CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.)
Crissy M. Orr

Science Fair Use Only

J0316

Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)
Using ELISA Biotechnology for the Quality Control of Beneficial Insects

Division
X **Junior (6-8)** _ **Senior (9-12)**

Preferred Category (See page 5 for descriptions.)
3 - Biochemistry / Molecular Biology

Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.)
Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.

In the business of mass-rearing insects, the fecundity, or the reproductive rate, is often used to find the quality of the insects. This method of testing is very time and labor consuming because the eggs must be counted and the number of eggs per female must be found every day over the time that the adult insect is laying eggs. As most insects lay eggs for two weeks to a month, finding this data takes a long time.

I wanted to find out if I could use ELISA (enzyme linked immunosorbant assay) testing instead of the more common fecundity study to find the quality of the colony of insects. ELISA testing would make it possible to find how many egg yolk proteins are in a female insect#s body. ELISA works by using a selected antibody against an antigen. An ELISA test takes a short amount of time to complete and is usually correct. If this method of testing could be used, it would save insectaries a lot of time and labor, as well as make it possible to set a standard in the mass-reared insect environment.

I used Orius insidiosus, a predatory beneficial insect, in my tests. I compared the fecundity counts and the ELISA tests of two separate colonies of these Orius to see if the ELISA tests would work effectively. I did this by testing both of the colonies of Orius with both the ELISA and fecundity methods and comparing the data. If the ELISA test#s potential egg numbers and the actual fecundity numbers were close the ELISA test would be eligible to be used for testing insects.

So far, I have found that I am not yet able to correlate the fecundity counts and the ELISA tests. The results of the refined ELISA test will bring me closer to correlating with the fecundity study of the second batch of insects.

Summary Statement (In one sentence, state what your project is about.)
Developing ELISA (enzyme linked immunosorbant assay) testing to quantify potential fecundity in beneficial insect colonies could replace the more expensive and time-consuming fecundity study currently used to determine the quality of insect

Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.
I worked with Jeff Shapiro, Ph.D at the Center for Medical, Agricultural and Veterinary Entomology to develop my project and learn about ELISA tests. I sent samples of the insects that I used for my fecundity study to Dr Shapiro and he did the plates. Then we collaborated on the data. Syngenta Bioline Inc. supplied laboratory space, two colonies of Orius ins