



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> <p align="center"><b>David B. Tannin</b></p>	<b>Project Number</b> <p align="center"><b>J1625</b></p>
--	---

**Project Title**  
**Hydroponics: An Interpretation in Cultivation**

**Abstract**

**Objectives/Goals**  
 To find out whether hydroponics is a better form of cultivation and should be used to improve many aspects of agricultural farming.

**Methods/Materials**  
**MATERIALS:** bucket tape, 1 gallon plastic jug with cap, 6 dwarf tomato plants, 1 tbs. of plant fertilizer (5-10-5), 1 tsp. Epsom salt, 3 7oz. Paper cups, 1 tsp. of ammonia, paper towels, 3 pint glass jars, tin foil, pen, tap water. **PROCEDURE:** Fill bucket with tap water, let water sit to evaporate chlorine. nutrient solution: Fill milk jug 1/4 with water. Add fertilizer, Epsom salt, and ammonia. cover jug and shake. Mix well. Fill rest of way. Take a tomato plant out of pot. Gently take soil off. Don't damage roots. Then rinse them in water to remove all dirt. Cut hole in bottom of paper cup to allow 1/4 of roots to stay in cup. Support plant with paper towel. Put cup inside jar. Mark bottom of cup on jar. Add nutrient solution to mark. Keep solution at mark during experiment. Place cup in jar. Put tin foil on jar to prevent algae. Repeat steps 4-11 for two other plants. Put in direct sunlight. Set three other tomato plants in pots in same place as hydroponicums for comparison. Water as needed, with tap water. Measure plants, record observations

**Results**  
 Plant Growth in Milimeters  
                     Hydro A Hydro B Hydro C Reg 1 Reg 2 Reg 3  
 Average Total Growth 232 271 312 214 156 100  
 The Hydroponic plants were much healthier, and the leaves were much greener and lusher. There were more flowers and it produced more fruit. Hydroponics turned out to be superior.

**Conclusions/Discussion**  
 The plants were much healthier and thrived in a hydroponic system while the other plants were not as healthy. This was due to malnutrition from the tapwater. I learned that mold is fatal to plants when the cup and roots got moldy. Hydroponics though, has many problems. It is expensive for real systems and if defective, the plants can die. After one day of forgetting to refill the hydroponics system, the plant started to wilt. This shows that the plants need help retaining moisture. Lastly, I found out that hydroponics has a greater output than other plants. Even though the starting expense seems greater, you still do not need to buy weed killer and sometimes pesticides. Less work is put into these plants and more produce is obtained. Overall, Hydroponics is a more useful form of cultivation and can increase productivity making a large benefit. If used more in the future, it could solve many world problems.

**Summary Statement**  
 My project is about hydroponics, and how it compares to growing without fertilizer and just tap water.

**Help Received**  
 Mother helped buy supplies, gave moral support, helped format some charts.