

For agriculture engineers

Understanding Soil



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A close-up photograph of several hands of different skin tones holding small, round, red berries. The hands are arranged in a circular pattern, with the berries being the central focus. The background is dark and out of focus.

The Content

01.

What is Soil?

02.

**The Soil Profile:
Layers of Soil**

03.

Soil Types

Loamy soil

Texture and structure

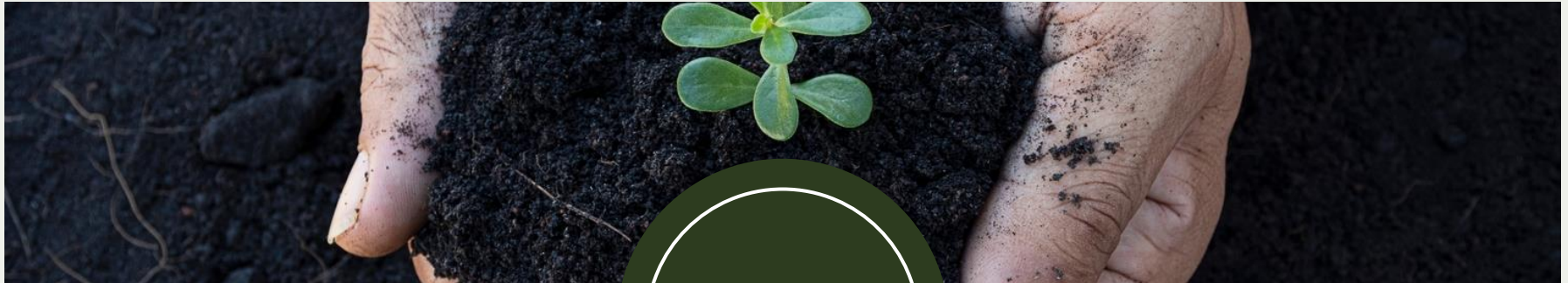
Soft, crumbly, and easy to work with. Holds shape when squeezed but breaks apart easily.

composition

40% sand (provides drainage and aeration).
40% silt (adds fertility and moisture retention).
20% clay (holds nutrients and improves structure).

color

Dark brown or black in color due to high organic matter content..



How to identify loamy soil

Visual & Texture Check

Color: Dark brown/black (indicates high organic matter).

Dry Feel: Soft, crumbly, and slightly gritty (like moist cake flour).

Wet Feel: Holds shape when squeezed but crumbles easily when poked.

Squeeze Test

Take a handful of moist soil.
Squeeze it into a ball:

Loam: Forms a loose ball that breaks apart with light pressure

Jar Test

Fill a clear jar with 1/3 soil + 2/3 water.
Shake vigorously, then let sit for 24 hours.

Check layers:

1. **Sand** (bottom): Gritty, settles first.
2. **Silt** (middle): Smooth, like flour.
3. **Clay** (top): Fine, cloudy particles.
4. **Loam** will show roughly **40% sand, 40% silt, and 20% clay**.



Properties of loamy soil

Drainage

Drains well (unlike clay) but retains enough moisture for plants (unlike sand).

Nutrient retention

Rich in organic matter



Water retention




Water infiltrates in 2–6 hours—ideal for most crops

Workability



- Easy to till and doesn't compact as easily as clay.
- Warms up quickly in spring, allowing for early planting.



Advantages of loamy Soil

-  Perfect for most plants—vegetables, fruits, flowers, and trees thrive in it.
-  Retains nutrients and water without waterlogging.
-  Good aeration for healthy root growth.
-  Requires fewer soil amendments compared to clay or sandy soils.

Disadvantages of loamy Soil

-  Rare in nature—most gardeners need to improve their soil to achieve loam.
-  Can lose structure if over-tilled or stripped of organic matter.



CLAY



LOAM



SAND



SILT