



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> <b>Ivan Jimenez; Josh Woods</b>	<b>Project Number</b> <b>J1412</b>
<b>Project Title</b> <b>The Alleopathic Effects of Extracts from Umbellularia californica and Aesculus californica on the Grass Lolium perenne</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> To create an herbicide that will kill rye grass made from seeds and leaves of plants with known allopathic effects. To find an organic method of weed control to replace the use of the herbicide Round-Up at our school.</p> <p><b>Methods/Materials</b> Bay leaves (<i>Umbellularia californica</i>) and buckeye fruits (<i>Aesculus californica</i>) were made into separate extracts using a blender and ring-stand filtration system. Two different concentrations, 100% and 50% of each herbicide were made and applied evenly with a spray bottle to established plots of rye grass. A second treatment was done using the herbicides as a soil treatment prior to planting the rye grass seeds. A control group using water in place of the sprayed herbicide was used in each treatment and trial. Data was collected using growth, color of grass and turgor of the plants as indicators of the health of each plot.</p> <p><b>Results</b> The full strength herbicides were successful in killing 100% of the rye grass, when sprayed directly on the plants. The control plots of rye grass continued to flourish during each treatment and trial. The soil treatments had less effect on the rye grass in the four trials, only slowing the germination by one day and the growth of the plants by about 20% in comparison to the control group.</p> <p><b>Conclusions/Discussion</b> California bay and California buckeye are species that have known allopathic effects on other organisms. Plant growth is sparse under bay trees and buckeye seeds have been known to stupefy fish and retard the growth of competing plants. These two plants were chosen to make the herbicides in an attempt to formulate an organic herbicide to replace Roundup that is being sprayed at our school. The data on the leaf spray treatments showed the established plants changing in color from a healthy green to a definitive dead (crispy) brown one week after treatment with the 100% buckeye extract and the same results with the 100% bay extract 9 days after the initial treatment. The 50% extracts had similar effects on the established grass but with an increased time span to kill the grass. The soil treatments, had some effect in the four trials in that it took one day longer for the seeds to germinate in the treated soil and the grass at about a 20% slower growth rate. We want to continue to work with these extracts in a more uncontrolled environment in the coming year.</p>	
<b>Summary Statement</b> Making and testing organic herbicides on rye grass in a controlled environment.	
<b>Help Received</b> Josh's dad drove us to get buckeyes and bay leaves. Our English teacher helped us with editing our writing.	