



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Rebecca I. Shane</b>	<b>Project Number</b> <b>J2032</b>
<b>Project Title</b> <b>Do Plants Want a Lemon? The Effect of Varying pH Levels in Acid Rain in Phaseolus limensis</b>	
<b>Objectives/Goals</b> How is Phaseolus limensis (lima bean) growth affected by the varying pH levels of the water it receives? This will help us understand the impact of acid rain on plant growth.	
<b>Abstract</b>	
<b>Methods/Materials</b> METHODS: <ol style="list-style-type: none"><li>1.Prepare each of the four plates, pouring appropriate liquid, with varying pH levels(ratio of lemon juice to water)over 15 seeds on each plate.</li><li>2.Continue program of pouring liquid on each sample for duration of 37-day program.</li><li>3.Measure mass of germinating seeds and take pictures weekly; measure germination by visible results.</li></ol> MATERIALS: Major Materials: 60 Lima Bean Seeds (Burpee Bush, Phaseolus limensis),ReaLemon 100% Lemon Juice from concentrate, graduated cylinder, balance scale, digital camera ,weights measured in grams, litmus paper	
<b>Results</b> The pH levels, germination rate and total mass of each sample were measured on a regular basis. As hypothesized, the germination and growth rates were directly related to the pH level of the acid (lemon juice) poured over the seeds. The higher the percentage of lemon juce, th lower the growth and germination rates.	
<b>Conclusions/Discussion</b> Phaseolus limensis growth was affected by the amount of acidity in the solution because the more acidic the solution, the slower the plant developed, as my hypothesis states. My data shows that lima bean seeds grow faster when only water is the only solution used. The conclusion I made was that the higher amount of acidity the lima bean seed received, the greater the negative impact on its growth.  From my experiment, you will see what effects acid rain will have on phaseolus limenses. This will prove the idea that stopping global warming, which will minimize acid rain.	
<b>Summary Statement</b> My project is about the effects acid rain has on phaseolus limensis seed growth and showing what we should do to stop acid rain from hurting our plants.	
<b>Help Received</b> My mother, Melanie Shane, for transporting me to get the materials required for my project and for helping me with my board. My father, Bill Shane, for helping me with my notebook.My Science Teacher, Mr. Nelson, for supplying the litmus paper, balance scale, the gram weights, and for encouraging me in	