Healthy Soil or Poor Soil Health: It is all about Soil Organic Matter and its management

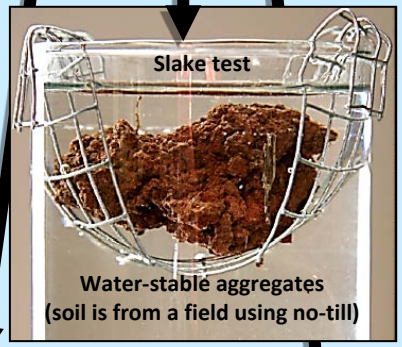
Emphasis on Soil Organic Matter Management (Earthworms in a Chile field at Deming, NM)

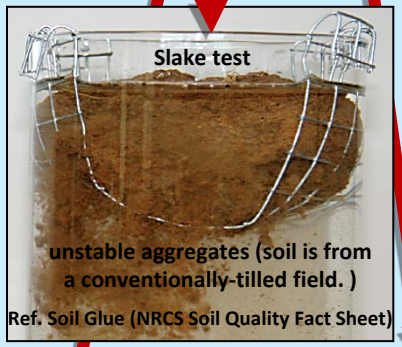
Healthy Soil

HIGH Soil Organic Matter

Soil macro-aggregates, which are formed by the SFW and roots, provide a well-aerated soil and optimum physical environment for a diverse SFW and roots to flourish. A healthy soil will have:

- Higher water-holding capacity
- Lower evaporation
- Higher water-use efficiency
- Lower soil temperature
- Higher infiltration rate & less runoff
- Water-stable aggregates (refer to slake test photos)
- Good drainage/permeability (refer to infiltration demo photos)
- Optimal nutrient cycling (i.e., soil has a diverse SFW)
- Higher drought tolerance
- Higher buffering capacity





Poor Soil Health

LOW Soil Organic Matter

Excessive Tillage (e.g., moldboard plow & deep disking), fallow & low residue crops results in a poorly-aerated soil and a poor physical environment (e.g., crusting). This leads to a bacterial-dominated SFW and an increase in wind and water erosion, excessive surface runoff, and other problems (e.g., diseases, weeds, nutrient losses, etc.). Poor soil health will have:

- Lower water-holding capacity
- Higher evaporation
- Lower water-use efficiency
- Higher soil temperature
- Lower infiltration rate and more runoff
- Unstable aggregates (refer to slake test photos)
- Poor drainage/permeability (refer to infiltration demo photos)
- Poor nutrient cycling (i.e., soil has a bacterial-dominated SFW)
- Lower drought tolerance
- Lower buffering capacity

From a SFW organisms perspective, which castle would you live in?

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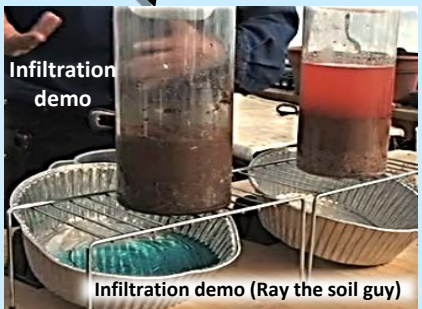
The maintenance of a high degree of aggregation is one of the most important goals of soil management. (Ref.: The Nature and Properties of Soils, 14 Edition revised. Chapter 4)

Water-stable macro-aggregates of various sizes are the building blocks of the earth castle, where a diverse SFW lives.



Soil Health Planning Principles:

- Use plant diversity to increase the diversity in the soil biota
- Keep a living root growing throughout the year
- Keep the soil covered as much as possible
- Manage more by disturbing less
- Livestock integration where applicable

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Soil Health Reference: USDA-NRCS -- Unlock the Secrets in the Soil (http://www.nm.nrcs.usda.gov/technical/handbooks/iwm/nmiwm.html)