



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Zachary Leitzel	Project Number J2119
Project Title Does Orange Oil Really Work? A Study of Synthetic vs. Organic Pesticides	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals One serious threat to the preservation of our streams, lakes, and ocean is pesticide run-off. Long-lasting synthetic pesticides that are sprayed throughout California can be washed away by rain and irrigation, causing a harmful run-off of pesticides that has dramatic effects on fish and aquatic birds. My goal was to determine if organic pesticides that have been introduced to the professional pest control industry over the past decade could compete with synthetic pesticides. These new natural pesticides, like Orange Oil and Mint Oil, are not being used very much by most professional exterminators. I wanted to find out if they did as good a job as the synthetic pesticides. My hypothesis was that synthetic pesticides would outperform the organics.</p> <p>Methods/Materials After interviewing industry professionals I tested the two factors that were important to them in choosing a pesticide, initial knock-down and residual effectiveness. To test knock-down I directly treated 4 groups of 15 test subjects (crickets) with 2 synthetic and 2 organic pesticides. To test residual effectiveness I treated a test board with 1 synthetic and 1 organic pesticide then exposed groups of 15 test subjects to each section of the treated board at 1 and 7 day intervals. All experiments were duplicated for accuracy and control groups were used to rule out unforeseen errors. In total 330 crickets were tested. 270 were exposed to treatments in the experiments and 60 were in control groups.</p> <p>Results As expected, the synthetics outperformed the organics in residual effectiveness, but the Mint Oil showed even better knock-down than the synthetics.</p> <p>Conclusions/Discussion Overall, synthetic pesticides outperform organic ones. However, if a professional exterminator company wanted to offer a service utilizing only organic pesticides, they could reasonably do it. They would probably just need to visit the property more frequently; monthly instead of every other month. With further scientific development, we may one day see organic pesticides completely replace synthetic ones, much to the benefit of our environment.</p>	
Summary Statement My project compares the effectiveness of some selected synthetic pesticides vs. some of the new organic pesticides to determine if the organic pesticides can replace the synthetics and help improve our impact on the environment.	
Help Received My father helped me print out pictures and charts. My mother helped me purchase all the materials I needed for my experiments and my presentation board.	