CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

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Project Number

36833

Project Title

The Effect of Tilting Phaseolus vulgaris Plants at a Forty Five Degree Angle on Biomass and Overall Growth

Abstract

Objectives/Goals

The purpose of this experiment was to test the effect of tilting Phaseolus vulgaris plants at forty five degree angles on their biomass production and overall growth.

Methods/Materials

Phaseolus vulgaris plants were all planted in cups in soil of the same brand and were watered with fifty milliliters of water every Tuesday and Thursday. Once the plants had germinated and began to grow, they were staked, four of them staked at forty five degree angles, and four of them staked and grew vertically at ninety degree angles. After the plants had grown for four weeks, the plants were measured for height, leaf count, leaf length, and were placed in an oven to dehydrate before massed using a Quadra-beam balance.

Results

The results of this experiment supported the hypothesis that tilting these plants would increase the biomass produced and aid in their overall growth. The control group plants grew to an average of about 39.030 centimeters, while the experimental group plants grew to an average of 60.960 centimeters. It was also observed that the control group produced on average about 1.86 grams of biomass, while the experimental group produced on average 4.57 grams of biomass. However, the control group had percent deviations of 35.032% and 48.3%, which is significantly larger than that of any of the trials for the experimental group.

Conclusions/Discussion

The plants in the experimental group showed a greater overall biomass as well as more successful overall growth. It can be concluded that the tilting of these plants at forty five degree angles is the cause for this, however, a way to ensure that conclusion would be to test this experiment on a wider variety of plant species in order to be confident in that conclusion. A way to expand on this experiment would be to not only try a wide variety of plants in this experiment, but to also grow these plants to full term as well as try other stresses and observe these effects on the plant growth and overall biomass.

Summary Statement

My project showed that tilting Phaseolus vulgaris plants at forty five degree angles increases their biomass production and overall growth.

Help Received

My chemistry teacher, Mike Antrim from Woodbridge High School, aided me in finding a category that interested me and was possible to design experiments for.