CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
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Project Number
34444

Project Title
Testing the Effects of Carbon Dioxide on Wheatgrass Plants

Abstract

Objectives/Goals
The objective of this experiment was to see how different levels of carbon dioxide affect plant growth.

Methods/Materials
Air was pumped through aquarium tubing into a carbonate-bicarbonate solution to produce specific levels of carbon dioxide. Carbon dioxide was pumped into a grow chamber where wheatgrass was growing, and then forced through an outflow tube into a cup of water. Each trial included wheatgrass grown in 200, 800, and 1000 ppm of carbon dioxide and the control which was 400 ppm of carbon dioxide. There were seven trials each of which lasted 12 days.

Results
The wheatgrass growing in 200 ppm of carbon dioxide grew .056% shorter, the wheatgrass growing in 800 ppm of carbon dioxide grew .004% taller, and the wheatgrass in 1000 ppm of carbon dioxide grew .064% shorter than the plants in a normal carbon dioxide level. Samples of carbon dioxide taken with Mylar balloons showed that the carbon dioxide levels in the grow chambers were higher than expected, therefore throwing off the results of the experiment. More trials would be needed in order to achieve accurate results.

Conclusions/Discussion
More difference in growth between the wheatgrass grown in the different carbon dioxide concentrations was expected. One reason for the results being different than expected could be soil respiration because soil respiration increased the carbon dioxide concentrations in the grow chambers. carbon dioxide is generally good for plants until a certain point, but when that point is exceeded, the plant is photosynthesizing so fast that it runs out of nutrients so the growth slows or even stops.

Summary Statement
This project tested to see how the growth of wheatgrass plants would be affected by different levels of carbon dioxide in the atmosphere.

Help Received
Mrs. Gillum provided mentoring on the process and many hours of editing. Dr. Lisa Welp provided valuable insight on the project, setup and background science. She also helped to test the carbonate-bicarbonate solutions and measure the carbon dioxide concentrations in the Mylar balloon