CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)

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Project Number

S1105

Project Title

A Study of the Effectiveness of Commercially Available Soil Erosion Control Products

Abstract

Objectives/Goals

The objective of this experiment was to determine the most effective soil erosion control products under wind erosion simulations and also subsequently how effective these control products were at their price points.

Methods/Materials

For this experiment, I used six different types of geotextiles which are all commercially available. These geotextiles were provided by Pacific Soil Stabilization. An additional control product I used was a Xanthan Gum solution. I used a large, industrial fan set on its highest speed to simulate wind erosion for the soil. I placed each container of soil with one of the control product and also one with no control products. I placed the containers in front of the large fan and turned it on for five minutes. I weighed the containers and recorded their change in soil mass after each trial. I repeated this procedure for twenty trials.

Results

After conducting twenty trials and calculating the percent change in soil mass, the most effective geotextile in the simulations was geotextile (G2) Landlok 450. This geotextile was composed of a dense web of crimped polypropylene fibers and had a an average percent change in topsoil mass of -0.149%. The price points of each control product were also analyzed to their change in soil loss. When compared to prices, it was geotextile (G4) Excel CC-4 that was the best performing geotextile. This shows that between price points and effectiveness that there are two effective methods to controlling soil erosion.

Conclusions/Discussion

It can be concluded that the best performing geotextile was the Landlok 450 in terms of retaining the most soil. However, Excel CC-4 was also the most effective in terms of cost. This shows that there are multiple control products that can be effective. This also brings an economical application that expands our knowledge on soil erosion control products and their cost effectiveness. This study is valuable to farmers, home owners, and environmental agencies who need an affordable practical, and effective solution to preventing soil erosion.

Summary Statement

I conducted a wind erosion simulation to determine which commerically manufactured, soil erosion control products are the most effective in retaining its soil and cost effective.

Help Received

My Summer Science Institute Advisor, Mr. Magni, helped secure the donated geotextiles for this experiment. He also helped to analyze the data from the experiment. However, I logged the data and conducted the experiment on my own.