

ARSENIC in the garden

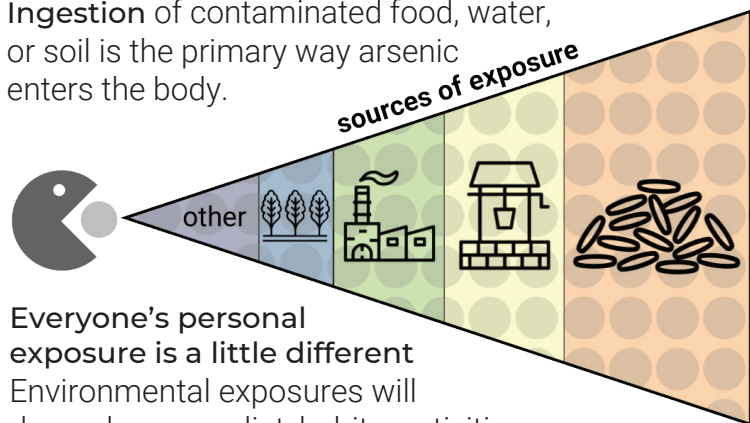
Arsenic is a heavy metal which has both natural and human-related sources. Some regions of North Carolina may have naturally high levels of arsenic in soils or well water. Other sources of arsenic include industrial manufacturing, historical pesticide use, mining, and coal-fired power plants.

Summary for Gardeners

- » Garden-related arsenic exposure is generally low. To limit exposure, rinse produce before consuming, remove any chromated copper arsenate (CCA) treated wood from your garden, and avoid using soil amendments from large-scale poultry farms.
- » Unless you have unusually high levels of arsenic in your soils, the majority of your arsenic exposure likely comes from non-garden sources like store-bought foods.





Sources of arsenic exposure

Ingestion of contaminated food, water, or soil is the primary way arsenic enters the body.



Everyone's personal exposure is a little different

Environmental exposures will depend on your diet, habits, activities, lifestyle, and many other factors. Research tells us that, in general, purchased foods and well water likely make up the biggest portion of a person's total arsenic exposure, followed by arsenic from nearby industry and finally sources in the garden.

-  **purchased foods** Store-bought rice, cereals, and fruit juices may contain higher levels of arsenic
-  **well water** In some areas, there may be high levels of naturally-occurring arsenic in drinking or irrigation water from wells
-  **nearby industry** Past or current industrial activities can release arsenic into air, water, and soil
-  **in-garden sources** Arsenic in soils or garden produce is likely a minor source of a person's total arsenic exposure

Exposure to arsenic in the garden

How am I exposed? Gardeners and children can be exposed to arsenic by ingesting soil particles, eating vegetables grown in contaminated soil, handling contaminated soil, touching CCA treated wood, or breathing in contaminated soil particles.

Are my garden plants safe to eat? In general, very small amounts of arsenic move from the soil into most fruits and seeds (e.g. tomato, pepper, squash). Rice, however, is the exception and is known to take up higher amounts of arsenic.

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

Limit children's exposure

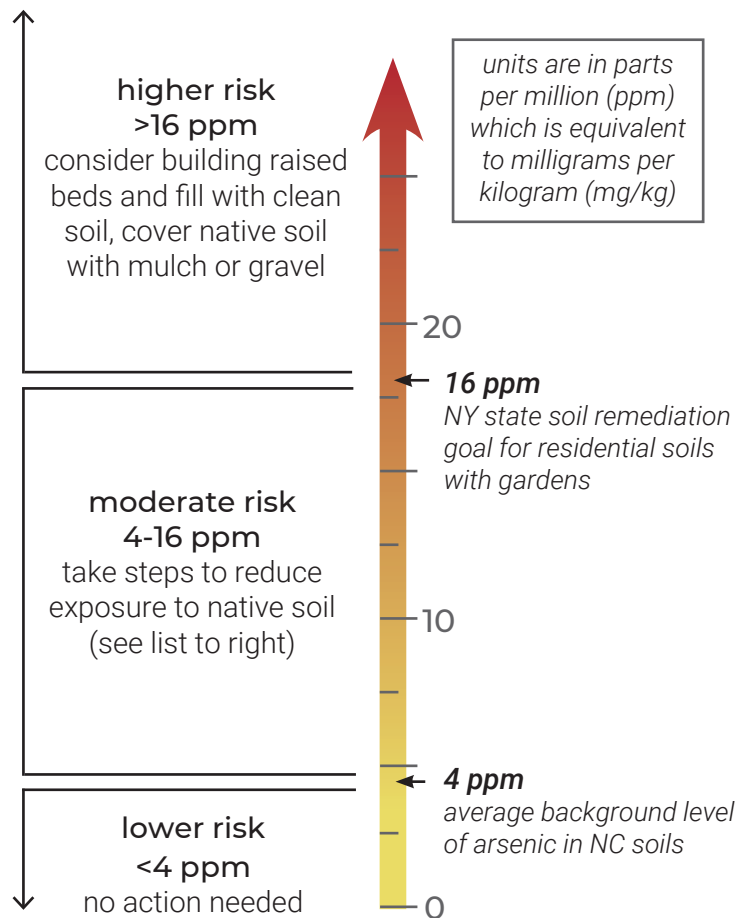
- Small doses matter. Children breathe, eat, and drink more relative to their size than adults
- Their bodies and brains are still developing
- Children spend more time on the ground and often put things (like dirt) into their mouths
- They have more skin surface area than adults, so skin exposure also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



ARSENIC in the garden

Making sense of regulatory standards

No official standards have been established in North Carolina for acceptable levels of arsenic in garden soils. The guidelines below can help you determine whether arsenic levels in your garden are above or below the average levels.



Testing resources



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



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



Still have questions about arsenic soil testing? Email us at superfund@duke.edu

Health impacts of arsenic

There is no official “safe” level of arsenic exposure from soil or food for the general population. Increasing your exposure to arsenic can incrementally increase your risk of adverse health effects. However, the increased risk due to exposure to arsenic in garden soils is likely to be very small compared to other sources of exposure.

Higher levels of exposure to arsenic are associated with several types of skin lesions and cancers as well as impacts on nervous system, respiratory, and heart health. Exposure in early life has been associated with altered brain development and increased risk of lung disease later in life.

Reduce arsenic exposure in the garden

- If applicable, test well water sources for arsenic
- Remove any CCA treated wood from the garden and choose untreated woods like cedar, black cherry, or oak or other non-leaching materials
- Add compost or other organic matter from a contaminant-free source. Check the [NC Composting Council](#) website to find STA or OMRI certified compost
- Avoid using fertilizer (i.e. poultry litter) from commercial poultry farms. Arsenic is often used as a growth additive in poultry feed
- Aim for a neutral soil pH (around 7) to limit the bioavailability of arsenic in the soil
- Conduct a soil safety training to teach exposure reduction strategies to all garden users
- Visit our website below for our factsheet on [10 Healthy Garden Habits](#)

For more information visit:

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

