Soil Physical Properties

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Soil Health Research
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Soil Function, Soil Properties and Soil Health

**PHYSICAL**
- Soil compaction
- Water infiltration
- Aggregate stability

**ORGANIC MATTER**
- Potentially mineralizable nitrogen
- % Organic Matter
- Respiration

**CHEMICAL**
- pH
- Potassium
- Phosphorus
- Ca, Zn, Mg, Mn

Ministry of Agriculture, Food and Rural Affairs
Soil Physical Properties

- Soil texture
- Soil structure
- Aggregate stability
- Bulk density
- Available water capacity
- Soil colour
Soil Texture

Mineral fraction:

- Stones
- Gravel
- Sand (very fine to coarse) – 0.05 to 2.0 mm
- Silt – 0.002 to 0.05 mm
- Clay - < 0.002 mm
Soil Structure

- Physical arrangement of mineral and organic particles

Granular

Prismatic

Massive
Aggregate Stability

How well aggregates resist falling apart when wetted and hit by rain drops.
Bulk Density

- The mass of a certain volume of soil
- Includes solids and pores
- Sands 1.4 - 1.6 g/cm³
- Other soils 1.2 – 1.4 g/cm³
- Compacted soil up to 1.7 g/cm³
Available Water Capacity

• The quantity of water a soil can store for plant use
• Calculated as the difference between water stored at field capacity and the wilting point
## Available Water Capacity

<table>
<thead>
<tr>
<th>Texture</th>
<th>O.M.</th>
<th>Clay</th>
<th>Silt</th>
<th>Available Water</th>
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<tr>
<td>Sands</td>
<td>1.2</td>
<td>3.3</td>
<td>2.6</td>
<td>2.9</td>
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<tr>
<td>Sandy loam</td>
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<tr>
<td>Loam</td>
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<tr>
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<tr>
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