



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Zachary A. Lute	Project Number S0807
Project Title Study on Anionic Polyacrylamides	
Abstract Objectives/Goals This experiment was conducted in order to find the effects of different concentrations of two anionic Polyacrylamides, Amber 1200 and Stockopam, on water infiltration and flocculation in Chualar sandy loam soil. Methods/Materials In order to determine this, two polyacrylamides (PAMs) were presented from different companies and the powder was mixed with water to form a diluted solution for the experiment. In order to dilute the polyacrylamides from 100ppms to 10, 5, and 1ppm, the equation $C(1) \times V(1) = C(2) \times V(2)$ was used. Chualar sandy loam soil was placed in the small column of Merit Burettes and the tall column was filled with the polyacrylamides Amber 1200 and Stockopam in different concentrations. Measurements of how fast the two liquids passed through the tall column to the short column and into the soil were done in 5cm increments. The procedure for measuring the flocculation of run-off was then conducted. For this, 7 small cylinders were filled with the soil and the solutions were placed into the cylinders and they were shaken and let sit before the solution was removed and placed into a machine called a UV/Vis Spectrophotometer that shot light through the center of the cell and measured the suspended sediment. Results The results indicate that Stockopam was much more effective in flocculating the sediment and only minimally reducing water infiltration. More research is being done but is not yet conclusive. Stockopam and Amber 1200 at all of the concentrations are in the process of being tested to see their effect on the flocculation of Phosphate and Nitrates. Conclusions/Discussion Stockopam ended up reducing sediment significantly at the low concentration of 1ppm (Fig.4) while only slightly hindering water infiltration by running at only 4min and 20sec slower than fresh tap water (Fig.2,1). So the hypothesis was partially correct because one of the anionic polyacrylamides increased flocculation and only slightly reduced infiltration in the sandy loam soil. The other, however, only greatly impaired the infiltration and had little effect on the flocculation rate.	
Summary Statement The effects of the molecule Polyacrylamide on water infiltration and the reduction of sediment, phosphorus, and nitrates in tailwater.	
Help Received The facilities at the USDA were used along with their lab equipment under the supervision of Dr. Husein Ajwa and Dr. Susane Klose from UC Davis.	