URBAN SOIL SAMPLING & TESTING PROTOCOL

A step-by-step guide for community gardens, urban farms, and small-scale growers

Learn how to plan a sampling area, collect representative soil samples, work with a qualified laboratory, and understand heavy-metal results before deciding how a site should be used.

Garden / Farm Name _____	**Site Address / Location** _____
Prepared By _____	**Date Sampled** _____
Primary Contact _____	**Laboratory / Sample ID** _____

Provided by Strategic Alignment Network, LLC

Urban agriculture education • Soil safety awareness • Technical assistance

SAFETY FIRST: This guide supports sampling and result review, but it cannot determine whether a site is safe for food production. Heavy-metal risk depends on the specific contaminant, concentration, exposure pathway, crop and site conditions, and applicable local guidance. Use a qualified laboratory and consult local extension, environmental health, or environmental professionals when results are elevated or unclear.

1. Purpose and Planning

Urban soils can vary significantly over short distances because of past land uses, imported fill, traffic, building materials, industry, pesticide history, and other sources. Soil testing can help identify potential concerns, but a single sample does not represent every part of a property. Design the sampling plan around how the site will be used and any known or suspected sources of contamination.

Before sampling

• Define the purpose: food production, raised-bed placement, play areas, landscaping, or a preliminary site screen.

• Sketch the site and mark garden beds, pathways, former structures, burn areas, painted buildings, roads, dumping spots, and other distinct features.

• Separate areas with different histories or uses. Do not combine soil from a suspected hot spot with soil from a general garden area.

• Contact the laboratory before collecting samples. Ask for the recommended sample depth, sample quantity, containers, handling instructions, requested analytes, reporting units, turnaround time, and fees.

• For decisions about edible crops, ask the laboratory or a qualified professional whether testing for lead, arsenic, cadmium, and other site-specific metals is appropriate.

2. Equipment and Supplies

Item	Purpose / Notes
Clean stainless-steel trowel, soil probe, or auger	Use clean tools appropriate for the soil and requested depth. Avoid galvanized or brass tools if metal contamination is being tested unless the lab approves them.
Clean plastic bucket	Use a separate clean bucket for each sampling area; never use a bucket that held chemicals or other materials.
Laboratory-provided bags / containers	Use the container and labeling method specified by the lab. Do not substitute containers without asking.
Disposable gloves, marker, labels	Change gloves between areas when appropriate; label samples clearly and legibly.
Site sketch, notebook, phone / camera	Record locations, sample depth, date, recent site conditions, and observations.

3. Choose and Mark Sampling Areas

• Create separate sampling zones for areas with different land-use histories, soil appearance, fill material, or planned uses.

• For a relatively uniform garden zone, a composite sample may be appropriate if the lab or advisor recommends it. A composite combines several small subsamples from the same zone.

• Collect suspected hot spots separately. Examples include old building drip lines, areas near painted structures, ash or burn piles, former industrial or dumping areas, and locations with unusual fill.

• Avoid sampling directly from compost piles, fertilizer bands, standing water, or recently amended spots unless the purpose is specifically to test that material or location.

Important: If there is reason to suspect substantial contamination, seek professional guidance before disturbing soil. Sampling strategy may need to be designed by an environmental professional.

4. Step-by-Step Soil Sampling

Always follow the laboratory's instructions if they differ from this general guide. Depth and collection methods depend on the decision being made and the lab's analytical method.

Step 1 — Label before collecting

Assign a unique sample ID to each sampling zone (for example, GARDEN-A-SURFACE). Record the location, intended use, date, collector, and planned depth on the label and field sheet.

Step 2 — Remove surface debris

Move aside loose leaves, mulch, grass, and other surface material without removing the soil you intend to test. Do not include plant material unless the lab instructs you to.

Step 3 — Collect subsamples at the specified depth

For a composite sample, collect multiple small, evenly distributed subsamples across one reasonably uniform zone. A common garden screening approach is to collect roughly 5–10 subsamples from a defined area, but follow the laboratory or local extension's recommendation. Keep each sample at the same specified depth; do not mix topsoil and deeper soil unless instructed.

Step 4 — Keep zones separate

Place subsamples from the same zone in its clean bucket only if making a composite. Do not combine samples from different zones or mix a suspected hot spot into the general sample.

Step 5 — Mix and prepare the composite

If composite sampling is appropriate, gently mix the subsamples in the clean bucket and transfer the amount requested by the laboratory into its specified container. Do not add water or other materials. Ask the lab whether drying, sieving, or any other preparation should be performed by you or by the lab.

Step 6 — Label, document, and package

Check that the container label matches your field sheet. Seal and package it as directed by the lab. Keep samples protected from cross-contamination and deliver or ship them within the laboratory's recommended timeframe.

Step 7 — Clean tools between zones

Remove soil from tools and clean them between sampling zones to reduce cross-contamination. Follow the lab's guidance on cleaning methods and any required decontamination procedures.

5. Field Sampling Record

Sample ID	Location / Zone	Depth	Number of Subsamples	Date / Collector

Site observations / suspected sources / recent soil amendments:

Notes

6. Selecting a Laboratory and Tests

Choose a laboratory experienced in soil testing for the intended use. For contaminant analysis, look for a laboratory accredited or recognized for the specific analytes and methods you need. A routine fertility test may not include heavy metals.

Ask the laboratory:

• Does the test measure total concentrations or a particular extractable / bioavailable fraction?

• Which metals are included, and can lead, arsenic, cadmium, or other site-specific contaminants be added?

• What sample depth, quantity, container, preservation, and shipping method are required?

• What are the reporting units, detection limits, and quality-control procedures?

• Can the lab explain the report, and should a qualified environmental professional review results above screening values?

7. Understanding Heavy-Metal Results

Read the laboratory report carefully. Confirm the sample ID, units, soil depth, analytical method, and whether the reported value is a total concentration or another measure. Soil concentrations are commonly reported as milligrams per kilogram (mg/kg), which is numerically equivalent to parts per million (ppm) by mass for soil.

Report element	What to check
Analyte	Which metal or contaminant was tested (for example, lead or arsenic).
Result and units	Read the numerical result and units. Do not compare numbers reported in different units without converting correctly.
Method / fraction	Understand whether the method reports total concentration or a specific extractable fraction; values from different methods may not be directly comparable.
Detection / reporting limit	A result reported as not detected does not necessarily mean zero. It means the substance was not measured above the method's stated limit.
Quality flags / notes	Check qualifiers, sample condition, laboratory comments, and any recommendations for confirmation or additional testing.

Screening values are not universal safety cutoffs

Interpretation depends on the contaminant, land use, exposure route, local or state guidance, and applicable regulatory framework. A value used for residential soil screening may not be identical to a value used for agricultural land or another setting. Do not treat one number as a universal threshold for whether produce is safe to eat.

Lead and arsenic deserve particular care. Lead can be present in urban soils from historic paint, gasoline, industry, and other sources. Arsenic may be naturally occurring or related to past site uses. Plant uptake varies by contaminant, crop, soil chemistry, and growing conditions; produce may also be contaminated by soil or dust on its surface. Soil results alone do not fully predict exposure.

8. What to Do When Results Are Elevated or Unclear

Do not make a final site-safety decision from this template. If results exceed applicable screening guidance, are close to a screening value, or are difficult to interpret:

• Contact the laboratory, local Cooperative Extension, public health / environmental health department, or a qualified environmental professional.

• Ask whether confirmation sampling, additional samples, or a more detailed site assessment is warranted.

• Avoid dust and soil ingestion; keep children away from potentially contaminated soil and prevent tracking soil into buildings.

• Consider interim exposure-reduction measures recommended by qualified authorities, which may include clean imported soil in properly constructed raised beds, a barrier between native soil and clean soil, ground cover on bare soil, handwashing, and washing produce thoroughly.

• Use clean soil and compost from reliable sources. Prevent mixing imported clean soil with underlying soil where contamination is a concern.

• Follow site-specific professional advice on crop selection, garden placement, remediation, and whether food production should be limited or paused.

> **Do not assume raised beds alone resolve every risk.** Raised beds need a suitable barrier and clean growing medium, and nearby contaminated dust or soil can still reach crops. Do not use a generic dilution recipe or add amendments as a substitute for expert advice on elevated heavy metals.

9. Laboratory Results Summary

Sample ID	Analyte	Result / Units	Lab Method / Notes	Follow-Up Needed

Questions for laboratory / extension / environmental professional:

Question / Recommendation	Person Contacted / Date	Next Step

10. Sampling Checklist

Task	Complete	Notes
Purpose and planned use of site defined		
Site map prepared; distinct zones and hot spots marked		
Laboratory contacted for instructions and test selection		
Correct clean tools and lab containers obtained		
Samples labeled before collection		
Depth and number of subsamples recorded		
Different zones kept separate; tools cleaned between zones		
Field sheet and site observations completed		
Samples packaged and delivered as directed by laboratory		
Results reviewed with appropriate guidance before making site-use decisions		

11. Resource and Disclaimer

For site-specific recommendations, contact your local Cooperative Extension office, state or local environmental / public health agency, the analytical laboratory, or a qualified environmental professional. Follow current laboratory instructions and applicable local guidance. Testing programs and screening values can change, so verify current recommendations before relying on them.

Educational disclaimer
This protocol is provided by Strategic Alignment Network, LLC for general education and planning. It is not a substitute for laboratory instructions, site-specific environmental assessment, medical advice, or regulatory guidance. It does not certify that soil or produce is safe. Sampling and interpretation decisions should be based on the site's history, intended use, validated laboratory results, and current advice from qualified professionals.

Strategic Alignment Network, LLC

Educating and empowering agricultural communities through practical resources, food safety education, and technical assistance.