



# CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

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<b>Project Title</b> <b>Slash and Burn</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of my project is to determine if nitrogen and nutrient infused ashes from vegetation will have a significant affect on the pH level of soil and the overall germination, quality, growth and coloring of the plants rooted in the soil after a fire.</p> <p><b>Methods/Materials</b> Three tablespoons of grass seeds were planted into two tanks filled up # with a mixture of untreated soil from the nature and fertilized soil. After six weeks of growing, the grass in the experimental tank was burned using a torch and the ashes were worked into the soil. The blades of grass from the control tank were then plucked and the soil from both tanks was transferred to individual containers that grew broccoli, lettuce, chives, and spinach. How long it took for each plant to germinate was then recorded. After seven weeks of growing and observing the plants, the pH level of the soil in each container was calculated using strips of litmus paper. The height of each plant was determined while the stage of their development, quality, and coloring were compared.</p> <p><b>Results</b> The average pH in the experimental group was 7.05 while the average pH in the control group was 5.94. The plants in the experimental group germinated more rapidly and were generally more vibrant in their coloring, healthier, taller, more fully developed, had thicker stems and lateral branches, and were more voluminous.</p> <p><b>Conclusions/Discussion</b> The combustion of vegetation will increase the soil's potential of Hydrogen (pH) to the optimum range of 6.5 to 7, where beneficial microorganisms that perform nitrogen mineralization and fixation thrive. This results in an increase of ammonium. Ammonium is eventually converted into nitrate through the process of nitrification, which occurs more rapidly the warmer the soil's temperature. The burning process thereby results in increased total nitrogen, accounting for the healthier appearance of the plants rooted in the soil after the fire. An increase in soil pH also means that the soil's Cation-Exchange Capacity (CEC) increases, resulting in the soil's greater ability to retain nutrients. My project expands knowledge about the method of slash and burn agriculture by proving that it is efficient in increasing the soil's fertility levels. However, annual incinerating of vegetation exceeding a period of fifteen years results in lower levels of soil organic matter and lower rates of net nitrogen converted into mineral material.</p>	
<b>Summary Statement</b> The purpose of my project is to determine if ashes from combusted vegetation will have a significant affect on the pH level of soil and the overall germination, quality, growth and coloring of the plants rooted in soil after a fire.	
<b>Help Received</b> Brother helped with the torch during the combustion process; Science teacher provided me with basic techniques for starting my research; Mother bought the materials I needed to conduct my experiment.	