



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Rebecca C. Vincent	Project Number J1732
Project Title The Effect of Growing Medium on the Height of Paperwhite Narcissus Flowers	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals When Paperwhite Narcissus bulbs are flowering the stem is often so tall that it can't support the flower and it falls over. My goal is to find a growing medium that makes the stems shorter so that the plant will stay upright when flowering. Based on a Cornell University experiment, my hypothesis is that watering the plant with some alcohol will make the stem shorter, but too much alcohol will harm the plants. Cornell researchers thought that this effect was caused by water stress, so I also hypothesize that giving a plant less water will make it shorter. I also hypothesize that the stem of the plant will grow even taller if grown in a nitrogen rich growing medium.</p> <p>Methods/Materials To test my first hypothesis, in experiment 1, I grew Narcissus bulbs in rocks and liquid. I used 5 different liquid solutions: plain water (control), 5% alcohol (from wine and from gin), 10% alcohol, and 15% alcohol. To test my second hypothesis, in experiment 2, I grew Narcissus bulbs in potting soil. One set of bulbs was watered normally (control) and a second set was watered with half as much water. To test my third hypothesis, in experiment 3, I planted one set of bulbs in 50% organic coffee grounds and 50% soil. The control was the same as in experiment 2. I measured the height of the plants regularly.</p> <p>Results In experiment 1, my hypothesis was correct. The plants with 5% alcohol were shorter and flowered normally. Higher concentrations lead to small or no flowers. Wine, which also had sugars in addition to alcohol, caused mold, and small or no flowers. In experiment 2, my hypothesis was also correct. Plants watered less had shorter stems but still flowered normally. In Experiment 3, my hypothesis was wrong. There was no significant difference in height between Paperwhites grown in soil and those grown in soil and coffee grounds.</p> <p>Conclusions/Discussion My experiment successfully confirmed the Cornell result that small amounts of alcohol in the growing medium produces shorter plants. Cornell had not yet conducted an experiment to prove their hypothesis that this effect was caused by water stress. My experiments confirmed that simply watering the plants less also produced shorter stems and normal flowers. My experiments also showed that there wasn't much difference between growing the plant in soil, soil with extra nitrogen, or just water. This may be because the plant gets all the nutrients it needs from the bulb.</p>	
Summary Statement In my project I wanted to find a way to make the stems of Narcissus flowers shorter; I compared adding alcohol to their water and watering the flowers less.	
Help Received Parents helped get supplies and mother supervised mixing the alcohol solutions and taught me how to make the graphs in excel.	