

Soil Contaminants in the Garden:

Should I Be Concerned?



What are Soil Contaminants?

Soil contaminants are naturally occurring or human made chemicals that can have negative impacts on human and plant health. Contaminants may be present in soils from past land use activities, such as the historic use of lead paint, pesticides, treated wood, or from being close to heavy traffic areas. Soil contaminants can also be created from industrial activities and can get into soil from spills, runoff, wastewater, or from air emissions that settle onto soil or water.



Common Contaminants and Sources

Lead	historic gasoline & paint use, coal ash, used batteries
Arsenic	treated wood (pre-2003), pesticides, coal ash
PAHs	vehicle emissions, asphalt, fires
Cadmium	phosphate fertilizers, tires, vehicle exhaust
Mercury	paint, power plant emissions, thermometers
Pesticides	past land use; disposal of pesticide containers

How Can Soil Contaminants Get Into Our Bodies?

Activity	How can I limit my exposure?	
Breathing in soil dust	-Water your garden to reduce dust production -Apply mulch on the soil surface	
Direct contact with soil	-Wear gloves when gardening and wash hands after -Avoid tracking soil into your home	
Eating contaminated produce	-Avoid planting root and leaf crops in contaminated soil -Peel produce in direct contact with soil	
Direct ingestion of soil	-Avoid hand-to-mouth activity while in the garden -Thoroughly wash all produce	

How Can we Reduce Contaminants in Gardens?

- Add organic matter - it can bind contaminants and help to dilute contamination
- Cap existing soils by building raised beds or replace the contaminated soils
- Choose your vegetables wisely; avoid leafy crops and roots in contaminated soil
- Watch the acidity of your soil - aim for a pH around 7 (neutral - not acidic or basic)
- If you think your soil may be at risk of contamination, you may want to have your garden soil tested for contaminants



How can Soil Contaminants Affect Our Health?

Soil contaminants can have a variety of impacts, but due to the low exposure levels, we are most concerned about long-term health effects from soil contaminants that may take years to develop or contribute to long-term illnesses or impairments.

The Duke Superfund Research Center is focused on early life exposures and their later life consequences. For this reason, the groups we're most concerned about for exposure are children and women of child-bearing age. These groups are more sensitive to soil contamination because of their developmental stage.



Where Can I Get More Information?

- **NC Community Garden Partners:** <http://www.nccgp.org/>
A Broad network of partner gardens in NC and a rich library of resources for gardeners
- **North Carolina Cooperative Extension/NCSU:** <https://www.ces.ncsu.edu/contact-us/>
Local Offices that can help with everything from safe gardening practices to master gardening techniques • Offers soil testing services for nutrients and pH, not contaminants
- **Soil Testing:** <https://foodsafety.ces.ncsu.edu/foodsafety-soil-testing/>
Soil testing labs at NC State provide free testing services to large-scale commercial farmers at no charge. Individual lab soil testing is available for ~\$30-\$60 per sample, per contaminant.
- **ATSDR TOXFAQs:** <https://www.atsdr.cdc.gov/toxfaqs/Index.asp>
Series of summaries that respond to frequent questions about hazardous substances
- **EJSCREEN - EPA Environmental Justice Screening Tool:** <https://www.epa.gov/ejscreen>
Combines environmental and demographic indicators in maps and reports
- **NCSU Extension-Therapeutic Horticulture:** <https://therapeutic-hort.ces.ncsu.edu/gardening/>
Links to valuable information like soil contamination, heavy metals in soils, and soil testing

About the Duke Superfund Research Center: We focus on early life, low-dose exposures to toxins and their effects on human development that emerge later in life. We connect with government agencies, industry professionals, community organizations, K-12 teachers, and others to bring research and useful information about environmental health and toxic exposures to the public.