



CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

Name(s) Kaanthi C. Pandhigunta	Project Number J2025
Project Title Super Absorbent Soil: The Effect of the Addition of Polyacrylamide to the Water Retention of Soil	
<div>Objectives/Goals Cross-linked polyacrylamide, a hydrogel, has the ability to absorb water up to 800 times its own weight. The purpose of this experiment was to determine the efficacy of polyacrylamide on the water retention in soil.</div> <div>Abstract 5g of polyacrylamide crystals were mixed with soil and filled into pots whose overall weight was 400g. Three sets of experiments were conducted with 200g, 300g and 500g of water added to three different sets of pots filled with soil and polyacrylamide mixture. The pots were left in an open room and their weights were recorded on a daily basis for a period of 2 weeks. Then, the original weight was subtracted from the current weight to determine the amount of water still in the soil.</div> <div>Methods/Materials The water retention in pots with 200g and 300g of water added was not very different from that of the control. However the water retention in pots added with 500g of water was significantly higher than that of the control. This proves that a judicious mixing of polyacrylamide with soil can help retain excess water and can keep the soil moist for a longer duration of time by slowly releasing the stored excess water.</div> <div>Results Though there are demonstrable benefits with respect to water retention, the long term environmental effects of use of polyacrylamides must be studied further, because the monomer of polyacrylamide is acrylamide, a deadly neurotoxin, and the biodegradability is uncertain. The addition of polyacrylamide can improve agriculture in areas of excess rain, as well as areas of drought. Polyacrylamide-enriched soil can help agriculture in parts of the world with too much rain by absorbing all the excess water that would normally drown the plant. Later, the polyacrylamide will release the water when the plant needs it, by the process of osmosis. In areas afflicted by drought, the farmer will only have to water his/her plants heavily once or twice during the crop year with polyacrylamide-enriched. The plant will absorb the water it needs at the moment, and the polyacrylamide will absorb the rest of the water that would normally evaporate or run off, releasing it later on as the plant needs it.</div> <div>Conclusions/Discussion</div>	
Summary Statement This purpose of this project was to determine the efficacy of polyacrylamide on the water retention of soil.	
Help Received Father helped order materials; Parents helped put the soil into the pots;	