CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)
Michael A. Castillo

Project Number
S0801

Project Title
Which Organic Material Has the Least Soil Compaction Rate and Allows for the Best Plant Growth?

Abstract

Objectives/Goals
My objective was to determine which organic material had the least soil compaction rate and allowed for the best plant growth. My goal was to prove that grape extract had the least soil compaction rate and allowed for the best plant growth.

Methods/Materials
My method was to fill a 5 gallon bucket 3/4 of the way with top soil mixed with 2 cups of the organic material with a wooden dowel sticking out of the bucket with a hook screw attached. Next, attach the compaction tool and pull from bucket and record the measurement in newtons. Thereafter, use the soil to grow wheat grass. The materials used were soil, 5 gallon bucket, dowel, water, grass clippings, small rocks, leaves, wood chips, potato peels, grape extract, compaction tool, measuring cup, hook screw, drill and drill bit, 2 bricks, ruler, wheat grass, 10"x20 1/2" container, and 20"x9 3/4" wooden pallet.

Results
The results of my project were that grape extract had 5 centimeters of growth and 11.5 newtons of compaction rate. Leaves had 3 centimeters of growth and 9 newtons of compaction rate. Potato peels had 3 centimeters of growth and 8 newtons of compaction rate. Wood chips had 3.5 centimeters of growth and 6 newtons of wood chips. Control had 4 centimeters of growth and 9.5 newtons of compaction rate. Grass clippings had 2.5 centimeters of growth and 7 newtons of compaction rate. Small rocks had 2 centimeters of growth and 9 newtons of compaction rate.

Conclusions/Discussion
After completing my investigation, my hypothesis was both incorrect and correct. My hypothesis was that grape extract had the least soil compaction and allowed for the best plant growth. Grape extract allowed for the best plant growth while wood chips allowed for the least soil compaction rate.

Summary Statement
To prove which organic material mixed with soil had the least soil compaction rate and allowed for the best plant growth.

Help Received
Father assisted with preparing bucket and dowel and gathering grape extract. Mother assisted with setting up graph.