



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY**

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Project Title Can an Organic Compound like Crude Glycerin Improve the Water Holding Capacity of Soil?	
<p style="text-align: center;">Abstract</p> <p>Objectives Can an organic compound like glycerin improve the water holding capacity of soil.</p> <p>Methods Use 8 x 1-gallon plant containers filled with a sandy loam soil to demonstrate the movement of untreated irrigation water against irrigation water treated with 2% glycerin per volume. (10 ml of glycerin in a 500 ml of irrigation water). Use oversized drip trays to collect irrigation water that was applied to the containers and that have moved through the soil. 4 containers in each treatment are used as replicates to calculate a statistical difference between the 2 treatments. A calibrated measuring jug is used to measure the amount of water retained in the drip trays and documented. The documented data of the 4 replicates are added together and divided by 4 to calculate the average of each treatment to statistically compare the 2 treatments. Containers and the oversized drip trays are marked with a permanent marker. (4 containers and drip trays marked A1 to 4 and 4 containers and drip trays marked B1 to 4). Calculations: 1. $(A1 + A2 + A3 + A4) / 4 =$ average of treatment A. 2. $(B1 + B2 + B3 + B4) / 4 =$ average of treatment B. 3. Calculate the average % difference by subtracting the lowest average treatment from the highest average treatment value.</p> <p>Results The irrigation water treated with glycerin improved the water holding capacity of the soil by 46% when compared with the untreated control of irrigation water alone. Treatment B had an average of 66 ml of water retained in the soil treated with the irrigation water and added glycerin. Treatment A, the control had an average of 112 ml of water retained in the soil treated with only water.</p> <p>Conclusions The irrigation water treated with glycerin improved the soil water holding capacity of the soil by 46%. The use of glycerin could mean less irrigation intervals and less water are needed for growers to grow a crop. A significant saving of up to 40% and more was observed in this study and soil type. This could have a huge economic implication for farmers growing crops as it will save them a lot of money on irrigation water and will contribute to nature conservation in a quest to save our planets most important resource, water.</p>	
Summary Statement To determine if less water will move through the soil profile when treated with glycerin by improving the water holding capacity of soil.	
Help Received I conducted the experiment myself.	