

## **Lead and other metals in New York City community garden soils**

The [Healthy Soils, Healthy Communities](#) team published a study of metals in NYC community garden soils in the April 2014 issue of the journal *Environmental Pollution*. The study, which involved testing more than 500 soil samples from 54 community gardens, found that levels of lead and other metals, while higher than background levels found in rural soils, were similar to levels found in other studies of urban soils in NYC and other cities. Urban soils can have higher levels of lead and other contaminants because of human activities such as waste incineration, coal and oil combustion, and the past use of leaded gasoline and paints containing lead and other metals.

The *Healthy Soils* team shared soil testing results, interpretation of results, and advice on healthy gardening practices directly with gardeners at the time of the study (from 2009 – 2011), and NYC Parks GreenThumb prioritized clean soil deliveries to the study gardens with the highest lead levels in soil.

The study compared metals levels in NYC community garden soils to health-based guidance values based on [soil cleanup objectives](#) for residential properties in New York State's environmental cleanup programs. Most of the samples were below those guidance values, which is good news for gardeners, but a fraction of the soil samples – about 10 percent – had lead levels above the guidance value. All in all, 28 of the 54 gardens had at least one soil sample above the guidance value for lead. Another metal, barium, was above guidance values in 14% of the samples, but is likely present in a much less toxic form than the guidance values assume. Other metals, including arsenic, cadmium, and chromium, were below guidance values in nearly all samples.

Exposure to lead can pose a [health risk](#), particularly for young children, and it's a good idea to reduce exposure whenever possible. Gardeners can reduce exposure to lead and other soil contaminants by following [healthy gardening practices](#), such as planting in raised beds and adding clean soil and compost to garden beds. We found that many gardeners are already doing this effectively. Garden beds (which are often amended with clean soil and compost) had lower levels of lead and other metals than non-growing areas, and raised beds had lower levels than beds planted directly in the ground.

Metals levels varied widely within individual community gardens. For example, on average, the highest lead level in a garden was 10 times higher than the lowest level. This variability can pose a challenge for gardeners trying to characterize their garden soil on a limited budget, as testing for lead and other contaminants can be expensive. Less costly (and more common) general soil quality testing may help guide efforts to measure contaminant levels, however. In this study, soils with higher pH and higher levels of the micronutrient zinc tended to have higher levels of lead. Testing of pH or zinc, commonly part of affordable soil quality tests offered by Extension laboratories, could help gardeners identify areas where further testing might be desirable.

The study concludes that, even though levels of lead and other metals were below guidance values in most NYC community garden soil samples, urban community gardeners would benefit from continued efforts to reduce exposure to lead, and the widespread adoption of healthy gardening practices should be encouraged. The full *Environmental Pollution* article is available to journal subscribers [on the journal's website](#), and you can also read it [here](#).

**Internet resources and references linked from page 1:**

[Healthy Soils, Healthy Communities webpage](http://cwmi.css.cornell.edu/healthysoils.htm): <http://cwmi.css.cornell.edu/healthysoils.htm>

New York State Remedial Program [Soil Cleanup Objectives](http://www.dec.ny.gov/regs/15507.html): <http://www.dec.ny.gov/regs/15507.html>

“[health risk](http://www.health.ny.gov/environmental/lead/)” NYS DOH lead (Pb) webpage: <http://www.health.ny.gov/environmental/lead/>

Advice on [healthy gardening practices](http://cwmi.css.cornell.edu/healthysoils-3.htm): <http://cwmi.css.cornell.edu/healthysoils-3.htm>

[Full Environmental Pollution article on journal's website](http://dx.doi.org/10.1016/j.envpol.2014.01.007): <http://dx.doi.org/10.1016/j.envpol.2014.01.007>

[Full unformatted article on NYS DOH website](http://www.health.ny.gov/environmental/outdoors/garden/docs/soilpaper.pdf):

<http://www.health.ny.gov/environmental/outdoors/garden/docs/soilpaper.pdf>