The word texture describes the roughness or smoothness of an object. Soil texture is determined by feeling the soil.

- **Soil texture** is the proportion of sand, silt, and clay in the soil.
- **Soil texture** is considered by most soil scientists to be the single most important soil property.
- **Soil texture** affects many land uses and cannot be changed without great cost and effort.

**Sand**, the largest particle of the soil, is visible to the eye. It is gritty, holds little water, and is not slick or sticky when wet. Sand particles are between 2 and 0.05 millimeters in diameter.

Medium-sized soil particles are called **silt**. Silt feels like flour or talcum powder. It holds moderate amounts of water and has a somewhat sticky feel when wet. Silt particles are between 0.05 and 0.002 millimeters in diameter.

The smallest particles of soil are called **clay**. Most individual clay particles can only be seen with a powerful microscope. Clay feels sticky when wet, and hard when dry. Clay is more chemically active than sand and silt. Clay particles are less than 0.002 millimeters in diameter.

**How to determine soil texture by feel**

Laboratory analyses of soil texture are costly and take time, while feeling soil texture by hand is quick, free, and, with practice, highly accurate. The two basic steps in the texture by feel method are shown in figures 1 and 2.

After completing these two steps, and following the flow chart diagram, determine the soil textural class for your soil sample. The textural triangle organizes the textures into 12 classes. Notice that the loam textures are toward the middle of the diagram, because they contain a significant amount of sand, silt, and clay.

The term coarse-textured is often used for soils that are dominated by sand. Fine-textured refers to soils that are dominated by clay, and medium-textured soils are a more balanced mixture of sand, silt, and clay particles.

**Why is soil texture important?**

Soil texture is one of the most important properties to know how to measure, as it affects many other chemical, physical, and biological soil processes and properties such as the available water-holding capacity, water movement though the soil, soil strength, how easily pollutants can leach into groundwater, and the natural soil fertility.
Soil Properties Related to Texture

<table>
<thead>
<tr>
<th>Property</th>
<th>Coarse</th>
<th>Medium</th>
<th>Fine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water storage</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Water movement</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Power needed for digging or tillage</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Wind or water erosion (Ease of particle detachment)</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Wind or water erosion (Ease of transport)</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Plant nutrient storage</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Contaminant movement</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
</tbody>
</table>

Soil Textural Classes

<table>
<thead>
<tr>
<th>Separate</th>
<th>Size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand</td>
<td>2 to 0.05</td>
</tr>
<tr>
<td>Silt</td>
<td>0.05 to 0.002</td>
</tr>
<tr>
<td>Clay</td>
<td>&lt;0.002</td>
</tr>
</tbody>
</table>
Procedure for Analyzing Soil Texture by Feel

Start

Place 25-50 g soil in palm. Add water slowly and knead soil to wet all aggregates. Soil is at the proper consistency when plastic and moldable, like moist putty.

Add more dry soil.

Yes

Does soil remain in a ball when squeezed?

No

Is soil too dry?

No

Is soil too wet?

No

SAND

Does soil make a ribbon 2.5 cm or less before breaking?

No

Does soil make a ribbon 2.5-5 cm before breaking?

No

Does soil make a ribbon 5 cm or longer before breaking?

Yes

Does the soil form a ribbon?

Yes

Does soil make a ribbon 2.5 cm or less before breaking?

No

Does soil make a ribbon 2.5-5 cm before breaking?

Yes

SILT

Does soil remain in a ball when squeezed?

Yes

Does soil too dry?

No

Is soil too wet?

No

LOAMY SAND

Does soil make a ribbon 2.5 cm or less before breaking?

Yes

Excessively wet a small pinch of soil in palm and rub with forefinger

Does soil make a ribbon 2.5-5 cm before breaking?

Yes

Excessively wet a small pinch of soil in palm and rub with forefinger

Does soil make a ribbon 5 cm or longer before breaking?

Yes

Excessively wet a small pinch of soil in palm and rub with forefinger

SANDY LOAM

Does gritty feeling predominate?

Yes

SANDY CLAY LOAM

Does gritty feeling predominate?

Yes

SILTY CLAY LOAM

Does smooth feeling predominate?

Yes

SANDY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?

Yes

SILTY CLAY

Does smooth feeling predominate?
DeAnn Presley,
Extension Specialist
Assistant Professor of Agronomy

Steve Thien
Professor of Agronomy