SOIL TEXTURE

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AGB D

SOIL TEXTURE

➔ *Relative comparison of soil single particle*

➔ *Relative comparison between sand, silt and clay*

Sand
Silt
Clay

} *Soil particle =* *Varied size components*

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Soil texture is very important because it relates and the impact on:

- *soil structure*
- *aeration*
- *water holding capacity*
- *water movement*
- *nutrient storage and soil chemistry*
- *etc*

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Loam texture

comparison of sand, silt and clay is balance

Sand (45 %) **Silt (30 %)** **Clay (25 %)**

Easy tillage

Absorption (transfer) the water well

Loam soil (physic) not necessarily fertile

➔Fertility based on soil structure ➔ Crumb soil

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How to know and measure soil particle size

Stones and cobbles ➔ **> 64 mm (diameter)**
Gravel ➔ **2 mm – 64 mm**

Sand ➔ **.05 – 2 mm**
Silt ➔ **.002 – .05 mm**
Clay ➔ **< .002 mm**

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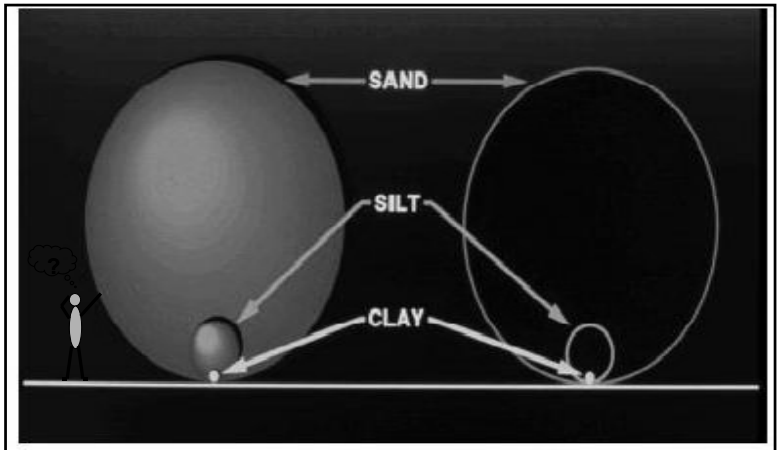

Relative sizes of sand, silt, and clay.

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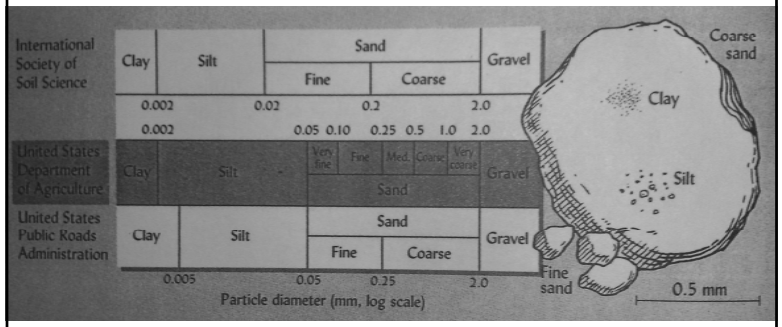
SOIL PARTICLES SIZE DISTRIBUTION



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Particle

Size **Number** **Spesifik Surface**

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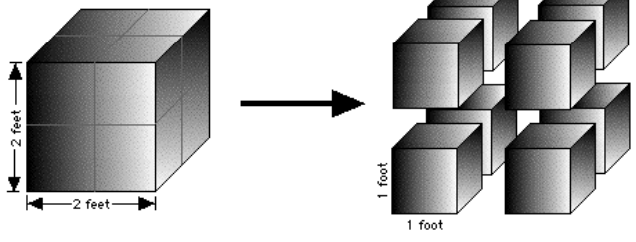

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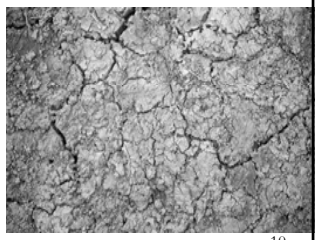
Pseudo / sham particle
➔ Silt or clay particles which form a larger particle size

Etc.
"Pseudosand/Shamsand"
➔ Silt particles which form sand particle



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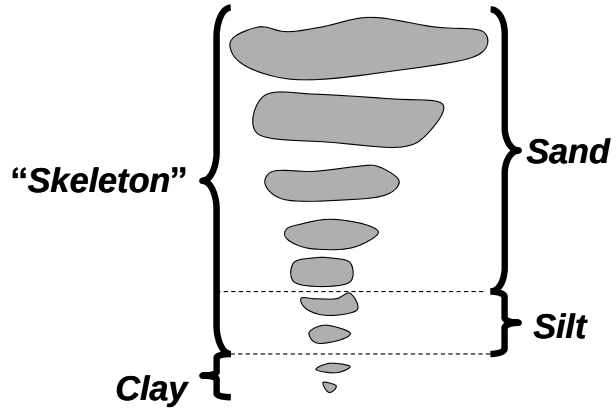
Primary Particle
Particle Single Circle



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"*Skeleton*" form aggregate cause:

- ***Organic matter***
- ***Clay***
- ***Sesquioxide*** **(*Al and Fe oxide / hydroxide*)**
- ***Alophane*** **(Oxide Si amorf / coloid)**

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STOKES LAW

Particle velocity (fraction) which settle through a liquid medium depend on determination and particle diameter

Force which work in particle is gravity acceration, floats force and friction force

➔ The largest particles settle first in solution

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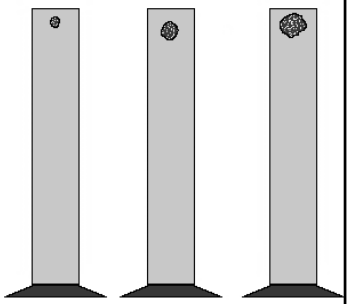
$$V = \frac{2(dp - d)\, g\, r^2}{9\,\eta}$$

v : *velocity*
dp : *density of particle*
d : *density of liquid*
g : *gravity acceleration*
r : *radius of particle*
η : *viscosity of liquid*



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How to analysis of soil texture
1. **Mechanic method (quantitative)**
2. **Feel method (qualitative)**

Laboratorium Analysis:
1. **Hydrometer method**
2. **Pipette method**

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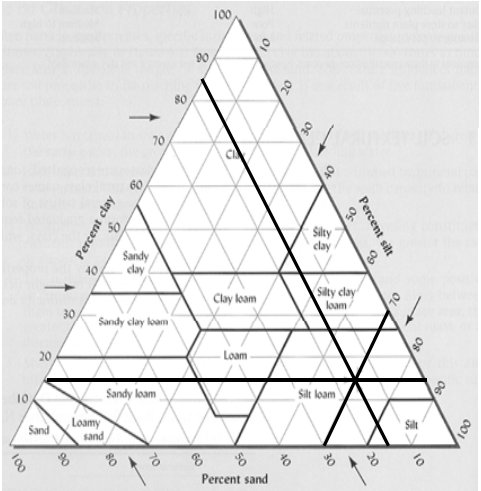
USDA Textural Triangle



Generalized influence of Soil Separate on some properties and behavior of soil

Property/behavior	Sand	Silt	Clay
Water holding capacity	Low	Medium-High	High
Aeration	Good	Medium	Poor
Drainage rate	High	Slow-Medium	Very slow
SOM level	Low	Medium-High	High-Medium
Decomposition of OM	Rapid	Medium	Slow
Shrink-swell potential	Very low	Low	Moderate-Very high
Pollutant leaching potential	High	Medium	Low
Ability to store plant nutrients	Poor	Medium-High	High
Resistance to Ph change	Low	Medium	High