



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Sean A. Curtice	Project Number S1411
Project Title Reducing Bacterial Growth in Commercial Mushroom Production Using Antiseptic Herbal Extracts	
Abstract Objectives/Goals Developing an herbal antibacterial that is safe to use on <i>Agaricus bisporus</i> would be very useful in the mushroom cultivation industry. It was hypothesized that herbal antiseptics such as garlic and tea tree oil can be used to reduce bacterial growth in commercially cultivated <i>Agaricus bisporus</i> fertilizer without producing negative effects upon the mycelia. Methods/Materials Mushroom fertilizer samples provided by Monterey Mushrooms were treated with tea tree oil solution and garlic extract solution. The samples were tested for bacteria on tryptic soy agar in comparison to control samples. Tea tree oil dilutions in 1/10 increments were then tested. Mycelium samples treated with each of the dilutions were also grown in sabouraud agar. Results Tea tree oil was found to be effective against bacteria. It was discovered that smaller concentrations (about 0.01%) of tea tree oil allowed for fungal growth, while larger concentrations did not. The final results of this study showed that tea tree oil can be applied to <i>Agaricus bisporus</i> without inhibiting mycelial growth. Conclusions/Discussion The results of this study yield important knowledge that could be exceedingly advantageous for the mushroom industry. The findings were sent to contacts at Monterey Mushrooms, who were quite interested and intrigued, and acknowledged that the discovered information was potentially very useful to the mushroom industry.	
Summary Statement This study seeks to reduce the growth of harmful bacteria in commercially grown <i>Agaricus bisporus</i> using various herbal extracts.	
Help Received Mr. Wayne Bautista of Monterey Mushrooms provided <i>Agaricus bisporus</i> fertilizer; Mr. Ed Smith, author of Therapeutic Herb Manual, recommended herbal extracts; Ms. Jill Giesick, microbiologist, made recommendations for bacteria testing; Dr. Jay Vavra at High Tech High supervised laboratory work	