



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Ryan W. Brothers</b>	<b>Project Number</b> <b>J1604</b>
<b>Project Title</b> <b>What Happens When Plants Smoke?</b>	
<b>Objectives/Goals</b> My objective is to find out if smoke from burning chamise, eucalyptus, willow, or paper causes the seeds of Phacelia grandiflora seeds to germinate faster. The smoke produced from the burning paper will act as a control since it contains mostly cellulose and lacks oils or proteins. I plan to test this by exposing the Phacelia grandiflora seeds to smoke. The outside of the smoke chamber will be subjected to water, eliminating heat as a variable.	
<b>Abstract</b> <b>Methods/Materials</b> I collected the following plant species: chamise (Adenostoma fasciculatum), eucalyptus (Eucalyptus citriodora), and willow (Salix lasiolepis). I then took 20 Petri dishes and placed 100 Phacelia grandiflora seeds into each dish. I then treated 5 of the Petri dishes and seeds with smoke from one of the above three plant species. I continued using five Petri dishes and seeds with smoke from each of the other plant species and paper. I then added 5 ml of water to each dish I finally counted the number of seeds in each of the Petri dishes that germinated for 2-weeks, and recorded this information.	
<b>Results</b> The data shows that seed germination in Phacelia grandiflora treated with smoke from Eucalyptus was the highest with 99 seeds germinating. Chamise was a very close second with 98 seeds germinating. Treatment with smoke from willow leaves had 68 seeds germinating while only 33 seeds germinated with smoke from burning paper. The percent germination for each of the smoke treatment sources is as follows: Eucalyptus 19.8%, chamise 19.6%, willow 13.6%, and paper 6.6%.	
<b>Conclusions/Discussion</b> Smoke produced from dried chamise and eucalyptus produce a higher amount of germination in Phacelia grandiflora than smoke from willow or paper. The high values of germination in both chamise and eucalyptus treated seeds could be caused by the high oil content in these plants compared to willow and paper. Paper has no oil content, which is most likely why paper had the least amount of germination. My data both supports and rejects my hypothesis, which was that smoke produced from the chaparral shrub chamise increases seed germination in the Phacelia grandiflora. Because chamise smoke did have a higher germination on Phacelia grandiflora than willow or paper smoke, my hypothesis could be supported. However, eucalyptus smoke had the highest rate of germination on the Phacelia grandiflora.	
<b>Summary Statement</b> The influence of different types of plant smoke on seed germination in Phacelia Grandiflora.	
<b>Help Received</b> My Mom helped with the project board and my dad helped with treating the seeds with smoke in the smoke chamber.	