



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

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Project Title Organic vs. Synthetic Fertilizers	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project is to determine if a synthetic fertilizer (miracle-gro) will make the plants grow at a faster rate than the organic fertilizer mixes. The goal of this project was to correlate pH, N, K and P levels within each soil mixture and determine how each soil / fertilizer mixture effects the height and stalk diameter growth of the plants over time. Additionally, pre-germination of the seeds was undertaken prior to planting to determine if this made a difference in plant growth.</p> <p>Methods/Materials Each organic fertilizer/soil mixture to be tested was generated by mixing 1 part of organic fertilizer with 3 parts of home garden soil. Each soil mixture was tested for pH, N, P and K at the start and at a 1 month time point during the experiment using a Luster Leaf Rapidtest soil test kit. In two separate experiments, seeds were either directly planted into the soil /fertilizer mixtures in individual pots; or pre-germinated prior to planting. Plant heights and stalk widths were measures at weekly intervals to generate growth curves.</p> <p>Results In experiment 1 where seeds were planted directly into the soil to germinate, the synthetic fertilizer soil mixture produced superior growth in both height ans stem thickness over a 3 month period. Of the organic fertilizer mixes, chicken manure produced the next highest growth and stem thickness. In experiment 2 where seeds were pre-germinated prior to planting in the early stages of plant growth the synthetic fertilizer produced superior growth in both stem and plant height. However at the end of the experiment the organic fertilizer mixes had plant and stalk thickness growth greater than the synthetic fertilizer. This may show that organic fertilizers slowly release their nutrients to the soil over time such that plants gain growth benefits longer.</p> <p>Conclusions/Discussion The results of my experiments have shown that synthetic, store bought fertilizers do indeed induce rapid growth among plants. Nevertheless, the natural and organic fertilizers we created and tested also produced healthy plants despite their early slower but steady growth rates. If organic farmers can supplement and condition their soils with natural fertilizers such as used in this experiment, then these fertilizers break down more slowly over time providing plants sustained nutrients over a longer time period.</p>	
Summary Statement In this experiment I showed that synthetic fertilizers and organic fertilizers produced different plant growth patterns over time.	
Help Received I designed, built, and performed the experiments myself with the help of my Mum and Dad	