CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Claire N. Bedbrook

Project Number
S1602

Project Title
Are Organic Tomatoes More Susceptible to Mold than Conventionally Grown Tomatoes?

Abstract

Objectives/Goals
The hypothesis that I have tested is that organic tomato fruit are more susceptible to fungal infection than conventionally grown tomato fruit, because they are not protected with pesticides and herbicides during growth.

Methods/Materials
Conventionally grown and organic cherry tomato fruits (10 fruits/test) were compared for their susceptibility to a) spontaneous infection after puncturing, and b) to two common fruit molds, Botrytis and Cladosporium, after surface innoculation. Washed and unwashed samples of each class were compared, and the microbial populations in the surface washes were examined.

Results
Statistical analysis indicates that organic fruit were significantly more likely to grow mold at experimentally induced punture sites than conventionally grown fruit. On the other hand organic fruit were found to be significanlty less susceptible to experimental infection with Botrytis than conventionally grown fruits. There was no significant difference in the level of susceptibility to experimental Cladisporium infection between organically and conventially fruit. Through examination of the surface microbial flora from organic fruit, I was able to isolate a microbe that appeared to control Botrytis growth.

Conclusions/Discussion
Experiments described here show that organic tomatoes have a diverse microbial flora on their surface, compared to conventionally grown fruit. This microbial flora, coupled with fruit damage, seems to be responsible for the high incidence of black mold growth on organic fruits in the supermarket when compared to conventionally grown fruit. On the other hand this microbial flora on the surface of organic tomato fruit also seems to be responsible for decreased susceptibility of organic fruit to infection by the grey mold pathogen, Botrytis, when compared to conventionally grown fruit. A working model for both observations is proposed.

Summary Statement
My project is about the susceptability and control of microbial infections on organic and conventionally grown tomato fruit

Help Received
Dr Trevor Suslow, UC Davis provided Botrytis and Cladisporium, PDA plates for fungal growth and Dr Jim English, Verdia Inc. provided LB and PDA plates for microbial growth