the nature and potential risks of using biosolids on soils: there is an extensive body of scientific research literature on the use of biosolids on soils, going back 30 years and more. The EPA relied on this research and an environmental and health risk assessment when they developed the current [biosolids regulations](#) in 1993. States have created additional regulations. Currently, about 55% of the country’s biosolids are beneficially reused (see report at left side of this [website](#)). Federal regulations and (to the best of our knowledge) all state regulations put no restrictions on use of Class A biosolids – such as biosolids compost or the heat-dried fertilizer Milorganite® – for growing food crops (although some producers or distributors choose to discourage it).

Research has led to regulations and best management practices that have addressed the most significant potential risks from biosolids use. But, as our ability to do analyses gets better, we find more things in both treated wastewater and biosolids. For example, some chemical compounds are being found in very small quantities. When composted and/or applied to land, most are broken down by sunlight, soil organisms, and natural soil chemical reactions. In particular, there is current interest in the occurrence, fate, and possible impacts of traces of pharmaceuticals and personal care products in biosolids. What is clear from research so far is that human exposures to these chemicals are far greater through daily use of products and their decay and distribution in our living spaces. But research on this and other topics continues, with the aim of continually improving understanding and management of biosolids.

The people that design and operate wastewater treatment plants and biosolids management programs are professional environmentalists. Protecting our nation's water and soil are their top priorities.

Conclusions

Thousands of research papers and long-term uses of biosolids in agriculture, horticulture, and landscaping indicate that we do know how to safely utilize this valuable material, recycling the nutrients and organic matter it contains.

Sewage sludge is not optional: it is a necessary part of clean water programs. It can be incinerated, placed in landfills, or recycled to soils and for energy. Each option has benefits and risks. Use on soils provides, by far, the greatest benefits: demonstrated improvements to soils and crops. And, with proper management, the risks are "negligible," as concluded a 1996 National Academy of Sciences review of biosolids use on food crops.

Lead in urban soils – at much higher concentrations – can be a problem. The minimally elevated level of lead found last spring in the Obama's garden – wherever it came from – is not. And biosolids compost was certainly not a significant source of lead at that site.

An electronic version of this document is available at
<http://www.mabiosolids.org/docs/WhiteHouseGarden&BiosolidsAugust09.pdf> or
<http://www.nebiosolids.org>

The Mid-Atlantic Biosolids Association (MABA) cooperatively fosters public understanding and environmentally sound management of biosolids. It is a solution-oriented organization, providing technically sound information, leadership, and coordination in the field of biosolids management. MABA members include leaders in biosolids management in the Mid-Atlantic states of MD, NJ, NY, PA, VA, and Washington, DC. For more information: Michael Wardell, Executive Director, (845) 901-7905, or <http://www.mabiosolids.org>.

The North East Biosolids and Residuals Association (NEBRA) is a 501(c)(3) non-profit professional association advancing the recycling of biosolids and other organic residuals in New England and eastern Canada. NEBRA membership includes most of the environmental professionals and organizations that produce, treat, test, consult on, and manage the region's biosolids and other large volume recyclable organic residuals. NEBRA is funded by membership fees, donations, and project grants. Its Board of Directors are from MA, ME, NH, VT, and New Brunswick. NEBRA's financial statements and other information are open for public inspection during normal business hours. For more information: Ned Beecher, Executive Director, 603-323-7654, or <http://www.nebiosolids.org>.