



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Derek J. Wong	Project Number S1736
Project Title Effects of a Selective Herbicide on Germination	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals A study was done to determine the germination rate and growth patterns of the non-target plant <i>Vigna radiata</i> when given the selective herbicide Spectracide at 3 different applications. A 0.1 ml dosage was applied either one time a day for ten days at 0.01 ml per day (group 4), one time only at the first contact to water (group 2), one time at the first sign of germination (group 3), and not at all (group 1).</p> <p>Methods/Materials 144 mung bean seeds were tested, checked for deformities before beginning the experiment. 9 cups per group with sets of 4 seeds per cup were stored in plastic boxes covered by a translucent plastic wrap for heat and water retention. Groups were put in a mostly shady, balcony environment and given their specific amount of herbicide daily. Distilled water was added as needed in order to submerge approximately half the width of the seed. Length of the root was measured daily and placed into categories of length in increments of 5 millimeters.</p> <p>Results The herbicide immediately slowed any germination, seen when only seeds from groups that had not been treated germinated on the first day of measurement. No group but the control developed hypocotyls or true leaves. In herbicide treated groups, slight thickening of the radicle but little elongation occurred. It was apparent that the herbicide did significantly impede growths in all groups treated comparing to the control. Group 4 showed the most growth and was the only herbicide treated group to have a positive trend. Both groups 2 and 3 showed negative growth towards the end of the experiment, seeds from group 2 slightly less affected than those of group 3.</p> <p>Conclusions/Discussion It can be concluded that this herbicide is detrimental to <i>Vigna radiata</i>. The product will suppress growth of the root in all cases, but works best after seeds have sprouted with application beforehand as a close second. However, non-target seed roots should continue to grow with multiple, smaller applications. The generalization can be made that all legumes will show a similar response to the herbicide and that all non-target plants may be affected by these chemicals. Plants with stress tolerance capabilities that are the same as <i>V. radiata</i> will show a similar pattern of growth, and those with less tolerance may have an even slower growth or may be killed off entirely. Seeds with more stress tolerance may be able to recover faster and sustain a quicker growth.</p>	
Summary Statement The commercially formulated selective herbicide blend Spectracide was tested on hydroponically grown seeds of the non-target plant <i>Vigna radiata</i> at three applications of varying time and rate.	
Help Received I would like to thank my mother for helping me with the display board and my father for his assistance during daily data collection.	