CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
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Project Number
S1620

Project Title
The Effect of Runoff Water on Corn Plant Growth

Abstract

Objectives/Goals
This experiment tested the effect of common types of runoff water on corn plant growth. Runoff is an important issue in our communities. There are several types of runoff water in my community that might be harmful to plant growth.

Methods/Materials
Four types of runoff water from my neighborhood were tested: street gutter runoff, gas station runoff, garden runoff, and Bushy Dell Creek water. Spring water was used as the control. One hundred corn seeds were planted, twenty for each experimental group. The five experimental groups of plants were each watered with a different type of water. Growth was measured and recorded for a period of 22 days. On the final day, root length was also measured. The Paired Two Sample for Means t-Test was used to analyze the significance in differences in growth between the control and the experimental groups.
The runoff waters and spring water were tested with a water test kit for bacteria, lead, pesticides, nitrate/nitrite, nitrite, chlorine, pH, and hardness.

Results
By Day 13, all of the experimental groups, gutter runoff ($p = 0.04$), Bushy Dell Creek water ($p = 0.004$), gas station runoff ($p = 0.004$), and garden runoff ($p = 0.00008$) experimental groups showed statistical significance compared to the control group.
The water sample testing indicated that none of the water types had levels beyond EPA standard guidelines for lead, pesticides, nitrate/nitrite, nitrite, pH, or chlorine. Only gas station and gutter runoff tested positive for bacteria. Only Bushy Dell Creek water tested positive for chlorine (2.0 ppm), although this was below EPA standards. Except for gas station runoff, all of the water samples had above EPA standards for hardness. Hardness is the mineral content of water. This may suggest that spring water has a lot of minerals. Gas station water had the lowest level of hardness (50 ppm), while garden runoff had the highest level of hardness (250 ppm).

Conclusions/Discussion
The hypothesis tested was that runoff water would adversely affect corn plant growth. The experimental results supported the hypothesis. The results were statistically significant, so the conclusion was that the tested runoff samples adversely affected corn plant growth. Possible causes for the adverse effect of runoff water on corn plant growth were suggested.

Summary Statement
This experiment tested the effect of common types of runoff water on corn plant growth.

Help Received
My mother helped me obtain plant supplies and runoff water.