



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Ellen Kae Horowitz	Project Number S1715
Project Title Testing Essential Oil Pesticides against Common Greenhouse Pests	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project is to test the use of #bee friendly# essential oil pesticides to treat two major pests, Green Peach Aphids and Sweetpotato Whitefly.</p> <p>Methods/Materials Green Peach Aphids and Sweetpotato whitefly were tested on roses and poinsettia as their hosts. The following essential oils were tested: bergamot, peppermint, and thyme. Water and polysorbate were negative controls, and Break-Thru and Proud 3 were positive controls. Plants were sprayed every 5-7 days and populations determined by counting 1-2 days before re-application.</p> <p>Results The most effective treatments were the essential oils, thyme and peppermint and Break-Thru where they significantly decreased the aphid populations in comparison to control treatments ($p < 0.05$). Thyme showed a higher efficacy than Break-Thru at day 21. Peppermint showed a higher efficacy than BreakThru at day 35. By day 47 the populations of aphids were similar for all of the treatments, indicating resistance had set in. For Sweetpotato Whitefly, none of the essential oils significantly decreased insect populations; only Break-Thru affected the adult Sweetpotato Whitefly.</p> <p>Conclusions/Discussion The essential oils solutions of peppermint and thyme could be used in a farming system called pesticide rotation. Since it is not uncommon for insects to become to resistant to any type of pesticides, the farmers would only use the oils for a period of 3-4 applications of the pesticide per month, then stop use after that month since the insect would later become resistant, and move onto a use of another pesticide. This study's results for Green Peach Aphids support the hypothesis, however the results do not support the hypothesis for the Sweetpotato Whitefly.</p>	
Summary Statement Three essential oils (thyme, peppermint, and bergamot) were tested to see if they could be used as pesticides against the Green Peach Aphid and the Sweetpotato Whitefly.	
Help Received Dr. Villavicencio allowed use of space at the Center for Applied Horticultural Research and answered any questions.	