



**CALIFORNIA STATE SCIENCE FAIR  
2007 PROJECT SUMMARY**

<b>Name(s)</b> <b>Kehly D. Kirk</b>	<b>Project Number</b> <b>S1708</b>
<b>Project Title</b> <b>Adding H(2)O(2) to the Mix: Effects of Hydrogen Peroxide on Germination and Plant Growth - A Two-Year Study</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Hydrogen peroxide can benefit plant growth in two major ways: 1) improved aeration; and 2) killing microorganisms that may be harmful to plant growth through its bactericidal/algaecidal/fungicidal qualities. This project was designed to test the effects of hydrogen peroxide on Champion Radish plant germination and growth. <b>Methods/Materials</b> 20 Petri dishes, filter paper, 3 Jiffy Easy Grow Greenhouse Kits, potting soil, tap water, hydrogen peroxide solution, and seeds were used. The Control Group and an Experimental Group of radish seeds were placed on filter paper in separate petri dishes (200 seeds) and planted in potting soil (200 seeds) in the greenhouse kits. The Control Group was watered with tap water as needed and the Experimental Group was treated with a maintenance concentration of hydrogen peroxide solution as needed. Petri dishes and greenhouses were checked for seeds that had germinated and data recorded daily. After most of the plants in the greenhouses had germinated, additional data including leaf color intensity, stem height, and overall appearance were collected weekly. In all, 2200 individual observations were recorded. <b>Results</b> Data indicated statistically significant better results in Experimental Group vs. Control Group in five (5) evaluation criteria: Petri dish germination; greenhouse germination; greenhouse germination time; leaf coloration; and overall health at the final reading (day 20). Three (3) evaluation criteria were found to not be statistically different between the Control and Experimental Groups: Petri dish germination time; average growth (cm); and growth rate (cm/wk). Descriptive Statistics (Mean, Std Dev, 95% Confidence Level); t-Test: Two-Sample Assuming Unequal Variances (Alpha=0.05); and z-Test: Two Sample for Means (Alpha=0.05) were used to perform the analysis. <b>Conclusions/Discussion</b> The hypothesis was only supported by the data in five out of eight evaluation areas. Further research should be conducted to determine optimal concentrations and long-term effects.	
<b>Summary Statement</b> This project is the second year of a two-year study designed to test the effects of hydrogen peroxide (H2O2) on plant germination and growth--in this case, Champion Radish.	
<b>Help Received</b> My parents purchased the materials for this project. My father assisted me in understanding the statistical analysis methods used and in preparing the charts and graphs that accompany this project.	