



# CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

<b>Name(s)</b> <b>Easun P. Arunachalam</b>	<b>Project Number</b> <b>S1702</b>
<b>Project Title</b> <b>The Use of Pesticides and Their Impact on the Unintended Targets of Their Application</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Pesticides such as herbicides and insecticides are commonly used in domestic and agricultural settings to control unwanted vegetation and insect life. The goal of my project was to determine the pesticide (Atrazine, Malathion, or Roundup) that causes the most collateral damage to the vegetation in or around the intended target of the pesticide.</p> <p><b>Methods/Materials</b> During the course of my experiment I conducted a total of 60 separate trials: 30 with mung bean (<i>Vigna radiata</i>) seeds and the other 30 with garbanzo (<i>Cicer arietinum</i>) seeds. These seeds were chosen as test subjects for their versatility, availability, and rapid rate of growth. Each trial consisted of four Petri dishes, each of which contained ten seeds. In each trial, the first dish contained a control population (seeds grown in pure distilled water) and the remaining Petri dishes contained seeds along with a solution of one of the three pesticides: Atrazine weedkiller, Malathion insect spray, and Roundup weed &amp; grass killer. The objective was to determine the chemical that had the greatest detrimental effect on the seed populations. This was measured by counting the number of seeds that germinated successfully in the presence of each pesticide and comparing it against the germination of the seeds grown in the control environment. The total sample size of my experiment was 2400 seeds, which offset anomalies and irregularities to an extent.</p> <p><b>Results</b> The results indicate that the decreasing order of the average toxicity to <i>Vigna radiata</i> and <i>Cicer arietinum</i> was: Roundup &gt; Malathion &gt; Atrazine. The concentration recommended by the manufacturer for the application of Roundup (LD(100)) resulted in a 0% germination rate of both types of seeds. Atrazine and Malathion showed nearly identical rates of germination when applied to <i>Cicer arietinum</i>, but Atrazine produced a greater rate of germination than Malathion when applied to <i>Vigna radiata</i>. All three pesticides tested affected seed germination adversely.</p> <p><b>Conclusions/Discussion</b> My results revealed that my hypothesis was incorrect. RoundUp, not Atrazine, was the most detrimental to germination of seeds - the unintended targets of its application.</p>	
<b>Summary Statement</b> The goal of my project was to determine the pesticide (Atrazine, Malathion, or Roundup) that causes the most collateral damage to the unintended targets of its application.	
<b>Help Received</b> I would like to thank my advisor, Ms. Tuason, for her guidance and support. I would also like to thank my parents for helping me obtain the pesticides and taking pictures for the display board.	