CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)

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Project Number

J1030

Project Title

No Longer Delicious: A Study of the Effects of Different Soils on the Biodegradation Rate of Organic Matter

Abstract

Objectives/Goals

The purpose of this project is to determine the effect of a change in the type of soil (sand, silt, clay, loam, and base, or backyard soil) used to cover red delicious apple slices on their rate of biodegradation. Research suggested that the rate of biodegradation in sandy soil would be the highest.

Methods/Materials

Three pots (one for each run) of each soil type were used, for a total of 15 pots. Each pot contained two apple slices in a mesh bag sandwiched between 3 cm of soil on the bottom and 8 cm of soil on top. Every other day for 20 days, the apple slices were weighed and observed, and observations were compared with a reference sheet to determine the stage of decomposition. Soil moisture was also measured.

Results

Clay apples had the highest average cumulative weight loss (26.3 g), followed by base (19 g), loam (16.3 g), sand (14.3 g), and silt (13.7 g). At day 20 (end of experiment), clay apples also reached the highest average stage, followed by base again, then silt, loam, and sand.

Conclusions/Discussion

Organic matter will actually decompose the fastest in anaerobic conditions when covered with clay soil and second fastest when covered with base soil that likely contained a high percentage of clay. No significant difference in the rate of decomposition occurs when organic matter is covered with loam, sandy soil, or silty soil. My data indicate that clay soil is the best soil cover to use in a "no-service" compost pile, and that landfills should experiment with using clay in the six-inch soil covering that is placed over trash daily in order to speed up biodegradation.

Summary Statement

This project examines the effects of different soil coverings on the biodegradation rate of red delicious apple slices in order to determine which soil will optimally promote biodegradation in no-service compost piles.

Help Received

Observations stated verbally by me were written down by a family member