

# LEAD in the garden

**Lead** is a metal that can be found naturally in the environment, but also exists at higher levels due to human activity. Lead is still mined, but in the U.S., most lead is recovered from lead acid batteries. Paint and gasoline no longer contain lead, but these past uses are major sources in urban settings.

## Summary for Gardeners

- » Garden-related lead exposure is generally low and there are simple steps you can take to limit exposure.
- » Unless you have unusually high levels of lead in your soil, most of your lead exposure likely comes from non-garden sources like lead paint and drinking water.
- » No amount of lead exposure is considered safe, but it is important to remember that there are many health benefits to home and community gardening.

## Sources of lead exposure

**Lead** exposure can occur in the garden, but non-garden sources including lead paint and drinking water are likely bigger concerns. Still, urban soils in particular may contain hotspots of lead contamination.

Once lead is in the environment, we can be exposed in a few different ways (see exposure section to the right). Below are some of the main sources that release lead into the environment.



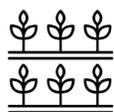
**housing** Houses built before 1978, especially those built before 1960, may contain lead-based paint. When paint weathers, particles of lead end up in house dust. Outdoor paint and home demolition can contaminate nearby soils.



**drinking water** Some metal pipes may contain lead solder. Under certain conditions, this lead can enter drinking water. Older cities with aging infrastructure are more likely to have issues with lead in drinking water.



**traffic** Past car emissions from busy roads may mean higher lead levels in undisturbed soil nearby. In 1976, leaded-gasoline began to be phased out.



**agriculture** Up until the 1960s, some pesticides used in orchards, vineyards, and gardens contained lead.

## Exposure to lead in the garden

**How might I be exposed?** Gardeners and children can be exposed to lead by eating contaminated soil particles or produce, and by handling or breathing in contaminated soil particles.

**Are my garden plants safe to eat?** In general, plants do not take up much lead from contaminated soil, so washed produce is probably not a major source of exposure. One study found that herbs tends to have the highest lead levels, followed by root vegetables, leafy greens, and finally fruits.

**Should I be worried?** Garden-related lead is likely a small portion of a person's overall lead exposure. However, reducing or limiting exposure to lead in the garden is still important, especially for children.

## Limit children's exposure

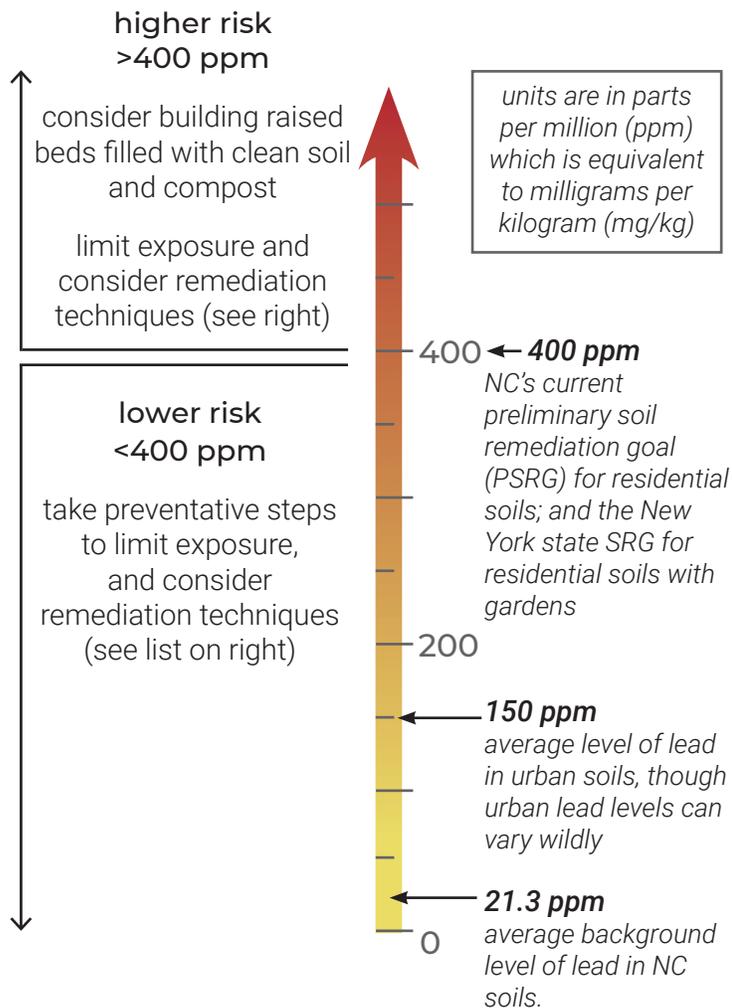
- Small doses matter. Children breathe, eat, and drink more relative to their size than adults
- Their bodies and brains are still developing
- Children spend more time on the ground and often put things (like dirt) into their mouths
- They have more skin surface area than adults, so skin exposure also matters



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## Making sense of regulatory standards

There is no accepted safe level of lead exposure. There are standards for soil lead levels in residential and play areas, but no specific limits for garden soils. The guidelines below can help you contextualize the lead levels in your garden soil.



## Health impacts of lead

Children are most at risk from lead exposure because it is a developmental neurotoxin and it can harm developing brains. Lead exposure is linked to many health problems such as impacts on learning and behavior, lower IQ, hyperactivity, slowed growth, and anemia. At high levels, lead can damage the heart and kidneys, and may cause miscarriages.

Our bodies use lead in the same way they use calcium, so it tends to be stored in bones and teeth. This stored lead may be released later in life, causing secondary lead exposure. Lead can also be released during pregnancy, where it can expose the fetus.

### Reduce lead exposure in the garden

- Adding compost or other organic matter from a contaminant-free source may help limit lead uptake by plants. Check the [NC Composting Council](#) website to find STA or OMRI certified compost
- Aim for soil pH between 5.0 and 7.5 to reduce bioavailable lead (the form of lead absorbed by the body) in soil
- To reduce lead particles in air from dust, cover bare soil with mulch and keep the soil moist
- Thoroughly wash and/or peel produce grown in lead-contaminated soil
- If your soil lead levels are high, consider installing raised garden beds and replacing the top 1-2 inches of soil each year with compost
- Conduct a soil safety training for all garden users on exposure reduction strategies
- Visit our website below for our factsheet on [10 Healthy Garden Habits](#)

## Testing resources



How to test your soil and interpret the results: <https://sites.nicholas.duke.edu/superfundcec/gardens/soil-testing/>



Well water testing for lead: <https://epi.dph.ncdhhs.gov/oe/wellwater/howtotest.html>



Still have questions about lead soil testing? Email us at [superfund@duke.edu](mailto:superfund@duke.edu)

**For more information visit:**

<https://sites.nicholas.duke.edu/superfundcec/gardens/>