



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

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Project Title Fertilizer's Effect on Scenedesmus Growth	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this experiment is to find out the effects that different amounts of the essential elements found in fertilizer have on the growth of algae. This ties into the use of aquaculture of algae to create biofuel and creation of dead zones by the eutrophication of oceanic environments. If I vary the amounts of the nutrients in the fertilizer used to grow algae, then the algae will grow best in the fertilizer with the combination of the medial amount of nitrogen, phosphate, and iron. The fertilizer with plenty of nitrogen and iron lacks an abundant amount of phosphate. The fertilizer with plenty of phosphate has less nitrogen and completely lacks iron. Therefore, the fertilizer with a medial amount of all three nutrients will grow the best.</p> <p>Methods/Materials This experiment requires two fertilizers, beakers, Scenedesmus algae cultures, a microscope, and pipettes. First pour 100mL of water into 6 beakers and add 100mg of fertilizer. Vary the amounts of fertilizer such that one beaker has no fertilizer (control) and the rest have differing amounts of the two fertilizers such that the total fertilizer is still 100mL per beaker (100mg/0mg, 80/20, 50/50, 20/80, 0/100). Each day, prepare four slides for each beaker and count the number of cells per 4 square millimeter area using a 100X magnification microscope.</p> <p>Results The control grew 4.5 cells per 4 square millimeter area and tied with 100/0 fertilizer (nitrate, most phosphate, no iron). 0/100 grew 6.5 cells per 4mm area (nitrate, most iron, no phosphate). 20/80 and 80/20 fertilizers also happened to tie with a growth of 7.0 cells per 4mm area. 50/50 fertilizer (medial nitrate, phosphate, and iron) grew the best with a growth of 13.0 cells per 4mm area.</p> <p>Conclusions/Discussion My hypothesis was accepted because this experiment demonstrated that the algae with the medial amount of all three of the essential nutrients iron, nitrate, and phosphate had the greatest increase in cells per unit area. Some possible problems with the experiment could be there was too much amount of the essential nutrients for the algae. Also, tap water was used in this experiment and not distilled water, so there could be some dissolved minerals in the tap water that the algae could have reacted to. It could be possible that some of the algae cultures could have been duds or could have been damaged during shipping.</p>	
Summary Statement This experiment tests the effects of the amount of the nutrients iron, nitrogen, and phosphate in fertilizer on Scenedesmus algae growth.	
Help Received Parents bought supplies, parents drove me to collect materials, and used a microscope from Villa Park High School lent to me by Mrs. Walburn.	