



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Michael Sinanian; Alexan I. Yerevanian	Project Number 22467
Project Title How to Prevent the Effects of Acid Rain	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to find out how acid rain affects a pond environment and to find methods of preventing its harmful effects</p> <p>Methods/Materials A large tank full of natural spring water was left open outside for one month. At the end of the month, 4 half-liter containers, each containing one Elodea plant, were filled with the water from the tank. 2 teaspoons of lemon juice were put into each of the containers to create acid rain like pH. 1 container was left as is, and in the others specific buffers (bases) were added. The containers were left outside. The macroscopic effects on the plant were recorded daily. Samples from each experimental condition were also examined for live and dead microorganisms, under the microscope using the Methylene blue technique.</p> <p>Results After a 10-day study, we found that the hydrated lime is the best material for preventing cell death and wilting of the Elodea caused by acidity. Pure ammonia damaged the plant to a certain degree. Baking Soda was not as effective as the hydrated lime.</p> <p>Conclusions/Discussion From these experiments we can conclude that acidity is a cause of microscopic and macroscopic damage to plants and living organisms in a pond and that this damage can be prevented and controlled. Correcting the pH, however, was not sufficient and buffers offered different levels of protection at equivalent pH correction. From our experiments we can conclude that hydrated lime was the best in preventing microscopic and macroscopic damage to life in the pond.</p>	
Summary Statement What can be done to prevent the damage caused by acid rain in a pond environment?	
Help Received Used lab equipment at school under the supervision of Mr. Kevork Agopian; Mother helped get the materials and put the board together; Father helped in experimental design and analysis; Mr. Raffi Svadjian helped with statistical analysis; Brother gave critical advice	