



CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

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| Name(s) Emily Y. Banno | Project Number J1001 |
| Project Title What Is the Best Mulch Material to Prevent Soil Water Evaporation? | |
| <div>Objectives/Goals California is facing a severe drought. Water is an important resource that needs to be conserved. This study examined the question of which mulch material covered on soil conserved the most water.</div> <div>Abstract The method to determine which mulch material conserved water the best was to measure which material best prevented soil water evaporation. There were eight mulches tested, four organic mulches: wood, eggshells, moss, pine needles, and four inorganic mulches: small rocks, big rocks, rubber, and fabric. Each mulch covered containers containing 350.0 grams of soil and 300.0 grams of water. The control was the container with no mulch. Each container weight was measured everyday over a one week period to determine how much weight was lost. The total weight loss over the one week period was due to soil water evaporation. The experiment was repeated three times. Also, temperature and dew point data were recorded daily. They were used in the simplified version of the Penman Formula, which is used for calculating the evaporation rate of open water. The Penman Formula was slightly modified and used in this experiment for soil water evaporation.</div> <div>Methods/Materials The method to determine which mulch material conserved water the best was to measure which material best prevented soil water evaporation. There were eight mulches tested, four organic mulches: wood, eggshells, moss, pine needles, and four inorganic mulches: small rocks, big rocks, rubber, and fabric. Each mulch covered containers containing 350.0 grams of soil and 300.0 grams of water. The control was the container with no mulch. Each container weight was measured everyday over a one week period to determine how much weight was lost. The total weight loss over the one week period was due to soil water evaporation. The experiment was repeated three times. Also, temperature and dew point data were recorded daily. They were used in the simplified version of the Penman Formula, which is used for calculating the evaporation rate of open water. The Penman Formula was slightly modified and used in this experiment for soil water evaporation.</div> <div>Results In my experiment, the #Small Rocks# mulch conserved the most water because it showed the lowest water loss average compared to the other materials for the three trials. The mulch, #Big Rocks# was second best and the mulch, #Rubber# was third best.</div> <div>Conclusions/Discussion The results of my experiment did not support my hypothesis. I felt that the mulch #Rubber# would do the best. Instead, the mulch, #Small Rocks,# had the least soil water evaporation. I chose the #Rubber# mulch because it is tough, elastic, water-repellent, stable, and can withstand different temperatures. The mulch, Small Rocks,# might have been best because little gaps can be filled in easily while other mulches probably had larger gaps in between the material, allowing more evaporation. Even though my hypothesis was incorrect, the mulch #Rubber# was still a good choice because on average it was third best in preventing soil water evaporation.</div> | |
| Summary Statement This experiment studied which mulch material conserved the most water in soil by measuring which material prevented soil water evaporation the best. | |
| Help Received My parents helped with material purchase and board display. | |