CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)
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Project Number
35097

Project Title
Helping Farmers Improve Pest Control with a Friendly Fungus

Abstract

Objectives/Goals
The overall objective of this project was to promote sustainable agriculture by increasing biopesticide use and reducing chemical pesticide use. Fungus-based biopesticides are commercially available, but there is a big question about their fate when fungicides are also applied for plant disease control. To address this issue, two objectives were included in this study:
i) Evaluate the compatibility between an insect pathogenic fungus (Beauveria bassiana)-based biopesticide and eight fungicides from different modes of action groups and
ii) Evaluating the potential of increasing the compatibility between the fungicides and the beneficial fungus by increasing application intervals.

Methods/Materials
Mealworms were exposed to paper towels treated with B. bassiana and eight fungicides (Captan, Merivon, Microthiol Disperss, Pristine, Rally, Rovral, Switch, and Thiram) applied from 0 to 6-day intervals. B. bassiana and fungicides alone along with untreated control were also used for comparison. Mortality was observed daily for seven days. Total mortality in mealworms from fungus and fungus-fungicide combinations were compared among treatments and results from all three assays were averaged. Data were analyzed using statistical procedures. The impact of time intervals was also assessed.

Results
Very few fungicide treated mealworms died (6 out of 560), so it can be assumed that fungicides alone did not impact the mealworm survival. Also, none of the untreated died and all the B. bassiana-treated ones died, so the mortality in other treatments was from B. bassiana as impacted by fungicides. Fungicides, Captan and Thiram affected B. bassiana negatively, resulting in 43 and 57% mortality in mealworms, respectively. The remaining fungicides had no negative impact on Beauveria bassiana, resulting in 96-100% mortality in mealworms.

Conclusions/Discussion
Farmers should avoid using Captan and Thiram while considering the usage of B. bassiana for pest management. The other six fungicides, however, are very compatible and support sustainable pest control practices.

Summary Statement
The objective of this experiment is to promote biopesticide use and reduce the dependance on chemical pesticides by investigating the impact of various fungicides on a fungus-based biopesticide.

Help Received
Other students and my father helped with the set up and execution of the project.