

Soil stability test

Focus questions	How do soils differ in stability? What helps soil to be stable?
Vocabulary	Glomalin, fungi

A soil's stability demonstrates its capacity to resist disruption (or slake) when outside forces such as rain, wind or compaction are applied. The stability is important for a variety of reasons: the rate of water infiltration, root growth, and resistance to water and wind erosion. This activity measures the stability of soil when exposed to rapid wetting.

Materials

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

Procedure

1. Collect several sample clumps of topsoil about the size of a small apple. (It will need to be able to fit inside the top of your beaker without touching the sides of the container.) Try to find samples from different land uses (i.e. from a flower bed, from a yard (remove grass and roots), from an area near a sidewalk that has no vegetation, etc.).
Note: 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 (1/2 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.
5. Observe each soil's stability (its capacity to resist disruption) over 1 minute intervals and record data in the table below.

Data

Sample location	Time (min.)	Soil stability	Water clarity	Notes (<i>loose sediment, action of water on soil, etc.</i>)
	1			
	2			
	3			
	1			
	2			
	3			
	1			
	2			
	3			

Reflection

1. What causes the difference between soil samples?
2. What is the difference between good and poor soil stability? How is this demonstrated in the soil slake test?
3. What happens to soil with poor stability when intense rain comes in contact with it? Why does this happen?

4. How does soil stability impact a soil's ability to produce crops?

5. How might a farmer improve soil stability?

Rubric for self-assessment

Skill	Yes	No	Unsure
I can determine which soils have higher stability.			
I can determine the advantages of soils with higher stability when compared to soils with less stability.			
I can explain how soil stability is related to soil microbes, soil texture and soil nutrients.			