



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Emily M. Wachsner	Project Number J1731
Project Title How Do Different Variables Affect the Growth and Germination of Black and Lima Beans?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose was to determine the effects of light&temperature on black and lima beans, the depth of the beans planted, type of beans planted,&inoculant on the root structure of beans.</p> <p>Results Lima beans would not germinate in soil with a temperature of less than 70°F.Black beans needed soil temperature of at least 60°F.For packaged vs.store bought black and lima beans, there wasn't much difference in growth;they all sprouted near same time.Black beans in the light spouted about three to five days earlier than in the dark.Lima beans in the light and dark sprouted in five days.Deep planted black and lima beans had more sprouts than the shallow planted beans.The root structure of inoculant plants clung to the dirt more, there wasn't much difference with growth.</p> <p>Conclusions/Discussion Black beans and especially lima beans need warm soil for germination. Gardeners should not plant black or lima beans until spring temperatures reach around 70° F and should be sure to plant the beans at least a depth of 6 or 7 cm. Light does not seem to dramatically affect the germination of beans. About one week after germination, bean plants need to be transferred to a garden area to avoid spindly growth. The lima beans would not germinate in soil with a temperature of less than 70° F. Black beans needed a soil temperature of at least 60° F. For packaged vs. store bought black and lima beans, there was not much of a difference in their growth; they all sprouted in about the same amount of time. Black beans in the light spouted in about three to five days earlier than those grown in a dark environment, however, lima beans in the light and dark all sprouted in five days. The deep planted black and lima beans had more sprouts than the shallow planted beans. The deep grown lima beans were healthier, with a thicker stem, and were one centimeter taller with more new leaves. The root structure of the inoculant plants was much more fibrous and clung to the dirt more, but there was not much difference with its growth.</p>	
Summary Statement The purpose was to determine the effects of light and temperature on black and lima beans, the effects of the depth of the beans planted, the effects of the type of beans planted, and the effects of inoculant on the root structure of beans.	
Help Received Tutor assisted set up of the display board, Mother helped buy supplies.	