



# CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

<b>Name(s)</b> Suchitra Dara	<b>Project Number</b> <b>J1708</b>
<b>Project Title</b> <b>How Can Farmers Use a Friendly Fungus for Environmentally Safe Pest Control?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this study is to find out an ideal time interval for applying a beneficial fungus-based biopesticide (used for controlling pests) and some fungicides (used for controlling plant diseases) so that environmentally safe pest control is encouraged in practical agriculture.</p> <p><b>Methods/Materials</b> Plastic containers, insect pathogenic fungus, fungicides, mealworms, etc. Worms were exposed to treated surfaces and daily mortality was observed for 7 days. Total mortality in each treatment due to the fungus indicates the impact of fungicides on fungus.</p> <p><b>Results</b> There was no natural death in untreated control during the experiment. All the mealworms treated by <i>B. bassiana</i> alone died by the end of the experiment. Fungicides alone did not have any impact on mealworms. Time interval between fungicide, Pristine and <i>B. bassiana</i> had a positive correlation, but it took 6 days for the fungicide effect to decrease. Increasing time interval between Merivon or Switch and <i>B. bassiana</i> had positive correlation up to 3 days and then showed a negative correlation from 4-6 days. Efficacy of <i>B. bassiana</i> was reduced to 80% even when Pristine# was applied 6 days earlier. Merivon and Switch reduced the efficacy of <i>B. bassiana</i> to 90% and 70%, respectively, with a 3 day interval between applications.</p> <p><b>Conclusions/Discussion</b> Insect pathogenic fungi like <i>B. bassiana</i> are commercially available as biopesticides. However, farmers frequently apply fungicides for controlling diseases. As this practice is detrimental to beneficial fungi, farmers use chemical pesticides which are not safe for the environment. Increase in mortality with a short time interval between fungus and fungicide applications is ideal for practical agriculture. In the case of Pristine it took 6 days for the fungicidal impact to wane. Negative impact of Merivon and Switch was reduced within 3 days after application, but they have become detrimental to the fungus afterwards. Change in the fungicide chemistry or chemical breakdown in the environment could have made these two fungicides to become harmful after three days. Results of this study are important in determining safe time intervals between fungicides and a beneficial fungus so that farmers know an appropriate time to apply beneficial fungi for pest management. This will promote safe pest management practices, reduce the use of chemical pesticides, and thus improve environmental safety.</p>	
<b>Summary Statement</b> Evaluating the compatibility of fungicides and a fungus-based biopesticide for safe pest management and improving environmental safety.	
<b>Help Received</b> Father helped with fungicide and biopesticide application and analyzing results.	