

Concentrations of Polycyclic Aromatic Hydrocarbons in New York City Community Garden Soils: Potential Sources and Influential Factors

A [*Healthy Soils, Healthy Communities*](#) study of New York City community garden soils was in the journal [*Environmental Toxicology & Chemistry*](#). The study tested 69 soil samples from 20 gardens for polycyclic aromatic hydrocarbons (PAHs), a family of chemicals that can be present in soil through spills of carbon-based fuels, breakdown of asphalt and other materials, or the incomplete burning of carbon-based materials such as gasoline, coal, oil, natural gas, wood, and garbage. PAHs can be a concern because long term exposure to large amounts of some PAHs has been associated with health effects, including cancer. Garden soil samples were collected in 2010, and the *Healthy Soils* team shared test results, interpretation, and advice on healthy gardening practices with participating gardeners when the laboratory testing was completed in 2011.

Soil samples were collected from garden beds and from non-growing areas such as paths between garden beds. Some of the garden beds had visible material or characteristics that could have contributed PAHs to the soil, such as pieces of asphalt in the soil, creosote-treated timbers around the beds, or a busy road nearby. Other garden beds were free of apparent sources of PAHs.

Overall, the study found that levels of PAHs in the garden soil samples were comparable to those found in soils from other large cities in the US and worldwide.

Soils from garden beds that had no visible evidence of PAH sources had lower PAH levels than soils from non-growing areas like paths between beds. Beds with no visible evidence of PAH sources had a lower median level of PAHs than beds with visible evidence, but the difference was not statistically significant. Levels of PAHs in beds from gardens known to have had soil amendments (clean soil or compost) added were lower than levels in beds from other gardens.

PAH levels were significantly associated with black carbon levels in the soil samples. (Black carbon is a major component of soot and is a persistent form of carbon that, like PAHs, is the result of incomplete burning of carbon based materials. PAHs in the environment also tend to stick to black carbon.) Soil PAH levels were also significantly associated with levels of PAHs in air near the gardens (as [estimated by the US Environmental Protection Agency](#)). This and other evidence presented in the *Healthy Soils* study suggest that most of the PAHs in NYC community garden soil come from the deposition of airborne PAHs from burned fuel, not from releases of unburned fuel (e.g., spills).

[Emissions of many pollutants from burning of fuels in New York State](#) have been going down in recent years due to better environmental regulation, which likely is resulting in decreasing deposition of PAHs and other pollutants to soil. In addition, our findings suggested that general gardening practices may also reduce soil PAH levels. Gardeners can also reduce possible health risks and maximize the many benefits of gardening by following these [healthy gardening practices](#).