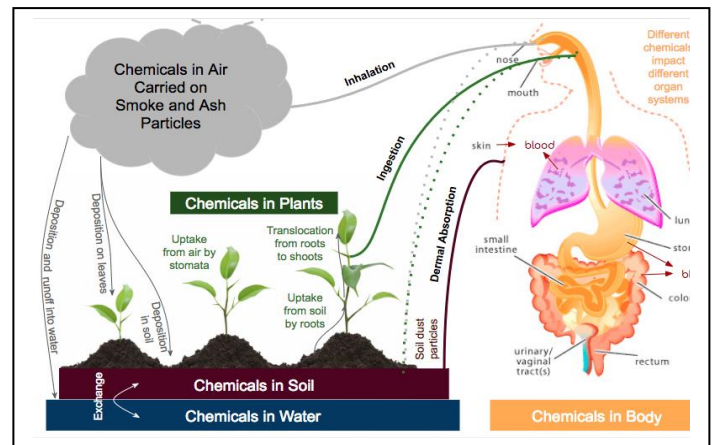


Fires can cause harm and property damage, but can also produce smoke carrying multiple contaminants, increasing exposure to human and environmental health risks by affecting your soil quality and the safety of foods you grow. When possible, know your site history and baseline soil quality before a fire event takes place. After a fire, consuming produce grown where smoke was in the air could be unsafe due to unknown contaminants, if present. One only knows if contaminants were deposited on soils or produce by having samples tested by a lab. This fact sheet shares practices to reduce health risks when growing food after a fire.

What are the human and environmental health risks from fires near local farms and gardens?

Smoke created during fires can carry multiple possible unknown contaminants depending on what built environment and natural materials burned. Based on local land uses where fires occurred (e.g. industrial, residential, or rural farming or forested areas), smoke may contain varying amounts of chemicals including:

- Hydrocarbons such as petroleum products from roads, car garages, or auto industries;
- Heavy metals like lead, cadmium, nickel and arsenic in metals, old building paint and piping, electronics, batteries and many industrial manufacturing processes;
- Other chemicals in farm or landscape settings, machinery and/or equipment;
- And hazardous chemicals used or stored on industrial sites and buildings in the fire area.



*Environmental Exposure Pathways*

## During or After a Fire

### SUGGESTED BEST PRACTICES FOR LOCAL FOOD GROWERS

**Protect Your Lungs:** During a wildfire, protect your health by avoiding smoke inhalation. Protect your lungs by staying indoors whenever possible and wearing a respirator mask when outdoors to minimize health risks. An N95 respirator is the minimum protection recommended, while a P100 respirator will provide additional protection from petroleum-based chemicals and smaller particles. Use of surgical masks are insufficient for lung protection against smoke inhalation during fires.

**Wash Your Produce:** Wash your hands before eating and handling food. Observe your produce noting signs of particle deposits, and whether your plants appear healthy. Wash produce well by running fruits and vegetables under running water before storing, cooking, canning or eating them. Soak your produce in a 10% white vinegar solution by volume, which can lift soil particles off produce such as deeply veined leafy green vegetables like kale, swiss chard, savoy cabbage, and hairy fruits like peaches. Remove the outer leaves of lettuce or leafy greens and peel root crops before eating.

**Wash Your Hands & Clothes:** Wash your hands and face with soap and water after working in a farm or garden that may have smoke-deposited particles. Reduce the chances of bringing soil particles that may carry contaminants into your home and onto rugs where kids and pets play or sleep by removing your boots and changing your clothes immediately when returning home. Keep the outdoors...outdoors – use a boot brush to clean your shoes, and observe and minimize dust at home, regularly cleaning areas where dust accumulates. Wash gardening clothes immediately.

**Test Your Soil, Consider Whether You Need to Test Your Produce:** After a wildfire, you can check for soil contamination by collecting soil samples from your garden and sending them to a lab. Before taking samples, draw a map of your food growing area and label it with the spots where you took your samples from. Mapping your food growing area and soil sample spots is a good idea so you can correlate your test results, and identify spots of concern in case you need to do more testing, and guess what? Mapping saves time, money, and help you understand on the ground conditions!

Search UC Cooperative Extension County Master Gardener Program web pages for regional analytical soil labs lists; simply search 'UCCE + the County's Name + Master Gardener Program.' Ask your lab for a heavy metals panel analysis that includes lead, cadmium, arsenic, nickel and mercury. Heavy metals tests typically cost under \$100 per sample. Tests for dioxin and other organic chemicals that may be present in smoke can be hundreds of dollars per sample. If heavy metals are present in your soils, there is a greater chance other contaminants may also be present.

Contaminants detected in post-fire soil testing may have been present there before the fire. You will not know if contaminants are present as a result of fire smoke deposits on your produce or soils unless you have had your soils tested prior to a local fire, or unless you have your produce tested after a nearby fire. See University of California ANR's guides on Soils in Urban Agriculture: Testing, Remediation, and Best Management Practices for more information. Search for ANR Publication 8552 [www.anrcatalog.ucanr.edu](http://www.anrcatalog.ucanr.edu). Also see: <http://ucanr.edu/sites/UrbanAg/> on Food Safety.

**Contain Your Soil:** Build up using raised bed planter boxes when low contamination-soils are present. Mulch soils beds with straw and use sub-surface irrigation (such as drip-irrigation) to prevent the up-splashing of soil particles onto the under-sides of leaves, especially leafy green vegetables or other plants' parts. A landscape fabric or weed cloth can also be used as a barrier between local and imported soils. Avoid ingesting soil, and prevent soil from getting kicked up in dust.

**Amend Your Soil:** Regularly amend soils with compost and add "clean" soil to your food growing-beds to dilute contaminants. Some research suggests that adding compost to soils increases soil microbial and fungal populations, which may help break down organic chemicals (like dioxins) in soils, and would be appropriate for low-level contamination, while composts high in phosphorous may help bind lead and cadmium in soil. Wear a face mask and minimize airborne dust whenever turning soils.

**Eat Fresh Produce:** Increasing produce consumption promotes healthy nutritional health and resilience to stress and chemical exposures, plus growing food can also be therapeutic!

Produce Safety After Urban Wildfire  
UC Cooperative Extension of Sonoma County  
[ucanr.edu/produceafterfire](http://ucanr.edu/produceafterfire)

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