



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Jenna R. Murphy	Project Number J1016
Project Title Determining the Cost Efficiency and Water Conservation of Various Irrigation Methods	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective was to determine which irrigation method would conserve the most water and is the most cost efficient.</p> <p>Methods/Materials I used four different kinds of irrigation methods to grow oats for my experiment: sub-surface tray, sub-surface drip, sprinkler (traditional), and surface drip. A separate container was used for each method. I germinated oat seeds and planted ten in each of the four containers. I used a moisture sensor to know when to water. Using the particular irrigation method for each container, I added one liter of water only if the moisture sensor registered a 4 or below. At the end of ten weeks I added up the amount of water used and compared each system. From my research I know what each of the irrigation methods costs per acre for materials, labor, and water.</p> <p>Results I found that the sub-surface tray conserved the most water, and the sprinkler system used the most amount of water. The sub-surface tray conserved ten more liters than the sprinkler system. The traditional drip and sub-surface drip averaged 12 liters. The sprinkler system was the most cost efficient and the sub-surface tray system costs the most. The sub-surface tray cost \$82,298.00 per acre just to start up. The traditional irrigation system only cost \$466.00 per acre. The sub-surface drip cost \$1,000.00 and the surface drip cost \$800.00 to start up.</p> <p>Conclusions/Discussion I observed the roots on the sub-surface tray plants were as much as four times as long as the other three trays. I believe this is because the roots had to grow down to the water making the plants healthier. Through this experiment I furthered my knowledge of irrigation systems. I learned that even though there are better systems for conserving water, it wouldn't be feasible for growing crops. I learned that the sub-surface drip irrigation, though not the least expensive system, conserved more water than the traditional sprinkler and the surface drip systems and gave a higher yield than the traditional sprinkler and the surface drip systems.</p>	
Summary Statement We need to get as much benefit from each liter of water we remove from the earth as we can, while finding the most cost efficient system for those countries that have limited financial resources.	
Help Received My parents helped me measure the plants and my mother helped me glue my reports to my board.	