



CALIFORNIA STATE SCIENCE FAIR 2008 PROJECT SUMMARY

Name(s) Carla L. Valladares	Project Number S1724
Project Title The Effects of Temperature on the Xylem of Tomato Plants	
Objectives/Goals The objective of this experiment was to see if temperature does affect the size of the xylem of plants, especially Roma Tomato plants. Methods/Materials 6 Roma Tomato plants; 6 planting pots; 1 bag of planting soil; 25 mL beaker; 1000 mL beaker; Blue dye; Water; Ice; Heat Lamp; Thermometer; Daily journal; Pen; I placed six pairs of tomato plants in six different areas, each with different temperatures. The six different temperature areas were: under a heat lamp, in the shade, in direct sun, in a refrigerator, in a freezer, and in ice. I watered the plants everyday with 300mL of water that was dyed blue with 25mL of blue dye. I continued this for three weeks. After three weeks I cut a piece of each tomato plant 2 inches from the root and examined the xylem under the microscope. I then went up the stem 5mm and cut another piece. I did this in 5mm increments. I then measured the size of the xylem and compared them to see the effect that temperature had on the plants. Results After examining the 6 different plants I learned that temperature does affect the size of the xylem of the tomato plants. The tomato plants that were put in heat tended to have larger xylem. While the plants that were in the refrigerator tended to have xylem that were natural size. The tomato plants that were put in freezing temperatures had xylem that shrunk because they tended to freeze. Conclusions/Discussion In conclusion, I found that my hypothesis was correct in that temperature did affect the plants and the way that their nutrients were carried through their xylem. From this experiment I learned that the climate of the environment that a plant is in affects the plant positively or negatively. For the tomato plants that were in the hotter weather the blue dyed water tended to travel less than the plants that were put in colder climates. The dye seemed to move faster in the cold weather, because in the hot environments the plant dried out. In the colder environments the plants were able to stay saturated and took in the blue dyed water better than the plants in hot environments did. The xylem could be seen easier because the blue dyed water. Seeing as the xylem carries water all over the plant, it makes sense that the xylem was dyed blue by the water. The plants in hotter environments had visible xylems, but they were not dyed blue because the plants were too dried out to have enough of the blue water go through the xylem.	
Summary Statement My project is about observing the effects of extreme temperature on the xylem of a tomato plant.	
Help Received Teacher helped me narrow my topic; Mother helped me make display board	