



**CALIFORNIA STATE SCIENCE FAIR  
2017 PROJECT SUMMARY**

<b>Name(s)</b> <b>Jahari Garcia</b>	<b>Project Number</b> <b>J1115</b>
<b>Project Title</b> <b>Investigating the Effects of Various Organic Substance in Changing the Nutrient Levels in Soil</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> I wanted to determine the effectiveness of various organic substance in changing the nutrient levels in soil.</p> <p><b>Methods/Materials</b> I used soil and nine ounce plastic containers. The organic substances I used are broccoli, potato skins, egg shells, oranges, and chicken bones. I placed the organic substances in a food processor one at a time. After being processed I added one organic substance to each plastic container with soil. I tested the nitrogen, phosphorous, potassium, and PH in the soil with a HoldAll soil test kit prior to adding the organic substances. I placed all of the plastic containers in a covered box and placed the box outside. After three weeks, I tested the nitrogen, phosphorous, potassium, and PH in each organic substance/soil mixture six times for a total of thirty tests using the HoldAll soil test kit. After recording the results, I calculated the average nutrient change for each test variable.</p> <p><b>Results</b> The oranges had the biggest effect on potassium increasing it from low to high. The broccoli and oranges had the same effect on nitrogen increasing the level from very low to medium. The only organic substance that even remotely had an effect on phosphorous was oranges. Oranges and broccoli also had the biggest effect on PH. Based on this investigation oranges came in first having the most effect on soil nutrients with broccoli coming in second place. Potassium and phosphorous are essential plant nutrients and are required in large amounts for proper growth and reproduction of plants. Using organic substance to create a healthy soil environment is a clean substitute for pesticide use in agriculture. Organic crops are becoming more and more important as we face rising concerns over illnesses, diseases, and environmental impacts.</p> <p><b>Conclusions/Discussion</b> My hypothesis was that the oranges would change the nutrient levels in the soil more than the other organic substances. My results supported my hypothesis because they had the biggest effect on potassium increasing it from low to high and changed the nitrogen level from very low to medium. The oranges were the only organic substance to have any effect on phosphorous. Oranges also had a significant effect on the soil PH. This project expanded my knowledge on how organic substance can be used to create sustainable and clean crop growing methods.</p>	
<b>Summary Statement</b> I used broccoli, potato skins, egg shells, oranges and chicken bones to show that organic substances are an effective substitution to pesticides in changing soil nutrients.	
<b>Help Received</b> Mr. Carl Gong gave me feedback on the soil test kit I selected. As a result of his feedback, I found that It was important to test the potassium, phosphorous, nitrogen, and ph in the soil. My school science teachers, Brianne Fidalgo and Susan Wright gave me guidance on how to input my results/data into the	