



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Steven M. Tugas	Project Number 22344
Project Title How Effective Are Polymers in Keeping Pre-Emergent Active in Soil?	
Abstract Objectives/Goals The goal was to see if the polymers would help make the Pre-Emergent become more active and last longer. Methods/Materials I put potting soil into nine flats. Then I mixed polymer with water. The polymer was then put into Group C potting soil. I mixed one teaspoon of pre-emergent into 1 gallon of water. That was put into a 16 ounce spray bottle. 8 ounces was sprayed into both Group B and C. After two months, I planted ryegrass seeds into Group A,B,and C. I sprayed water once a day until germination occurred. Results Results showed that it took 3 days for Group A (potting soil only) to germinate. It took 7 days for Group B (potting soil and pre-emergent) to germinate. It took 13 days for Group C (potting soil,polymer,and pre-emergent) to germinate. The grass of Group A would make a perfect lawn because it was really green and tall. The grass of Group B was very scarce. Group C barely had any grass at all. The grass was very sick looking and it had a yellow and brownish color. Conclusions/Discussion The pre-emergent and polymer had the greatest effect on Group C. My hypothesis was correct. My hypothesis stated that Group A would have the most growth and Group C would have the least amount of growth. This project would help get a healthier environment and less manual labor.	
Summary Statement My project is to investigate if polymers would help pre-emergent last longer and become more active in soil.	
Help Received Mother helped organize the board and father advised me with the chemicals.	