

Gardening and Soil Contaminants

Public Health - Factsheet

Is the soil in my community suitable for gardening?

Soil in some communities or neighbourhoods can contain contaminants. Contaminants may be present in the soil naturally. However, most are present because of industrial activities, traffic or products that were used around the home in the past (such as lead paint).

Soil contaminants can be successfully managed. This fact sheet and links provide advice on how to assess your garden site for potential contaminants, ways to manage soil contamination and general gardening safety tips.

What are the health risks of exposure to contaminants?

Growing food at home or in your community is a great way to save money, improve nutrition, and practice environmental stewardship.

Metals and other contaminants can affect a person's health, depending on the amount of exposure and the length of time of exposure.

The health risks associated with backyard gardening, even in contaminated soil, are low to very low, if precautions are taken, unless soil contamination levels are extremely elevated.

Lead is a common contaminant in soil. Lead levels in the environment were much higher in the past. However, recent information indicates that health effects from lead can occur at much lower levels than was previously known. Children and unborn children are particularly sensitive to lead exposure. Consuming lead can reduce intellectual and behavioural development in children.

Arsenic, cadmium and polycyclic aromatic hydrocarbons (PAHs) are relatively common soil contaminants. Ongoing exposure to these contaminants may create a long-term increased risk of developing cancer and other chronic health effects.

Garden soils tend to have lower levels of contaminants than other soil around the home, as homeowners often add new clean soil and compost to improve the health of the garden.

How can I be exposed to contaminants in soil from my garden?

Directly consuming the soil presents the greatest risk. For example, children may directly eat soil, or people may eat garden produce without first washing it to remove soil and dust.

Research has shown there is a very small risk of exposure to contaminants from eating vegetables grown in contaminated soil, if precautions are followed.

For garden produce, most of the risk from contaminated soil is due to the dust deposits on the surface of leafy vegetables or on the surface of tuber vegetables (such as carrots and potatoes), rather than from plant uptake of contaminants from the soil.

However, it is possible for plants to take up contaminants present in the soil. Contaminant uptake by plants is more likely if the soil is acidic and low in organic matter, where concentrations of lead, arsenic and cadmium are high. Certain types of plants may take up more contaminants than other types. Studies have shown that lead does not readily accumulate in the fruiting parts of vegetable and fruit crops (such as corn, beans, squash, tomatoes, strawberries and apples). Higher concentrations are more likely to be found in leafy vegetables (such as lettuce) and on the surface of root crops (such as carrots) because they grow underground.

What is the risk of exposure to contaminants in my garden?

The following risk factors increase the likelihood of contaminated soil in your garden:

- Homes built before 1990 could have lead in the soil due to lead paint near fences and the house. The older the home, the greater the risk.
- Homes built along older streets with heavy traffic may have lead in the soil due to previous use of leaded gasoline.
- Homes built near industries may have contaminants in soil.

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- Previous use of the land for your home -- which includes commercial use, infill of the land with imported soil, use as a former landfill site, former industrial site, or former print shop, autobody shop, or rail line.
- The soil on your property has odours, evidence of dumping of garbage, or soil staining.

If you have any of the risk factors listed above:

- Do not plant your vegetable garden near your fence or your house if you have an older home.
- Consider using a new raised bed garden with clean soil and a lining over the old soil. For more information on raised beds and other best practices for gardening, please see the U.S. Environmental Protection Agency's Growing Gardens in Urban Soils fact sheet: www.epa.gov/sites/production/files/2014-03/documents/urban_gardening_fina_fact_sheet.pdf.
- Consider growing vegetables and fruits that are picked from a plant (such as corn, beans, squash, tomatoes, strawberries and apples), as they take up less contaminants than leafy or tuber vegetables.
- If your home was built before 1990, be careful when you do outdoor renovations. Cover the ground where you are working to prevent lead paint from getting into the soil. Use water to keep the paint you are disturbing wet, and do not use power tools to remove paint. This will prevent lead paint dust from getting into the air and soil. For more information, please see **Health Canada: Lead-based Paint**.
- Consider testing your soil.
- If the pH in your soil is low, adding limestone may reduce the likelihood of uptake of metals by the plant.

Tips for All Gardeners

- Wash all of your produce before eating it.
- Add fresh soil, compost or mulch to your garden periodically.
- Peel root vegetables and remove outer leaves of leafy plants.

- Wear gloves and wash your hands after working in the garden.
- Wash garden clothes separately and leave garden shoes outside.
- Avoid consuming soil (this is especially important for small children).
- Do not use treated wood or creosote railway ties for gardens.
- Assure that the new soil that you add to your garden is approved for use in gardens.

Should I test my garden soil?

You cannot know for sure if there are contaminants in your soil without having it tested by a laboratory. Determining if there are contaminants in soils is expensive and is not needed on a routine basis. It's likely more cost-effective to install a raised bed garden if you are concerned about the soil. However, if you suspect high levels in the soil that you plan to use for gardening, it may be helpful to have the soil tested. In some cases, it may be prudent to avoid growing edible plants in soils with high contaminant concentrations. For more information on soil assessments, please see the Vancouver Coastal Health fact sheet:

<http://vancouver.ca/files/cov/guide-to-reduce-health-risks-urban-farming.pdf>

For information on where your soil can be tested is available at:

www.manitoba.ca/agriculture/crops/soil-fertility/soil-testing-in-manitoba.html.

For more information on lead, arsenic, cadmium and PAHs, please see the following fact sheets:

- Lead
- Arsenic
- Cadmium
- Public Health Statement for Polycyclic Aromatic Hydrocarbons (PAHs)