



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2019 PROJECT SUMMARY**

<b>Name(s)</b> <b>Michael Bedrosian</b>	<b>Project Number</b> <b>J2104</b>
<b>Project Title</b> <b>Comparing the Effectiveness of Different Natural Repellents in Controlling the Vine Mealybug</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The objective of my study is to determine if there is a natural repellent for the vine mealybug. My goal is to prove that organic neem oil will eliminate the vine mealybug the best. This can give farmers, landscapers, and consumers a natural option for spraying their crops and plants, rather than using pesticides.</p> <p><b>Methods</b> Procedure for Making Natural Repellents: Tomato leaf spray, chopped leaves in blender with water, and strained. Garlic spray, chopped bulbs in blender with water, and strained. Hot pepper spray, chopped habanero peppers in blender with cayenne and water, and strained. Organic white vinegar with 50% water mix. Organic apple cider vinegar with 50% water mix. Organic neem oil, store bought. Field Testing Procedure: 21 infected vines, using 3 vines per spray type. Measure infected area and pest population. Then apply repellents. After 7 days, record measurements and calculate percentage of infestation remaining. Lab test: Use 7 butternut squash. Inoculate and sanitize at Kearney Ag Research Center. After 6 weeks, estimate vine mealybug population, and apply 1 natural repellent on each specimen. After day 3 and 7, check pest population on specimens. Record results, and calculate percentage of infestation remaining after test.</p> <p><b>Results</b> The results of my investigation shows that organic neem oil did the best. It eliminated 90% of the mealybug population on the field and lab test. Organic white vinegar and hot pepper sprays eliminated 30% on the lab test. On the field test, organic white vinegar spray eliminated 20% of the mealybug population. Hot pepper spray eliminated 30% on the field test. Organic apple cider vinegar spray, tomato leaf spray, garlic spray, and my control (water), had no significant change of mealybug population on the field and lab test.</p> <p><b>Conclusions</b> I found out that my hypothesis was correct that neem oil eliminated the most vine mealybug population. Organic neem oil eliminated 90% of the mealybug population on the field and lab tests. Organic white vinegar and hot pepper spray eliminated 20-30% on the field and lab tests. The tomato leaf, garlic, organic apple cider vinegar sprays, and my control (water) had no significant change to the vine mealybug population. This shows me that there is a natural repellent that we can use to eliminate this harmful pest.</p>	
<b>Summary Statement</b> Neem oil proved to be a natural repellent that eliminated the mealybug, which gives farmers, landscapers, and consumers an option instead of using pesticides.	
<b>Help Received</b> Mr. Bryan Bedrosian, Owner Bedrosian Farms, Fowler; Mr. Kent Daane, Professor Parlier Ag Research Center; Mr. Garrett Rosales, Lab technician, Parlier Ag Research Center; Mr. David Obermiller, Harvest Field Farms, Fresno	