



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Alexandra de la Torre	Project Number J1411
Project Title How Fertilizers Affect Eisenia fetida's Mortality Rate and Cocoon Production	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Fertilizers, intended to improve the quality and fertility of the soil, might be harming earthworms. The objective of these tests was to determine the possible effect of two common inorganic fertilizers, and one organic fertilizer on the mortality rate and cocoon production of <i>Eisenia fetida</i>.</p> <p>Methods/Materials 100 worms were placed in each of 4 containers. The worms were covered with a layer of soil. The control group received additional soil, food scraps, and yard debris. The second, third, and fourth containers each received that same mixture plus either 77.93 grams of Earthgro Steer Manure Fertilizer, 1.15 grams of Scotts Starter Fertilizer (a slow release fertilizer), or 1.73 grams of Vigoro All Purpose Fertilizer, respectively. The amount of fertilizers applied was based on the recommended amount for that surface area. The soil had a controlled moisture and pH level. After 11 days the contents of the containers were sorted and counted. This ended Test#1. The same procedure was repeated for Test #2, and Test #3. All containers had the same number of mature worms (with clitellum). The other worms were juveniles of various sizes.</p> <p>Results The control group had 282 worms out of 300, 55 cocoons, and 18 deceased worms. The group with manure had 282 worms, 51 cocoons, and 18 deceased worms. The group with Scotts Fertilizer had 281 worms, 42 cocoons, and 19 deceased worms. The group with Vigoro Fertilizer had 233 worms, 9 cocoons, and 67 deceased worms.</p> <p>Conclusions/Discussion The sampled inorganic fertilizers reduced <i>Eisenia fetida</i>'s cocoon production. The Vigoro Fertilizer caused a 22.33% mortality rate (The mortality for the other fertilizers, and the control group, ranged from 6% to 6.33%.), and reduced cocoon production by 84%. The Scotts Fertilizer caused a 24% reduction in the cocoon production, and a negligible change in the mortality rate. The manure had little or no effect. The immediate release feature of the Vigoro Fertilizer's chemicals were toxic to <i>Eisenia fetida</i>. The Scotts Fertilizer's slow-release feature reduced the amount of fertilizer chemicals released into the soil. A longer series of tests, including regular watering, may be required to better determine the effects that may be caused by the further release of Scotts Fertilizer's chemicals. Further studies are needed to determine how the fertilizer's toxicity may have affected the cocoons' fertility, and the viability of the newly born worms.</p>	
Summary Statement This experiment showed that inorganic fertilizers can be toxic to <i>Eisenia fetida</i> .	
Help Received My father provided advice, and support.	