Name(s)

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Project Number

J0627

Project Title

Sinking Soil

Abstract

Objectives/Goals

The researcher's goal was to determine which soil additive out of polymers, bark or styrofoam, when mixed with soil, would be the most stable when water is added and after a simulated earthquake.

Methods/Materials

Materials: Plastic container, 4 wooden dowels, dirt, bark, styrofoam, polymers, hammer, force measuring device, water, shovel, ruler, data sheet.

Method: The steps for each additive were the same. Fill the container with soil/additive, measure to the top of container, insert dowels at four depths, add water, place weight on top, wait 1 hour, measure comaction, log results, tap all sides with hammer, measure compaction, log results, pull out each dowel with force measuring device, log results.

Results

The soil alone compacted 3" after saturation and another .5" after stimulus. The pounds of pressure needed to remove dowel #1 was 3lbs, #2 was 5lbs, #3 was 7lbs and #4 was 9lbs. The polymers and soil mixture compacted 3.5" after saturation and another .25" after stimulus. The pounds of pressure needed to remove dowel #1 was 2lbs, #2 was 4lbs, #3 was 4lbs and #4 was 3lbs. The bark and soil mixture compacted 3.5" after saturation and another 1" after stimulus. The pounds of pressure needed to remove dowel #1 was 4lbs, #2 was 6lbs, #3 was 2lbs and #4 was 12lbs. The styrofoam and soil mixture compacted 3" after saturation and another 1.25" after stimulus. The pounds of pressure needed to remove dowel #1 was 5lbs, #2 was 3lbs, #3 was 3lbs and #4 was 2lbs.

Conclusions/Discussion

The polymers were the most successful soil additive. The soil and polymers mixture sank a total of 3.75 inches. The soil alone sank a total of 3.5 inches. Although the soil alone sank the fewest total inches, the polymers and soil mixture showed the less compaction after the simulated earthquake.

Summary Statement

The most effective soil additive with the least amount of compaction after saturation and a simulated earthquake.

Help Received

Mother helped type report. Father helped with graphs.

Ap2/05