

# 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

<b>Lead</b>	Historic gasoline & paint use, coal ash, used batteries
<b>Arsenic</b>	Treated wood (pre-2003), pesticides, coal ash
<b>PAHs</b>	Vehicle emissions, asphalt, fires
<b>Cadmium</b>	Phosphate fertilizers, tires, vehicle exhaust
<b>Mercury</b>	Paint, power plant emissions, thermometers
<b>Pesticides</b>	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 replacing 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 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 how contaminants affect development.



## Where Can I Get More Information?

- NC Community Garden Partners: <http://www.nccgp.org/>  
A broad network of partner gardens in North Carolina with a rich library of gardening resources
- NC State Extension: <https://www.ces.ncsu.edu/contact-us/>  
Local extension offices offer assistance with everything from safe gardening practices to master gardening techniques
- Soil Testing: <https://foodsafety.ces.ncsu.edu/foodsafety-soil-testing/>  
The NC Department of Agriculture provides free testing services for nutrients and pH to farmers and gardeners at no charge. Soil testing for contaminants is available through other labs for ~\$30-\$60 per sample, per contaminant (contact [superfund@duke.edu](mailto:superfund@duke.edu) for a list of labs)
- ATSDR TOXFAQs: <https://www.atsdr.cdc.gov/toxfaqs/Index.asp>  
A 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
- NC State Extension - Community Gardens: <https://nccommunitygardens.ces.ncsu.edu>

**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.