



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

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Project Title The Effects of Mycorrhizal Inoculation Compared to Pesticide Use on Milkweed Plants	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Mycorrhizae is a natural fungus that increases the surface area of the roots. This makes hard-to-capture nutrients available to plants, allowing them to be bigger, and healthier. It is also known to speed up the pest-defense mechanisms in plants. The goal of this experiment was to see if the mycorrhizae could be used as effectively as commercial pesticides.</p> <p>Methods/Materials A total of 270 milkweed seeds were planted into 50 mL cups of sterilized soil. Five seeds were placed into each cup. The soil was sterilized in an oven so that none of the dirt had preexisting organisms. First the seeds were sprouted in petri dishes and once sprouted, transferred into the dirt and planted into 9 rows, each row having a different level of mycorrhizae in each plant cup (4g, 3g, 2g, 1g, 0g). There was a second row planted without mycorrhizae to spray with pesticide, seeing how effective it was with this plant and pest coupling. They were allowed to grow for 3 weeks. When the bugs were released, mesh screen was put around the plants on a wooden frame, so that the bugs could not escape. On the top of this screen, there were 5 holes cut (one at each corner and one in the center) to drop the milkweed bugs through. Upon releasing the bugs, the holes were taped up and the bugs were free to eat. The plants were observed at three different times to see where the bugs preferred to eat.</p> <p>Results When growing, it was found that the 3g row had the highest average growth (more than 1cm taller than the rest); followed by 4g; 0g; 1g; and lastly, 2g. A majority (77%) of the bugs were on the control and pesticide-sprayed rows. Observations were taken on bug arrangement at three different times. On average (rounded to the nearest whole number), there was 1 bug out of the 40 on the row with plants given 4g of mycorrhizae; 2/40 bugs on the 3g row; 1/40 bug on the 2g row; 2/40 bugs on the 1g row; 7/40 bugs on the control row; and 7/40 bugs on the pesticide row.</p> <p>Conclusions/Discussion With these results, it is clear to see that mycorrhizae have a positive impact on the plants# resistance to pests. Mycohhizae can limit the use of pesticides. For future studies, it would be beneficial to do this experiment on a larger scale, with more trials, and find the specific level at which the mycorrhizae is most affective.</p>	
Summary Statement The effects of a natural pesticide, mycorrhizae, were compared with a chemical-based pesticide; it was found that the mycorrhizae is a better pesticide than chemicals.	
Help Received	