

MERCURY in the garden

Mercury is a metal that has both natural and man-made sources. Depending on the type of mercury, it can be found as a solid, liquid, or gas. Mercury is a byproduct of coal burning and mining, and was historically used in thermometers, barometers, and some electronics.

Summary for Gardeners

- » Plants do not readily take up mercury from the soil, so you can reduce exposure by controlling dust and limiting the soil children ingest.
- » Mercury comes in different forms, but the most toxic form is not usually found in soils.
- » Children and pregnant women are at greatest from exposure, but mercury in garden soil is much less of a concern than other sources like contaminated fish.

Sources of mercury exposure

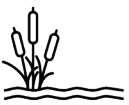
Sources outside the garden are typically greater health risks. Mercury is usually found at very low levels in soils, but hotspots from man-made sources may also exist. Below are some of the main sources of mercury exposure, both in and outside the garden.



nearby industry Coal power plants, mining operations, and other industries can release the metal into air, water, and soil.



fish Highly toxic methylmercury can build up in the food chain, as one fish eats a smaller fish.



aquatic environments Peaty and waterlogged soils have the highest concentration of naturally occurring mercury.

Mercury comes in different forms

Methylmercury

- » not usually in soils
- » exposure from eating some types of fish
- » harmful at very low levels

Total Mercury

Metallic

- » not usually in soils
- » "pure" form
- » previously used in thermometers, barometers, etc.

Inorganic

- » low levels common in soils
- » not as harmful, but still has health effects

Exposure to mercury in the garden

How am I exposed? You can be exposed by eating or breathing contaminated soil particles, or by eating contaminated garden produce.

Are my garden plants safe to eat? Soils tend to contain inorganic mercury. Plants (and people) are not good at absorbing mercury in this form. Garden produce is not a major source of mercury exposure.

Should I be worried? It is important to remember that there are many health benefits associated with gardening. Mercury exposure is a serious concern in mining communities and among communities that eat certain types of fish. However, garden exposure at high levels is uncommon. Even so, limiting exposure, especially for children, is always a good idea.

Limit children's exposure

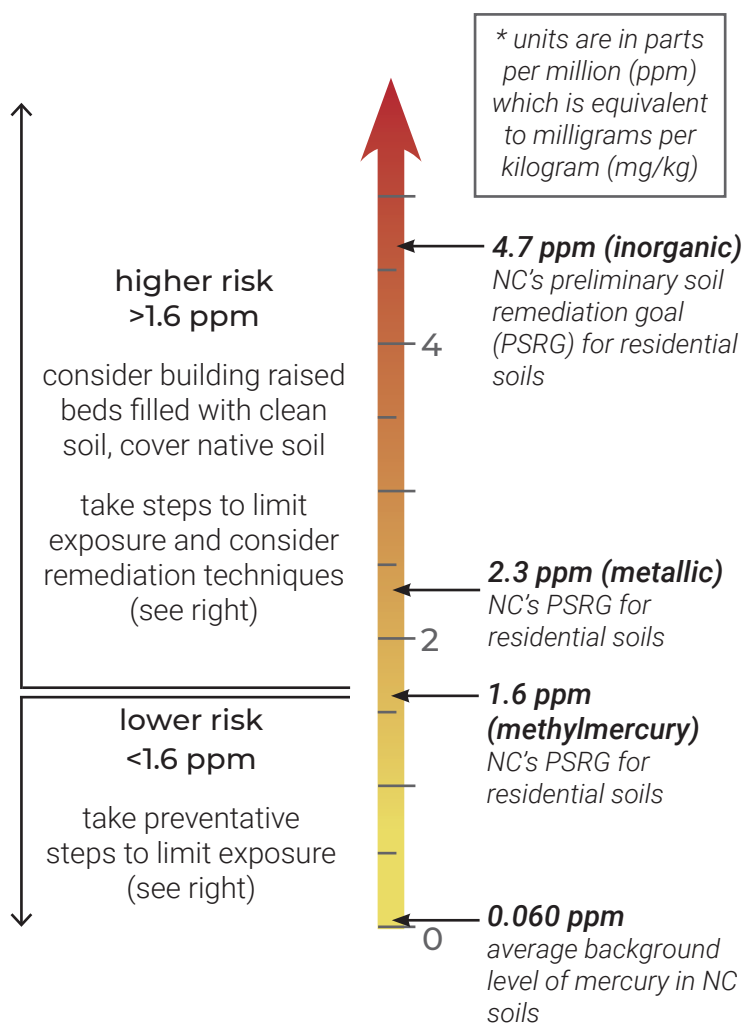
- Small doses matter. Children breathe, eat, and drink more relative to their size than adults
- Their bodies and brains are still developing
- Children spend more time on the ground and often put things (like dirt) into their mouths
- They have more skin surface area than adults, so skin exposure also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



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Making sense of regulatory standards

No official standards have been established in North Carolina for acceptable levels of mercury *in garden soils*. For remediating residential soil, NC uses EPA's guidelines for different forms of mercury. New York State's guideline (0.81 ppm*), considers exposures like gardening and assumes mercury is in its most toxic form, so it is a conservative value that represents an abundance of caution.



Health impacts of mercury

Exposure to inorganic mercury at high levels can damage kidneys, stomach, and intestines. Impacts to the nervous system can cause mood swings, memory loss, and behavioral changes. Skin exposure can cause rashes and dermatitis.

Children and pregnant women are at greatest risk from mercury exposure. The developing fetus is vulnerable to the toxic effects of maternal mercury exposure.

Methylmercury is particularly toxic and can accumulate up the food chain, but it is not usually found in garden soils.

Reduce mercury exposure in the garden

- Uptake of mercury by plants is low, so focus on controlling dust and limiting soil ingestion
- Remove boots or shoes after gardening to reduce the amount of contaminated soil you track into your home
- To reduce mercury particles in air from dust, cover bare soil with mulch and keep the soil moist
- Flooded soils may help convert mercury to its more toxic form, but this can take many months
- Adding compost or other organic matter from a contaminant-free source may help dilute mercury concentration in soil. Check the [NC Composting Council](#) website to find STA or OMRI certified 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/>



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

For more information visit:

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

