



CALIFORNIA STATE SCIENCE FAIR 2004 PROJECT SUMMARY

Name(s) Megan Lynn Lopez	Project Number J0916
Project Title Minimizing Nitrogen Pollution and Conserving Water	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Nitrogen pollution in the environment results mainly from the over-use of nitrogen-based fertilizers in agriculture. Crops often cannot absorb all the nitrogen added. During irrigation, this excess nitrogen, which exists in the soil as nitrate, leaches down through the soil and contaminates ground water supplies, lakes, and rivers. Farmers can reduce nitrate leaching by limiting the amount of water they use. By monitoring the moisture content of the soil and only applying enough water to reach adequate levels of moisture, they can both minimize nitrate leaching and conserve water. Nitrate serves as plant food and its availability determines soil fertility. Nitrates are created in the soil through nitrification. Nitrification occurs when nitrifying bacteria converts ammonia fertilizer (or other naturally occurring ammonia) into nitrites and then nitrates. This experiment tries to determine if and how limiting the amount of water applied (or the soil moisture) will affect the nitrification process. The experimenter hypothesizes that the amount of moisture in the soil will affect the nitrification process.</p> <p>Methods/Materials The experimenter set up 6 potted plants. Measurements showed that all pots contained the same initial levels of nitrate. The experimenter then fertilized each of the plants with 10 grams of ammonia sulfate and proceeded to carefully monitor and control the soil moisture in each pot. The experimenter kept two pots dry, two pots moist, and two pots very moist. After a ten-week period, the experimenter measured the final nitrate levels in each pot.</p> <p>Results Initial nitrate measurements showed that the soil nitrate levels in all the pots were about the same at the start of the experiment. After 10 weeks of controlling the soil moisture in each of the pots, the experimenter measured the final nitrate content of the soil in each pot and found that the pots with the higher moisture content contained greater levels of nitrates.</p> <p>Conclusions/Discussion The results of the experiment support the hypothesis. The moisture content of the soil does appear to have an affect on the nitrification process. The experiment shows that soils containing the higher moisture levels also showed the greatest increase in nitrate concentration. Therefore, keeping the soil moist will result in additional plant nutrients (more nitrate).</p>	
Summary Statement My experiment tries to determine if and how soil moisture affects nitrification.	
Help Received My dad helped me research the project and helped me to understand the material.	