CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)
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Project Number
S1609

Project Title
Nutrient Uptake Efficiency in Corn and Wheat and Its Effect on Growth in a Hydroponics Setup

Abstract

Objectives/Goals
This project was done to determine if nutrient uptake efficiency affects the growth of plants, specifically corn (Zea mays) and wheat (Poacease triticum). Nutrient uptake efficiency gives an understanding of how the roots of plants observe nutrients in their surroundings.

Methods/Materials
First, two static hydroponics systems were built to grow the plants. Each hydroponics system contained a tray, a PVC frame, netting, Rockwool grow cubes and a pump. The test was conducted over a three-week period with height and nitrate measurements taken daily and then every two days. Nitrate measurements were taken using a nitrate test kit and spectrophotometer analysis. Nutrient uptake efficiency was defined as the acquired nutrients that the plants take up over the available nutrients.

Results
For all of the measurements the efficiencies for the two plants were consistent excluding occasional oddities. Corn had a higher uptake efficiency than wheat. However, wheat outgrew corn by approximately two times.

Conclusions/Discussion
The conclusion was made that as nutrient uptake efficiency within a species increases, growth rates will also increase. Also, comparisons of nutrient uptake efficiency to growth rate ratios between different species are not highly significant. This is because of the different growth patterns and nutrient allocation methods for each plant.

Summary Statement
My project tested to see if nutrient uptake efficiency affects plant growth.

Help Received
Used lab equipment at Viewpoint School; Communicated with mentor at University of Minnesota - Duluth