



**CALIFORNIA STATE SCIENCE FAIR  
2012 PROJECT SUMMARY**

<b>Name(s)</b> <b>Michael Castillo</b>	<b>Project Number</b> <b>J1905</b>
<b>Project Title</b> <b>Which Organic Material Has the Least Soil Compaction Rate and Allows for the Best Plant Growth?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My goal was to determine which organic mixings have the least compaction rate when mixed with water and soil and will help plants grow the best. I wanted to know the best way to prepare the soil to promote maximum growth once they are transplanted into the ground.</p> <p><b>Methods/Materials</b> I used a 5 gallon bucket with a 1 inch diameter hole drilled 5 inches from the bottom and placed a 1 inch by 10 inch wooden dowel with a hook screw inserted at the end. I then filled the bucket 3/4 quarters of the way with top soil mixed with 2 cups of organic material. Organic materials included wood chips, small rocks, leaves, potato peels, grape extract and grass clippings. I added 2 cups of water and placed 2 bricks on top of soil for 2 minutes then proceeded to remove the dowel using a newton compaction tool. This procedure was repeated 5 times for each organic material. After completing this procedure, I poured the mixture into a 20 1/2 inch by 10 inch plant container and placed a 20 inch by 9 3/4 inch wooden palate over the soil and placing 2 bricks for 5 minutes to compact soil. Finally, I planted 3 rows of wheat grass in each container.</p> <p><b>Results</b> The average newtons needed to pull the dowel was 8.5 newtons and the average height of wheat grass was 3.3 centimeters. The maximum height of the wheat grass was 5 centimeters using grape extract which allowed for the best plant growth and the least compaction rate was 7 newtons using grass clippings. The lowest height of wheat grass was 2.5 centimeters using wood chips. The most newtons was 11.5 using grape extract.</p> <p><b>Conclusions/Discussion</b> After testing, I found that grape extract allows for the best plant growth but also has the most newtons. Grass clippings has the lowest compaction of 7 newtons but also has the least plant growth. Crops that are grown using the other organic materials used in this project will not have their best plant growth.</p>	
<b>Summary Statement</b> To determine which organic material has the least soil compaction rate and allows for the best plant growth.	
<b>Help Received</b> Mother helped with typing and Father assisted with testing procedures.	