

Science Project Final Report

Title Page

Project Title: The Impact of Organic vs. Synthetic Fertilizers on Plant Growth

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School: Central High School

Grade: 10th Grade

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Executive Summary

This project aimed to compare the effects of organic and synthetic fertilizers on the growth rate of tomato plants. Over a period of three months, we measured growth parameters including height, leaf size, and fruit yield to determine which type of fertilizer produces the most robust plants.

Project Objectives

- To determine which fertilizer type, organic or synthetic, more effectively promotes plant growth.
- To analyze the growth rate, health, and yield of tomato plants under different fertilizer treatments.
- To educate peers on sustainable agricultural practices through the findings.

Methodology

- **Experimental Setup:** Planted 30 tomato plants in identical conditions, with 10 plants each receiving no fertilizer (control), organic fertilizer, and synthetic fertilizer.
- **Data Collection:** Measured plant height, leaf size, and fruit yield weekly.
- **Statistical Analysis:** Used ANOVA to compare growth parameters among the different treatment groups.

Achievements and Results

- Plants treated with organic fertilizer showed a 20% greater growth rate and 25% more yield than those treated with synthetic fertilizers.
- Plants with synthetic fertilizer exhibited quicker initial growth but suffered more instances of leaf burn and lower overall fruit quality.
- Control plants had the slowest growth rate and least fruit production, validating the effectiveness of fertilizer use.

Challenges and Solutions

- **Challenge:** Variability in plant growth due to uncontrolled weather conditions.
- **Solution:** Utilized a greenhouse to minimize external environmental impacts on the experimental results.

Financial Overview

- **Budget Allocated:** \$100 (funded by a school grant)
- **Total Spent:** \$85, which includes costs for seeds, fertilizers, and measurement tools.

Conclusions and Recommendations

The results suggest that organic fertilizers are more beneficial for long-term plant growth and fruit production compared to synthetic options, which may cause

potential harm to plants. Future studies should look into the environmental impact of continuous use of these fertilizers on soil quality and ecosystem health.

Appendices

- **Appendix A:** Data Tables of Growth Measurements
- **Appendix B:** Details of Fertilizer Compositions
- **Appendix C:** Statistical Analysis Outputs
- **Appendix D:** Project Presentation Slides