



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Kyle M. Ivey	Project Number J1623
Project Title The Speed of Sprouting Seeds: Techniques for Seed Germination	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project was to determine which soaking solution would germinate bean seeds most effectively. As a higher percentage of seeds successfully germinate, crop yields will increase. More efficient farming will lead to conservation of resources, including water, energy, fertilizers, and labor. After researching different seed soaking methods, I hypothesized that Humic acid would germinate the bean seeds most effectively.</p> <p>Methods/Materials In order to decide what kind of seed to use in the experiment, I did a pre-study with corn, bean, and pea seeds, soaking ten of each in the liquids that would be used in the actual study. Bean seeds responded with the greatest amount of variation, so I used them for my experiment. I soaked three sets of 10 bean seeds in separate cups containing the following: distilled water, hydrogen peroxide, malt, humic acid/water, potassium nitrate/water, and fish emulsion/water. I kept the seeds damp with the solution. The seeds were in between coffee filters to keep them moist. I recorded the germination results over a four-day period.</p> <p>Results Both number of seeds that sprouted and how quickly they germinated determined the best soaking method. The seeds in the Humic acid began sprouting first, with those in hydrogen peroxide following close behind. All 30 seeds soaked in hydrogen peroxide sprouted by the fourth day; 23 sprouted in the Humic acid. In both the fish emulsion and the water, 17 sprouted. Although the seeds sprouted in the fish emulsion, by the fourth day mold had grown on them. There was no response from the seeds soaked in Potassium nitrate or malt.</p> <p>Conclusions/Discussion The results were not consistent with my hypothesis. Although seeds did germinate in the Humic acid/water solution, they did not do so as fully as in the hydrogen peroxide. My conclusion is that hydrogen peroxide is the best solution (out of the ones I used) for germinating beans.</p>	
Summary Statement The aim of the project was to identify an effective solution for germinating bean seeds.	
Help Received Advisor helped with Internet research and bibliography.	