CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
22492

Project Title
To Waste or Not to Waste: Does Adding Biosolids Affect the Biodiversity of Silage Cornfield Soils?

Abstract

Objectives/Goals
My purpose is to test three different soils to see which one contains the highest level of biodiversity. I will be testing soils from fields that contain animal fertilizer, bio-solid fertilizer and no fertilizer at all.

Methods/Materials
I collected soil samples from a ranch in Western Kern County. I placed 10ml of soil in a graduatt cylinder with 90ml of sterile distilled water and shook it vigorously for one minute. Then, I placed 10 ml of the solution into another cylinder with 90ml of sterile distilled water and shook it vigorously again. I repeated this dilution one more time. With a sterilized inoculating loop, I transferred one drop from the last solution onto culture dishes. I let the cultures grow at room temperature. Bacteria and fungi started growing within 24 hours. Counts were made after 48 hours.

Results
The non-fertilized soil produced the highest level of biodiversity with a total of 595 colonies per 24 petri€ dishes. The biosolid-fertilized soil produced a total of 258 colonies per 24 petri dishes and the animal fertilized soil produced a total of 303 colonies per 24 petri dishes.

Conclusions/Discussion
After 72 petri dishes, biodiversity tests and pH level readings, I have come to the conclusion that x hypothesis is partly correct due to the fact that the bio-solids did affect the biodiversity, not by nutrien€ amount, but by pH level. The bio-solid soil had less biodiversity than both the non-fertilized soil and the animal fertilized soil. The pH level is higher in both bio- and animal fertilized soil. The pH level was lower in the non-fertilized soil, resulting in a higher level of biodiversity. Other factors, such as tilth and soil structure, could affect the results of this project. It appears that pH limits biodiversity, but furthe€ testing is required to gather more conclusive data.

Summary Statement
Adding bio-solids to soil does affect the biodiversity of the soil.

Help Received
My science teacher, Mr. Duerr, helped with the design of the experiment. My mother helped with the typing. Mr. Mike Car, of the Ag Extension Office, helped with the testing of the soil pH levels.