



**CALIFORNIA STATE SCIENCE FAIR  
2007 PROJECT SUMMARY**

<b>Name(s)</b> <b>Alena J. Raymond</b>	<b>Project Number</b> <b>J1725</b>
<b>Project Title</b> <b>There's a Fungus Among Us! The Effect of Mycorrhizae on the Growth Rate of Redwood Tree Seedlings</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Most of us only think of fungi as pathogens, parasites and decomposers. The purpose of my project is to call attention to the important role of fungi in symbiosis with plant life. Mycorrhizae is the symbiotic association between certain species of fungi and the roots of most plant species. My objective is to discover if mycorrhizae forming fungi have an effect on the growth rate of coast redwood seedlings (<i>Sequoia sempervirens</i>). Also, I hoped to determine if this effect is greater in seedlings that have been inoculated with mycorrhizae at germination compared to those that have mycorrhizae added later.</p> <p><b>Methods/Materials</b> The growth of forty redwood seedlings was measured, recorded, averaged, and compared before and after a period of 8 weeks. The parameters of growth measured were shoot height, longest root length, shoot and root volume, and shoot diameter. The seedlings were divided into four groups. Environmental conditions were controlled for.</p> <p><b>Results</b> All the plants (except for two from Group D that died) showed new growth in every parameter measured, as well as, in the number and length of new branches. Group B, with added mycorrhizae but not inoculated at germination, showed the greatest amount of growth in every measured parameter.</p> <p><b>Conclusions/Discussion</b> Over all, the evidence of growth and success of bringing the seedlings out of their period of dormancy was very interesting and exciting. The results of this study did not support my hypothesis. I thought the seedlings inoculated at germination and with mycorrhizae added at the time of planting (Group D) would show the greatest amount of growth because of being the most highly infected of all the groups. The only identified difference between Group A and Group B, besides genetic make up, is the addition of mycorrhizal forming fungi at planting time. The outcome of my experiment suggests that the greater measured growth of Group B could be attributed to the benefits of mycorrhizae. The outcome from groups C and D could be the result of damage to the roots when transplanted. I am still working on being able to determine which plants in my study are in fact infected with mycorrhizal fungi by sectioning, staining, and observing for the presence of mycorrhizae under a microscope.</p>	
<b>Summary Statement</b> My project compares the growth rate of coast redwood seedlings that have been inoculated with mycorrhizae forming fungi with those that have not.	
<b>Help Received</b> Glenn Lehar, Green Diamond Resource Co. Nursery Superintendent, generously donated coast redwood seedlings, the mycorrhizal fungi inoculum and his expertise; Dr. Terry Henkel, fungi specialist, and Dr. William Bigg, forest physiology and biometrics specialist, both offered their expertise and support.	