HEALTHY GARDENS

FOR HOMES AND COMMUNITIES

How to have lead-safe soil for vegetable and herb gardens

In many cities, more than half of all food gardens have high lead levels in soil that can be unsafe for gardeners and families who eat the produce. Lead builds up in vegetables and herbs. It is also a risk to children who help in the garden, where lead can stick to their hands and end up in their mouths. It can harm a child's developing brain and it increases lifetime cancer risk. Lead is higher in garden soil in urban areas, near roads, and by older homes that have lead paint. But even in rural areas, lead can be naturally present at high levels. Follow these healthy gardening tips for lead-safe harvests.

Healthy Babies Bright Futures

YOUR GARDEN

Test Your Soil for Lead

Test your garden soil at a qualified soil testing laboratory—call your state university's Cooperative Extension Service for recommendations, or check their website for a list of labs. After you've tested, check the action table below to learn how you can protect children from the lead in your garden's soil and produce. The actions are based on a scientific analysis of children's IQ loss from exposure to lead in soil, and also consider normal background lead levels in U.S. soils.

Lead in soil test result	What to do	Children's safety
SERIOUS Above 400 ppm **SIGNIFICANT** 100–400 ppm	Lead in your soil is too high to be safe for growing food. Replace your garden with containers and raised beds filled with low-lead soil.	Keep children away from this soil until you've covered it with a child-safe surface like grass or mulch. A soil cap (2 inches or more) under grass or mulch gives even more protection.
MODERATE 31–100 ppm	Lead in your soil is too high to be safe for growing some kinds of crops. Avoid crops that build up high lead levels—herbs, leafy greens, and root vegetables like potatoes, radishes, and carrots. Stick to fruiting crops like tomatoes, squash, eggplant, corn and beans instead. They don't accumulate as much lead. You could also grow your crops in containers and raised beds filled with low-lead soil, instead of continuing to use your current garden.	Your soil has enough lead to be a risk for children who play in it. Daily play isn't safe. Soil can stick to children's hands and end up in their mouths. Children helping you garden should use gloves and wash up afterwards.
LOW 14–31 ppm **VERY LOW** Less than 14 ppm or not detected	Your lead levels are low and safe for growing food.	Children can help you garden, but should use gloves and wash up afterwards. Even small amounts of soil (and lead) on hands and skin is a risk when it ends up in a child's mouth.

Source: HBBF analysis of U.S. soil background levels, government/agency action levels, and IQ loss for children exposed to lead in garden soil. ppm = parts per million.

ALL GARDENS

Keep your garden safe from toxic lead

- If your soil lead levels are high, use containers for gardening, or build raised beds by covering your garden soil with landscape fabric, building a wooden frame, and then filling it with at least 8 inches of clean topsoil (low in lead) and compost. Avoid using treated pine wood, which can leach chemicals into soil.
- Locate your gardens away from roads and older homes (pre-1978) with painted exteriors. Soil lead levels are often high in these areas.
- You'll also want to place your garden away from soil near old (or removed) wood decks and fences. Old treated pine wood (pre-2004) was soaked in arsenic pesticides that leached into soil. The arsenic remains in soil for many years, making those areas unsafe for gardening.
- Add organic matter such as compost, leaf mold, or grass clippings to your garden. Add phosphorus to the soil as recommended by a soil test. These additives help keep lead bound to the soil and out of your crops.

Keep garden soil out of your house

- Have family members leave outdoor shoes at the door, to avoid tracking lead-contaminated dirt through the home.
- Rinse and launder gardening clothing right away.

Wash soil off of your crops.

- Wash crops with an outside hose to avoid bringing soil into the home.
- Wash vegetables before you cook and eat them, especially root crops, herbs, and leafy greens, which tend to collect soil. Take off the outer wrapper leaves of cabbage.

REFERENCES

Methods and a list of scientific sources underlying the health-based soil exposure levels shown in this safe gardening guide are described in Healthy Babies Bright Futures (HBBF) 2018. Empowering Families to Reduce Children's Lead Exposures. A Summary of Vida's Approach to Lead Poisoning Prevention and its Application of Protective, Health-Based Limits of Exposure.