



CALIFORNIA STATE SCIENCE FAIR 2017 PROJECT SUMMARY

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Project Title Holding It All Together: A Study of How Efficient Plants Are at Decreasing Soil Erosion	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of this study was to provide greater insight in terms of which aspects are most capable of reducing soil erosion utilizing a natural, practical method such as planting vegetation. Once research of plausible benefits of vegetation as well as various issues continuing to arise due to erosion was performed, it was hypothesized that: if dark star zucchini, catnip, cherry radishes, and rye grass are planted on slopes, then these slopes will exhibit less water erosion than a comparable hillside that is unvegetated.</p> <p>Methods/Materials 10 trays total, 2 for each plant type, 2 for bare soil (control), sun-lit environment for sprout growth, watering can with spout allowing full area coverage as if it were rainfall, scissors to create an opening for soil to erode from, protractor to form a 55° angled slope, stopwatch to end pouring after 10 seconds, strainer to measure runoff, measuring cup and scale to weigh eroded soil, ruler to find root length. Measured whether vegetated slopes decreased water erosion during the trials and if so, by how much. Two trials performed with 14 days inbetween to understand if time impacted erosion levels.</p> <p>Results When observing the amount of soil eroded in grams, percent of soil eroded, average root length in millimeters, runoff levels in cups, and total differences between the slopes with and without sprouts overall, it was apparent that the vegetated slopes eroded significantly less soil. Each aspect improved for the sprouts between the 14 days, while the bare soil only worsened with time.</p> <p>Conclusions/Discussion Overall, the experiment's data supported the hypothesis as the vegetated slopes decreased soil erosion by almost 90% compared to solely soil, and continued to reduce it given more time. The catnip and cherry radishes were especially successful as they eroded only 10 g in trial 2 compared to 40 g in trial 1, perhaps due to the ability to effectively shield the soil, absorb the most water, and because the root systems became increasingly complex and stable. Runoff levels for the slopes with sprouts also improved as the growing plants required more water over time, while the control slope weakened as it could contain less. From this project's outcomes one can recognize that planting even a simple ground cover such as catnip is preferable to bare, vulnerable soil that can be easily displaced in mere moments to further contaminate important waterways or even entire ecosystems.</p>	
Summary Statement It was observed that the average individual is capable of aiding the environment by combatting the serious issue of erosion using a natural and feasible method of planting vegetation, rather than solely expensive, extravagant practices.	
Help Received I designed the project myself once researching water erosion on slopes & growth methods; my Anatomy and AP Physics teachers reviewed my results.	