



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Ryan J. Honda</b>	<b>Project Number</b> <b>S1409</b>
<b>Project Title</b> <b>Gamma Radiation Effects on Plant Growth</b>	
<b>Objectives/Goals</b> This experiment is a series of five minilab experiments. The first experiment examines & measures plant root & shoot growth in a Control farm & a Gamma exposed farm. The second experiment investigates how distance affects gamma radiation exposure by exploring The Inverse Square Law. The third experiment measures the absorption of gamma rays through the plastic viewing window. The fourth experiment measures the intensity of gamma radiation via the absorption of gamma rays through the plastic viewing window & soil. The last experiment measures how much gamma radiation the gamma exposed farm received. My hypothesis is plant root & shoot growth decrease as the intensity of gamma radiation increases as a function of distance, shielding, & exposure time.	
<b>Abstract</b>	
<b>Methods/Materials</b> <ol style="list-style-type: none"><li>1. Two Root-View Farms (Control &amp; Gamma)</li><li>2. Cutout plastic viewing window</li><li>3. Spectrum Techniques ST-360 Counter with GM Tube &amp; stand</li><li>4. Sony Vaio Computer</li><li>5. 10 Radioactive Gamma Sources</li><li>6. Radish seeds</li></ol>	
<b>Results</b> <p>Minilab 1: TABLE 1 &amp; GRAPH A show an average of 24% less root growth &amp; Table 2 &amp; GRAPH B show an average of 32% less shoot growth in the Gamma farm samples when compared to the Control farm samples for plants 17, 18, &amp; 19.</p> <p>Minilab 2: Gamma radiation exposure to plant roots and shoots is a function of distance. A decrease in root &amp; shoot growth occurs when seeds are planted next to the gamma sources &amp; compared to control samples as demonstrated in TABLE 1, TABLE 2, GRAPH A, &amp; GRAPH B in MINILAB #1. Retarded cell growth is greatest when the plant is located directly next to the radioactive gamma source.</p> <p>Minilabs 3 &amp; 4: TABLE 6 shows the plastic viewing window of the gamma farm absorbing 10% of the gamma intensity when compared to gamma readings without a shield. TABLE 7 shows the plastic viewing shield absorbing 21% of the gamma intensity &amp; 33% using the plastic viewing shield plus soil when compared to gamma readings without a shield.</p>	
<b>Summary Statement</b> <p>This project is a series of five minilab experiments that test the effects of gamma radiation on plant root and shoot growth as a function of distance, shielding, and exposure time.</p>	
<b>Help Received</b> <p>Used lab equipment at Ribet Academy; used microscopes at Veterans Hospital</p>	