



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

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| <b>Name(s)</b><br><b>Leah M. Ostermann</b>   | <b>Project Number</b><br><b>J1021</b> |
| <b>Project Title</b><br><b>Acid Rain: A Good Thing?</b>  |                                       |
| <p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b><br/>Acid rain changes soil chemistry by leaching plant nutrients in the form of salts from the soil and lowering the soil pH. Soil salinity is the salt content of soil. As soil salinity increases, plants cannot grow, like in playas or dry lakes. The objective of this experiment is to determine if acid rain can leach salts from different soils to help plants grow. My hypothesis is that soil from China Lake playa will contain the most salts and the salts will leach the most, so that plants can grow.</p> <p><b>Methods/Materials</b><br/>Four soils were tested: 1) China Lake playa soil; 2) Mirror Lake playa soil; 3) desert soil; and 4) potting soil. Each soil (360 mL) was placed in a coffee filter. Water (960 mL) was poured over each soil. After the water filtered through the soil, a sample of each soil was tested with a soil test kit that measured plant nutrients: nitrogen, phosphorous, and potassium. Soil pH was also measured with pH paper. Then water &amp; vinegar (960 mL) at pH 2.5 (acid rain) was poured over 360 mL of each soil using the coffee filter. After the water/vinegar filtered through the soil, a sample of soil was tested for pH &amp; plant nutrients. Each soil was also tested for pH &amp; plant nutrients before water or water/vinegar were poured over them.</p> <p><b>Results</b><br/>Water poured over potting soil does not change soil pH of 6 and amount of plant nutrients. Vinegar/water lowers soil pH from 6 to 3.9 and nitrogen &amp; potassium. Water poured over desert soil lowers soil pH from 7.3 to 6.1 and lowers plant nutrients. Vinegar/water lowers soil pH from 7.3 to 3.5 and only lowers nitrogen. Water poured over Mirror Lake playa soil does not change soil pH of 8 and lowers nitrogen &amp; phosphorous a little. Vinegar/water lowers soil pH from 8 to 7.2 and lowers nitrogen &amp; phosphorous. Water poured over China Lake playa soil changes soil pH from 10.3 to 10 and only lowers nitrogen a little. Vinegar/water lowers soil pH from 10.3 to 8.3 and does not change plant nutrients.</p> <p><b>Conclusions/Discussion</b><br/>My hypothesis was not proven. Acid rain has little change on China Lake soil. The pH dropped but not to the ideal soil pH of 6 (potting soil) and plant nutrients did not change. The results were probably because China Lake soil salinity and pH were very high to start. The best results for acid rain was for Mirror Lake soil, probably because the soil salinity and pH were not too high to start. Water also worked well with desert soil and potting soil.</p> |                                       |
| <b>Summary Statement</b><br>My project determines if acid rain can be used in a good way to help plants grow in places, like playas, where the salts are too high for plants to grow.  |                                       |
| <b>Help Received</b><br>My Dad helped with the original idea and setup. My Mom helped me do the experiments and look at the data.  |                                       |