



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Andee L. Poole	Project Number J1924
Project Title Investigating if Aged Bovine Manure Loses Its Nutrient Levels and Effectiveness as a Plant Fertilizer	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project was to investigate if bovine manure loses its nutrient levels and effectiveness as a plant fertilizer as it decomposes.</p> <p>Methods/Materials Three ages of bovine manure were collected; the oldest manure was 6 months old, the middle- aged manure was 2-3 months old, and the youngest manure was fresh. After creating a mixture of manure and water by adding 175mL water to 10 grams of a specific manure age, radish and fescue seeds were planted hydroponically. The seeds were allowed to grow in 9oz SOLO cups for 14 days, and the average plant heights were measured. To test the amounts of nitrogen, phosphorus, and potassium within each age of manure, the Rapitest Soil Test Kit was used. A four to one solution of water and manure was allowed to settle for three hours; then the liquid of the solution was placed in the test comparator. A pill was mixed in the water, and the water colors were compared to determine nutrient levels.</p> <p>Results After my experiment, my results indicated that the oldest manure contained the highest levels of nitrogen, potassium, and phosphorus. The oldest manure acted as the best fertilizer for the radish plants, and the middle- aged manure was the best fertilizer for the fescue grass. The youngest manure contained the lowest nutrient levels and acted as the worst fertilizer for both the fescue grass and the radish plants.</p> <p>Conclusions/Discussion Contrary to my hypotheses, which stated that the youngest manure would act as the most effective fertilizer and contain the highest nutrient levels, the oldest manure contained the most nutrients. The oldest and middle- aged manures were also the best plant fertilizers. Soil tests should be conducted to measure necessary nutrients needed to cater to certain crops since there is a relationship between nutrient abundances and effective fertilizers. Aged manure should also be used as fertilizer instead of younger manure to achieve potential plant growth</p>	
Summary Statement My project will determine at what age, or level of decomposition, bovine manure should be used as a plant fertilizer based on its effectiveness and the level of nutrients it contains.	
Help Received Mother helped take photographs of the experiment and arrange the science board.	