



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Karley J. Lassley	Project Number 34246
Project Title Detrimental Effects of Commercial Fertilizers on Rana catesbeiana	
Objectives/Goals The purpose of this experiment is to analyze the detrimental effects of commercial fertilizer on Rana catesbeiana. Rana lay their eggs in large clumps to ensure some will survive in their dangerous environment. Aquatic ecosystems have several necessary pieces to the puzzle. If even one piece is off, then the entire biological equilibrium will be skewed. When fertilizers run-off into surface water, eutrophication occurs. It results in explosive growth of algae and aquatic death. The run-off can alter pH levels causing more ammonia to exist in the free form, which is poisonous to aquatic life. Abstract Methods/Materials Test includes 3 independent variables at 2 different strengths and a control group. Cut ends off water bottles and drill 3 holes in the lid. Invert bottles in plastic cup; add sterilized soil, sterilized rocks and fertilizer. Pour water slowly into bottle over soil, rocks and fertilizer to produce run off solution. Repeat test replacing % of fertilizer. Set run off test solutions aside. Pour distilled water in 70 cups, place cups in container. Fill storage container with warm water. Add fish tank water heaters. Add frog eggs to each Test cup. Measure 15ml of run off solution and add to each cup with frog eggs. Repeat with stronger solution. Check each test container for Nitrite, Nitrate, and pH levels record in data book to develop base line levels. Observe each test cup for Frog egg hatch rate and observe any abnormalities to egg sac. Results The hypothesis was incorrect; the triple 15% solution had less of an effect on eggs than the K-mag 15% solution. The Fertilizers: Triple 15-15-15, K-mag, and Ammonium sulfate 25% solutions indicated that the run-off of this strength is dangerous to Rana hatch rate. The 15% solution of Ammonium sulfate was also dangerous having a negative effect on hatch rate. 15% of Triple and K-mag did allow a small amount of eggs to hatch. The control group only allowed 38% of Rana eggs to hatch, possibly due to testing window, and Rana development Conclusions/Discussion In conclusion, the fertilizers all cause adverse effects to the aquatic environment. These dilutions would be harmful to aquatic life. Research and testing indicate that fertilizers are not safe for biological equilibrium of aquatic ecosystems. Agriculturalists must find ways to cause greater absorption of nutrients into the soil. That way any run-off will not overly increase the nutrients in the environment.	
Summary Statement This investigation is designed to emphasize the harmful effects on commercial grade fertilizers on aquatic environments and organisms with in them, such as rana catesbeiana	
Help Received Mother helped with photos. Patty Cardoso supplied fertilizers. Blue lobster farms supplied frog eggs	