Name(s)

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Project Number

J0925

Project Title

Rich Soil or Not Rich Soil? That Is the Question

Abstract

Objectives/Goals

The objective of my project was to determine in which environment of the Monterey Peninsula plants thrived most, and to determine if this correlated with the soil of that environment having the optimal amount of nutrients for plant growth. I hypothesized that the quality of the soil and the amount of nutrients in each environment would be varied, but the plants would thrive most in the Salinas Farmland soil, which would have the optimal nutrient combination.

Methods/Materials

I obtained a 3 gallon sample of soil from each of five different environments of the Monterey Peninsula. Using five species of non-native plants, I planted each of the five plants in sets of five pots, each set containing soil from a different environment. As the plants grew, each plant's growth was measured and recorded. At the end of 6 weeks, the amount of plant growth was compared. After testing the amount of nutrients in each soil with a soil test kit and evaluating each soil#s texture and composition, I was able to determine which environment has the richest soil.

Results

All soil samples were within the optimal pH level for most plants. Each soil sample contained an adequate amount of nitrate nitrogen, phosphorous, and potassium, but the Salinas Farmland sample had the best nutrient combination. Because the Salinas farmland sample contained the best combination of nutrients, I believed that this would translate into high plant growth, but I was wrong. Instead, the plants thrived most in the Laureles Grade summit sample.

Conclusions/Discussion

My results proved my hypothesis incorrect. While the Salinas farmland soil did have the best nutrient combination, this did not translate into significant plant growth. Surprisingly, the average plant growth for the Salinas farmland sample was the lowest of the five environments. Subsequent soil texture testing revealed this clay loam soil type to be too dense to allow the absorption of nutrients by roots. Plant growth was greatest in the Laureles Grade summit sample because it was the only soil sample to contain both macro invertebrates and organic matter, which reduced the density of the soil and allowed what nutrients it contained to most effectively nourish the plants. The results of my experiment show farmers and gardeners that their soil needs to have organic matter in it and cannot be too dense, so that all of the essential nutrients for plant growth can be absorbed by the roots.

Summary Statement

My project determined which environment of the Monterey Peninsula is best for growing plants and what soil attributes contributed to the plant growth.

Help Received

My mother helped me to obtain soil from the five locations in Monterey County and helped acquire research materials at several libraries. My science teacher, Mr. Schmottlach, answered any question that I had about my experiment and provided me with the greenhouse.