CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)

Casey M. Campos

Project Number

31198

Project Title

How Will Diluted Concentrations of Heated Herbicide Affect the Killing of Plants?

Abstract

Objectives/Goals

The purpose of my science fair project was to discover a less toxic and less expensive way to kill unwanted plants by reducing the amount of herbicide used. People should take interest in this experiment because it suggests that they can reduce herbicide amounts with successful results.

Methods/Materials

I approached this experiment using 200 square feet of Fescue sod and reduced amounts of Roundup herbicide concentrate at 75%, 50%, and 25% of the recommended dosage for one cup. Then, mixing in a thermally insulated sprayer to eliminate heat loss, I added one cup of 200 degree water to dilute the concentrated herbicide. Next, I immediately sprayed the mixture onto the sod test trials using three squirts per trial and an over-spray shield. I repeated this process for each heated herbicide concentration. For my control group, I poured one cup of 200 degree water into the thermal bottle without any herbicide and sprayed the trials. Each variable and the control group had 135 trials for a total of 540 test sections. I observed these variables for ten days, recording daily data for each trial.

Results

The diluted mixture at 75% was 98% more effective than the control trials at killing the targeted grass -- these trials also had significant death of surrounding grass indicating the roots were also killed; similarly, the 50% trial was 94% more effective at killing the targeted grass along with surrounding areas; while the 25% mixture was 25% more effective on targeted grass but lacked death of surrounding areas. The control group was least effective as some grass blades were initially scalded, but by the end of the observation period, had totally rejuvenated and showed no signs of discoloration.

Conclusions/Discussion

My conclusion confirms my hypothesis that herbicide temperature plays an important role in its effectiveness. My project contributes significant data to support that the consumer can save money and put fewer toxins into the environment by reducing the amount of herbicide and mixing it with extremely heated water. By using 200 degree Fahrenheit water when diluting Roundup herbicide, the concentration ratio can be reduced by 50% and still achieve desired results: totally killing targeted plant life. This translates to a minimum of a $500 million annual reduction in the net sales of Roundup, and a 50 million pound annual reduction of the herbicide used in the United States.

Summary Statement

Reducing the recommended dosage of Roundup by 50% and mixing the concentrate in extremely hot water is exceptionally effective at killing plant life while saving the consumer money and minimizing chemicals released into the environment.

Help Received

Father helped roll out Fescue sod; Mother helped with display board and took pictures while I did the procedure.