CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)

Mike M. Pilegard

Project Number

29167

Project Title

Is It Easy Being "Green"? Comparing "Green" and Conventional Cleaners on Environmental Impact, Quality, and Cost

Abstract

Objectives/Goals

My project was to determine if "green" cleaning products are better for the environment,your budget and your household cleanliness than conventional cleaners. My hypothesis states, the "green" cleaners will be better for your environment, but will cost more and not work as well as conventional cleaners.

Methods/Materials

I will be testing the environmental impact of fumes, runoff, drywell leeched soil, and grey irrigation water that have been contaminated with household cleaners. I will test indoor air pollution by various cleaners' fumes by putting cleaners onto a cup lid and placing it onto a cup with mealworms and recording the death rate. I will test soil pollution around a drywell by pouring diluted household cleaners into the soil with earthworms and record death rate and reactivity of the worms. I will test grey water polluted with cleaners by replicating a grey water irrigation system, then irrigating bean seeds placed in Ziplock bags with papertowels. Germination rate will be recorded. Runoff will be tested by recording the pH changes of river water samples, using a pH indcator, when diluted cleaners are added. The quality of the cleaners will be tested by using auto oil, dirt, berry stains, dried muddy water and spaghetti sauce applied to surfaces such as white tile and glass. All experiments will be conducted 10 times for each cleaner and a control when needed. Cost of the products will be compared.

Results

"Green" cleaners caused the least amount of change in green bean germination rate and earthworm reactivity, tied with the conventional cleaners on the indoor air pollution, and caused the most amount of change in the pH of river water. Conventional cleaners cleaned the best and cost less.

Conclusions/Discussion

My project was to test off the shelf cleaning products. Many consumers want an environmentally safe, high quality and inexpensive cleaning product. When consumers see "green" or environmently safe they expect that. I tested this expectation on many environments that are impacted by the disposal and use of cleaning products. I also tested quality on typical stains and surfaces and explored cost. My hypothesis was correct. "Green" cleaners are better for the environment. Conventional cleaners are better in quality and average cost. However, consumers need to know the "green" cleaners did affect the environment, just not as much as the conventional cleaners.

Summary Statement

My project focuses on when a consumer looks at a so called "green" cleaner, they want to know if this cleaner fits this claim, in a way that is better than conventional cleaners regarding the environment and including cost and quality.

Help Received

My dad drilled holes into the bucket. My mom helped me type, tape and cut. Parents paid for everything and supervised.