



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Susan M. Pasternak	Project Number J1428
Project Title Nature vs. Nature: Eradicating Arundo donax with Allelopathic Leaf Extract Treatments	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Arundo donax is an invasive, non-native species that is a natural threat to riparian habitats throughout the United States. Currently, herbicides are the primary method of eradication with ineffective, expensive, and harmful final results. The objective of this study was to use a natural method of allelopathic leaf extract treatments to eradicate Arundo donax in an environmentally-friendly and cost-effective manner.</p> <p>Methods/Materials Fallen plant material of Eucalyptus globulus, Nerium oleander, Pinus contorta, and Quercus agrifolia were boiled with tap water for one hour at 100° Celsius and allowed to steep for 48 hours, forming a 27% extract. Arundo donax was cut down to a height of approximately 8 centimeters. The various leaf extract solutions were then poured into the hollow nodes of the canes and cooked plant material was scattered throughout the plot. Residual growth was monitored and recorded. The most effective treatment was then re-tested for accuracy throughout a period of approximately two and a half months.</p> <p>Results By using the leaf extract treatments, the percentage of eradication follows: 60% of Quercus agrifolia, 77.7% of Pinus contorta, 83% of Eucalyptus globulus, and 100% eradication of Nerium oleander. All testing sites had inhibited growth rates when compared to the control. Subsequent experiments on Nerium oleander had similar results with some variations.</p> <p>Conclusions/Discussion Experimentation of allelopathic leaf extract treatments supported the objective of discovering a natural solution to eradicate Arundo donax. Astonishing results indicate that Nerium oleander extracts were effective in achieving this goal. Studies such as this increase public awareness that natural alternatives to herbicides exist. Using nature to fight nature will become the way of the future in order to preserve the quality of life for all living creatures.</p>	
Summary Statement The use of allelopathic leaf extract treatments, namely Nerium oleander, is a natural, environmentally-friendly, and inexpensive method to eradicate Arundo donax.	
Help Received Reference materials were obtained from the Santa Barbara Botanical Gardens. Shinichi Asao, a UCSB intern, gave a brief review of the scientific method. Mother provided transportation to sites.	