

Loss of Topsoil – Teacher Demonstration

Teacher demonstration

Materials

- A bucket
- Water
- An area of lawn
- A similar sized area of sandpit or un-vegetated soil

Method

1. Half fill the bucket with water and ask a student to swill it onto the lawn.
2. Observe the effect of the “flood” on the grassed area.
3. Repeat on the area without vegetation.

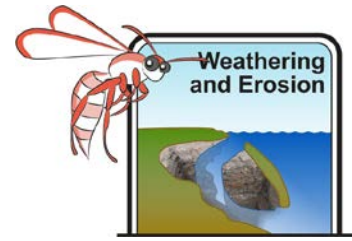
Observations

Effect of vegetation on soil loss	Effect of no vegetation on soil loss
Roots held the topsoil together and the flood only slightly scoured a channel in the soil	The flood scoured out a channel in the sand and moved away most of the soil to be dumped elsewhere

Vegetation protects the flooded area and stops dumping downstream.



The effect of flooding on vegetation. This riverbank has been stripped away.



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When floodwaters cover vegetation for any time many plants die. They die because:

1. The energetic water movement and carried debris will uproot plants and damage them. Floodwater also exposes plant roots by carrying away precious topsoil.
2. They cannot access oxygen for respiration (energy production) because of the barrier of covering water.
3. They cannot access carbon dioxide to make their own food through photosynthesis. Because of the barrier of covering water
4. Floodwater is murky and full of silt. Light cannot penetrate the water to power photosynthesis. As water movement subsides silt settles out to cover the plants.
5. Floodwater is colder than the air above and this slows plant growth and recovery. (The enzymes necessary for plant activity are only optimal between the temperature ranges that plants would normally experience).
6. Good topsoil is washed away leaving poorer soil below

Anaerobic bacteria thrive in the nutrient rich, damp, oxygen poor environment left as everything dries out. The stink of incomplete decomposition is unforgettable and disgusting.