Soil slake test

How stable is your soil?

A soil's stability demonstrates its capacity to resist disruption when outside forces such as rain, wind or compaction are applied. The stability is important for a variety of reasons such the rate of water infiltration, root growth, and resistance to water and wind erosion. The more stable a soil is, the greater the biological activity, energy flow, and nutrient cycling found within it. Soil particles are bound together by glomalin, a protein produced by fungi that allows for soil aggregates, creating pores and channels for water, plant roots and macroinvertebrates as they move within the soil. This activity measures the stability of soil when exposed to rapid wetting.

Materials

- 1000 mL beaker
- Water
- Soil samples
- Wire mesh (Hardware cloth)

Instructions

1. Collect several samples of topsoil about the size of a small apple. (It will need to be able to fit within your beaker without touching the sides of the container). *It is best to collect samples from the same soil type for comparison purposes. These samples should be removed with a small spade or hand shovel from 3–5 inches below the surface and be collected in their entirety to prevent loss of soil stability.*
2. Position wire mesh over the rim of the beaker to make a "shelf" that will extend down into the beaker and will be able to hold the soil sample while it is submerged in the water. Remove wire mesh from beakers.
3. Fill the beakers with water until they are almost full (½ to 1 inch from the top) and will cover the soil samples.
4. Place the soil samples onto the wire mesh and gently submerge the soil samples into the beakers of water at the same time.

   Observe each soil's stability (its capacity to resist disruption) over 1 minute intervals, record data in the table below.

Sample	**Time (minutes)**	**Soil stability**	**Water clarity**	**Notes *(loose sediment, action of water on soil, etc.)***
	1			
	2			
	3			
	1			
	2			
	3			
	1			
	2			
	3			

Adapted from https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051280.pdf

Reflection

1. What is the difference between good and poor soil stability? How is this demonstrated in the soil slake test?
2. What happens to soil with poor stability when intense rain comes in contact with it? Why does this happen?
3. How does soil stability impact a soil's ability to produce crops?
4. How can a farmer improve soil stability?