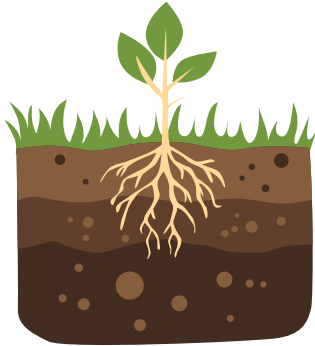


Soil Health & Sustainable Urban Agriculture

What is Soil Health?



Soil health is the ability of soil to function as a vital living ecosystem that sustains plants, animals, and humans. Components of healthy soil include: minerals, water, air, organic matter, fungi, bacteria, and other microbes.

Healthy soil supports plants and wildlife, manages water, cycles nutrients, filters pollutants, and provides a stable foundation for plant growth.

Why is Soil Health important for Urban Farming?

Soil health is the cornerstone of urban agriculture and helps build healthier, more resilient urban communities and ecosystems. Healthy urban soils help manage stormwater, reduce heat, support biodiversity, promote safer soil interactions, and mitigate climate change.

Urban Soil Challenges

Urban soils have been shaped by decades of human activity and changes to the environment. Development, construction, pollution, and past land uses can alter soil conditions, creating challenges for urban growers. Some of the most common challenges include:

-  **Contamination by heavy metals** from old paint, industrial activity, demolition, and other sources
-  **Compaction** from construction, vehicles, foot traffic, and heavy equipment
-  **Organic matter depletion** makes it harder for soil to hold water and nutrients
-  **Lack of topsoil** due to development, grading, erosion, or removal
-  **High concentrations levels of chemicals** from previous industrial, residential, or commercial uses
-  **Higher temperatures** from heat-absorbing buildings and pavement can increase soil temperatures
-  **Stormwater runoff and flooding** can cause erosion, carry pollutants, and damage crops
-  **Limited access to irrigation** can make it difficult to provide crops with consistent water, especially during hot and dry periods



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Improving & Managing Soil Health

Healthy soil is built over time by using a Soil Health Management System that combines practices to protect and improve the soil. Following these soil health principles can help build organic matter, reduce compaction, improve water movement and storage, recycle nutrients, and support life in the soil. Over time, healthier soil can help urban farms better handle drought, heavy rain, erosion, and other challenges.

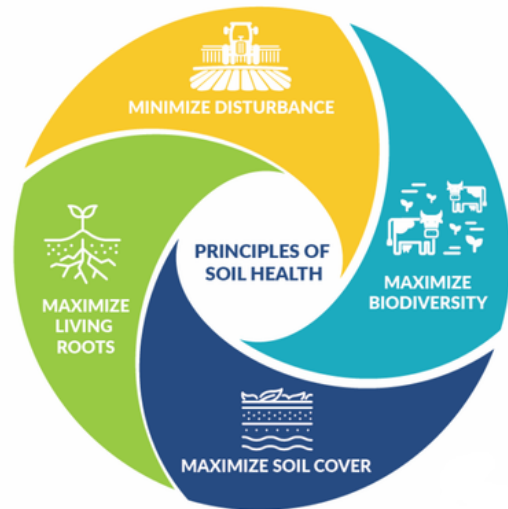
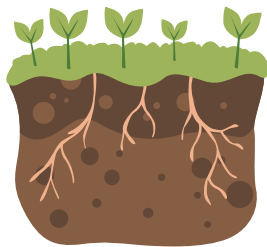


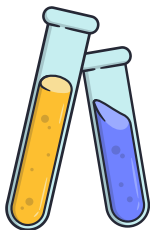
Image Credit: USDA NRCS

Components of Soil Health

PHYSICAL HEALTH



Healthy soil has good structure with space for air, water, and plant roots to move through it. Good physical structure helps soil absorb and hold water, supports root growth, and reduces runoff and erosion. Compacted soil restricts roots, reduces water infiltration, and limits the movement of air throughout the soil.



CHEMICAL HEALTH

Healthy soil has the right balance of nutrients, minerals, organic matter, and pH to support healthy plant growth. Soil testing helps growers understand nutrient levels and identify potential concerns, including salts and contaminants such as lead and other heavy metals.



BIOLOGICAL HEALTH

Healthy soil is full of life. Bacteria, fungi, insects, earthworms, plant roots, and other organisms work together to break down organic matter, cycle nutrients, build soil structure, and contribute to a functioning soil ecosystem.

Soil Health Practices for Urban Growers



1. Raised Beds

Raised beds create a controlled growing space using clean soil and compost. They are especially useful when existing soil is contaminated, compacted, poorly drained, or lacking topsoil. When possible, use soil and compost from trusted sources and add a barrier when needed.



2. Mulching

Covering bare soil with leaves, straw, wood chips, or other organic materials helps hold moisture, protect soil from extreme temperatures, prevent erosion, and reduce weeds. As mulch breaks down, it also adds organic matter to the soil.



3. Cover Crops

Cover crops keep living roots in the ground between growing seasons or when beds are not in production. They protect bare soil, reduce erosion, build organic matter, improve soil structure, and provide habitat for beneficial insects and soil life.



4. No-Till & Reduced Till

Reducing soil disturbance helps protect soil organisms, maintain soil structure, reduce erosion, and build organic matter over time. In contaminated areas, it also reduces exposure to and movement of contaminated soil.



5. Soil Carbon Amendments

Adding carbon-rich materials such as compost, aged plant material, biochar, or rabbit manure can build organic matter, improve soil structure, and help soil hold water and nutrients. Use soil testing to understand what your soil needs before adding amendments.



6. Irrigation

Consistent access to clean water is essential for healthy soil and plants. Efficient irrigation (like drip systems) delivers water to plant roots. Mulch, organic matter, and , rainwater management can also reduce water loss, keep moisture in the soil, and help plants stay healthy during hot and dry conditions.