



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

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| <b>Name(s)</b><br><b>Talia K. Cohen</b>   | <b>Project Number</b><br><b>J1104</b> |
| <b>Project Title</b><br><b>Is Your Dirt Healthy? The Effect of Additives on the Microbial Balance in Soil</b>   |                                       |
| <b>Objectives/Goals</b><br>The objective of this work was to determine the effect of common soil treatments, such as fertilizer, herbicide, and compost, on the microbial count of healthy soil.  |                                       |
| <b>Abstract</b>   |                                       |
| <b>Methods/Materials</b><br>Four identical soil samples were taken and treated with fertilizer, herbicide, compost, and sterilization, and a fifth sample was left untreated. Samples of each parameter were diluted in Phosphate Buffered Saline and applied to agar plates. The colony forming units (CFUs) were counted using a microscope. Samples were taken on day one and day 23 after treatment.  |                                       |
| <b>Results</b><br>The CFU counts of the untreated, compost, and fertilizer-treated soils stayed relatively low and constant. The counts of the herbicide-treated soil were very high in the first test. In the second test, the herbicide counts were lower, but still definitely above the untreated soil. The soil that was sterilized had no CFUs after the first day, but in the second test it had extremely high counts.  |                                       |
| <b>Conclusions/Discussion</b><br>The results of this experiment suggest that treatments such as herbicide and sterilization eliminate types of bacteria that allow other, fast-growing bacteria to flourish. These results are relevant to people working with soil health and content. This could include farmers, particularly those interested in sustainability, and developers working with soil treatments and agricultural techniques. They are also significant for average citizens; it is good for gardeners and homeowners with lawns to know how products will affect their plants. |                                       |
| <b>Summary Statement</b><br>In this project, I determined the effect of various treatments on the bacterial count of soil.  |                                       |
| <b>Help Received</b><br>Used lab equipment at the NRI-MCDB Microscopy Lab (University of California, Santa Barbara) with the help of Dr. Mary Raven; Laurie Constable (Avalon Farms, Santa Barbara) provided soil; father helped edit report  |                                       |