



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

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| Name(s) Luke C. Penn-Hall | Project Number S1612 |
| Project Title The Effects of Three Common Weather Conditions on a Plant's Rate of Transpiration | |
| Abstract Objectives/Goals The objective of this experiment was to test the effects of three common Southern California weather conditions, humidity, wind, and Santa Ana wind, on a plant's rate of transpiration. Methods/Materials This experiment required several Rose of Sharon shoots, the construction of a potometer for which I needed: one glass pipette, one metric ruler, one stand, and one 12 inch length of flexible plastic tubing. I also required one fan, one blow dryer, one spray bottle and one plastic bag. The Rose of Sharon shoots were placed into the potometer. I then made sure that the seal was airtight. Each shoot was subjected to one of the weather conditions for a period of 5 minutes with the amount of water loss in centimeters recorded every minute. The data was collected and averaged. The results were put through a formula which converted the measurements from distance in centimeters to volume in mm cubed. Results The results of the experiment supported my hypothesis that the weather conditions would alter the plant's rate of transpiration. The wind experiment had the lowest rate of transpiration, only 282.75mm cubed per five minute period. The control and humidity experiments both had the same the same rate of transpiration, 329.87mm cubed. And the Santa Ana, or "hot" wind, experiment had the highest rate of transpiration, 471.24mm cubed. Conclusions/Discussion Transpiration is an important life process because it is a necessary step in the photosynthetic process. Knowing how much water a plant transpires under certain conditions is invaluable in times of drought and water conservation. This experiment could also be expanded to help decide which plants would best survive in an arid or demanding climate for terraforming purposes. The test plant, a Rose of Sharon, would work well in Southern California. It would require a little more water during the Santa Ana winds. It would conserve water during the normal, dry winds. And it is well suited to this area's climate. | |
| Summary Statement The point of this project is to find the effects of three common weather conditions on a plant's rate of transpiration. | |
| Help Received My mother helped me design the board and took photographs. | |