



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2018 PROJECT SUMMARY**

<b>Name(s)</b> <b>Sofia S. Wallace</b>	<b>Project Number</b> <b>J2220</b>
<b>Project Title</b> <b>Acid Rain and the Food on Your Table</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> It is well known that the burning of fossil fuels causes the acidification of rain. Plant life makes up the base of our food chain and food supply. We must understand the relationship between the acidification of rain and the health of our food supply. This study aims to evaluate the quantitative and qualitative changes in plant growth and health that acid rain causes to the Sugar Ann pea plant. Additionally, I explored the relationship of acid rain and the taste of the Sugar Ann pea plant.</p> <p><b>Methods/Materials</b> Methods: In a controlled environment, 21 Sugar Ann pea plants were germinated. They were then divided into 7 groups of 3 plants. The plants were watered using pH levels ranging from 4.0-7.0 in 0.5 increments. Quantitative data (height) and qualitative (plant health) was then monitored over a 55 day growing period. The data was then analyzed using Microsoft Excel. A single blind pea taste study was completed at the end of the 55 day growth period. Materials: Sugar Ann pea seeds, regular water (pH 7.0), distilled white vinegar, electric pH detector, Microsoft Excel.</p> <p><b>Results</b> Plant growth in terms of height was optimal in the pH 5.0-7.0 (neutral) range. Average plant height at the end of the growth period was highest in the pH 6.0-7.0 (neutral) range. No trend was found in the time to pea pod formation vs. pH (productivity) during the growth period. When qualitative plant health characteristics were analyzed across the range of pH values, a strong relationship was found. Significantly earlier and more frequent leaf wilting and crumbling was observed in the pH ranges 4.0-5.0 (acidic). The occurrence of weak plant tendrils was also much more frequent in the more acidic samples. No identifiable trend was found when soil pH vs. taste was evaluated.</p> <p><b>Conclusions/Discussion</b> My experimental setup succeeded in demonstrating the threat that acid rain poses to our food supply. Even in my garage, with 21 plants and a 55 day growing period, my results showed the harmful effects of acid rain on the growth and health of my pea plants. The results of my experiment are conclusive evidence that the burning of fossil fuels which leads to acid rain will harm our plant supply. Leaders must make laws to reduce the burning of fossil fuels. This experiment can help to prove that these laws will protect our food supply.</p>	
<b>Summary Statement</b> The effects of acid rain on the growth and health of the Sugar Ann pea plant.	
<b>Help Received</b> Eric Wallace, who is a biology major and is my father, helped me to create my model and analyze my data.	