



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

Name(s) Brantley Ryan	Project Number S1120
Project Title The Effects of Simulated Rain on Varying Types of Erosion Control Methods	
<p style="text-align: center;">Abstract</p> <p>Objectives The objective is to analyze different types of methods to minimize hillside erosion after a forest or hillside fire and define which method is the most effective in reducing sediment runoff. It must take into consideration cost of implementation and practicality.</p> <p>Methods In order to properly study the effect of varying hillside soil retention methods, a simulated hillside must be built. There will be 5 tested groups, the control group will be rye grass only. The experimental groups will be rye grass and mulch, rye grass with mulch and burlap netting, rye grass with straw, and rye grass with hydro-seed. The experiment will have a sample size of 3. The independent variable will be the varying soil retention methods used in each group. The dependent variables will be the amount of sediment run-off, and the weight of each sediment capture material to determine the amount of erosion. The hillside must be able to isolate the varying soil samples and retention methods. There are three phases of procedures; phase one set-up, phase two growth and monitor, phase three simulate rain and measure run-off.</p> <p>Results The results showed evidence that the Rye Grass with Straw method had the least amount of soil runoff and the entire root system was connected, demonstrating the strongest roots out of all the methods. There was a similar erosion outcome with the Mulch with Netting method, however, the root system was not as strong and would not be as universally practical and cost effective to implement. The Hydroseed and the Rye Grass method pulled out small clumps of soil, clearly demonstrating an ineffective method of erosion control. Finally, the Rye Grass with Mulch method pulled out in large clumps, which demonstrated a small root system and was extremely loose, so this method was also considered ineffective when compared to the Rye Grass with Straw method and the Mulch with Netting method.</p> <p>Conclusions This experiment undoubtedly displayed that using soil retention methods post hillside burn is beneficial and essential to keeping mudslides and erosion from occurring during rainfall. It was evident that the Rye with Straw method prevented erosion and sediment runoff the most effectively, as that was the method with the least amount of runoff, the strongest root system, and the most amount of grass growth. The Rye with Mulch Netting method also prevented soil erosion very well, but slightly less than the straw. It also fell behind in the growth of the grass over time. The Rye with Mulch method and the Hydroseed method both had increased amounts of sediment runoff, showing that those methods were ineffective at preventing erosion.</p>	
Summary Statement My project, "The Effects of Simulated Rain on Varying Types of Erosion Control Methods", is about identifying the most effective way to mitigate the threat against catastrophic destruction by mud slides in hillside burn areas.	
Help Received My father helped drive me to various places in order to gather supplies for my project. He also helped me build my raised platform and taught me how to use a mitre saw to cut wood. An employee from Lowe s Hardware Store cut the longer pieces of wood to my specifications. My mother helped me proofread my	