

Describing urban garden soil lead levels

Objective: To compare three different ways to measure lead in urban soil, to look for trends in lead levels between styles of gardening and geographic location, to educate and provide resources for urban gardeners.

The gardens: We sampled 10 gardens in different neighborhoods in Chicago. Some gardens grow directly in the ground while others use raised beds or grow in compost on a paved surface. We also sampled from non-growing areas near the gardens where people may be exposed to soil.



Testing methods: We will test the soil for lead in three different ways because some methods describe the total amount of lead in soil while other methods describe the amount of lead that is bioavailable. One of these methods is a bioassay using a nematode test organism (*Caenorhabditis elegans*). When we conduct the bioassay, we will test the soil without additives and again after adding a phosphorus compound which may tie up the soil lead, making it unavailable to plants for uptake.



We will add apatite (calcium phosphate) to our soil samples to see if the resulting metal phosphates are no longer available to our test organism. Your teeth are made of apatite!



The Mehlich III method for extraction, developed by Dr. Adolf Mehlich, can describe plant available lead rather than total soil lead.

Collaborative Research:

University faculty and students, participating gardeners, non-profits in Chicago, generous grant givers and Cooperative Illinois Extension worked together on this project. It is part of Laura Witzling's masters thesis under the direction of Dr. Michelle Wander in the Department of Natural Resources and Environmental Sciences. The project received funding from NCR-SARE and the Community Informatics Initiative.



USQI: As part of this project, we also developed the Urban Soil Quality Initiative (USQI), hosted by the Agroecology and Sustainable Agriculture Program (ASAP). USQI is a web space that provides a place for urban gardeners to post and find resources, list upcoming events, and ask and answer questions in a chat forum. We think of it as an electronic community garden where participants can pass information on without being in the same place!