CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
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Project Number
J2024

Project Title
Fast Plants in Motion!

Abstract

Objectives/Goals
The objective of our project was to see how different amounts of rotation might differently affect the growth of plants. We placed Brassica rapa plants on a turntable for varying amounts of time, and observed the effects of prolonged geotropism on the plants.

Methods/Materials
We used an old record player and fit a cardboard circle the size of a record on the player. On the circle, we placed Brassica rapa plants in 1 oz containers of Miracle Grow Moisture Control soil and secured them to the cardboard with Quake Hold. Each plant was labeled in a group; namely, groups A, B, C, D and E. Group A, the control, received no rotation, and groups B, C, D, and E received 4, 8, 12, and 16 days of rotation respectively. As the plants rotated, we observed how the height, biomass, pigment, number of flowers, and angle growth of the plants were affected.

Results
We found a parabolic relationship between many of the groups in several variables. The average heights and biomasses produced parabolas between groups B, C, D, and E, with B and E as the lower extremes and C and D as the upper extremes. Coloration also showed a slightly parabolic relationship. This consistent parabolic trend may indicate that there is a certain amount of rotation, or the height of the parabola, that will make the plants grow at the ultimate best that they can, probably between 8 and 12 days of rotation.

Conclusions/Discussion
Each person had her own hypothesis. Alyssa thought rotation would make the plants grow inward, towards the center of the turntable. She also believed that rotation would affect the height, biomass, and angle of growth of the plants, but not pigment or number of flowers. Wendy, on the other hand, predicted that rotation would make plants grow outwards, away from the center of the turntable, and that only the angle of growth would be affected. It turns out that the angle of growth produced inconclusive results, because of the factor of phototropism, which made the plants grow towards the light. However, we noticed that height, biomass, and pigment all produced parabolic trends, suggesting a height of a parabola that indicates the best amount of rotation. The number of flowers was also inconclusive, due to insufficient time to see flowers bloom. Nonetheless, this information could be valuable, as there can be a certain controlled amount of rotation, that could make plants grow significantly healthier than without any rotation.

Summary Statement
The objective of our project was to explore how different time periods of rotation and geotropism would affect the height, biomass, pigment, number of flowers, and angle growth of Brassica rapa plants.

Help Received