



**CALIFORNIA STATE SCIENCE FAIR  
2012 PROJECT SUMMARY**

<b>Name(s)</b> <b>Alexander B. Vu</b>	<b>Project Number</b> <b>J0816</b>
<b>Project Title</b> <b>Saturated Soil</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My objective was to determine the effects of different soil amendments on the absorption and retention rates of water in the soil. I used six different amendments: volcanic ash, gypsum, hydrogen peroxide, aluminum sulfate, nitrogen-phosphate-potash fertilizer, and clay. <b>Methods/Materials</b> This experiment was over a period of 15 days. On day -15 I laid out 21 bowls of 100 g of soil and designated three for each amendment and three for the control. Starting on this day and every three days afterwards until day 0, I added hydrogen peroxide to the appropriate bowls. On day -7 I added all the other amendments to their respective bowls, except for the aluminum sulfate, which was added on day -2. The maximum amount of each amendment was added without rendering the soil useless, and it was added over the amount of time, determined by research, during which it would be the most effective. On the day of the experiment, at time zero, water was added to the amended soil until it was saturated and the amount added was recorded. One hour later water was again added to the soil until it was saturated and this amount was also recorded. The latter determined the amount of water that had come out of the soil. This whole process was repeated twice more. <b>Results</b> I discovered that the soils absorbed water in this order: clay, volcanic ash, fertilizer, control, aluminum sulfate and gypsum, and hydrogen peroxide. I also discovered that the soils retained water in this order: clay, volcanic ash, fertilizer, aluminum sulfate, gypsum, hydrogen peroxide, and control. <b>Conclusions/Discussion</b> I concluded that some amendments increased both the absorption and retention rates of water, while others only increased the retention rate. Clay and volcanic ash increased both the absorption and retention rates significantly, whereas the fertilizer increased the absorption and retention rates by only a small amount. All the other amendments were found to decrease the absorption rate but increase the retention rate by a lesser amount than the fertilizer. The applications of this project are twofold. First, this project determines the amount of water that soil with certain amendments would need so that it would not be over-watered or under-watered. It also determines what amendments cause soil to absorb more water than unamended soil so that they could be used in a garden. Through research, I expanded my knowledge of soil classification.	
<b>Summary Statement</b> My project is about the effects of different soil amendments on the absorption and retention rates of water in soil.	
<b>Help Received</b> None	