



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

Name(s) Gabriella Dow	Project Number J1109
Project Title Using Calcium to Combat Acid Rain	
<p style="text-align: center;">Abstract</p> <p>Objectives To find out if a pellet or powder form of calcium carbonate will buffer the negative effects of acid rain on a plant more efficiently.</p> <p>Methods Materials: 6 purple flowering kale plants, 6 plant water catchers, sm. (plastic), 4 calcium carbonate pellets (260mg each), 1 tsp. (1200mg) of calcium carbonate powder, distilled water, 2 spray bottles with mist function (28oz.), vinegar, ruler, water pH testing strips, ? cup measuring cup, and ½ tsp. measuring spoon. Preparing the plants: I set up each plant in an individual water catcher and placed them in an area where each plant would get plenty of sunlight. I sprinkled ½ tsp. (600mg) of calcium carbonate powder on the top of the soil around the stems of two plants. I used a pill cutter to cut two calcium carbonate pellets (520mg) into fourths, and distributed the eight pieces somewhat evenly around the stems of two plants. Making the acid rain: I poured distilled water into a 28oz. spray bottle right up to the narrow neck at the top. Then I kept adding vinegar until the pH of the mist when sprayed at a pH strip read at a level 4 and I shook the bottle well. I repeated these steps for a second spray bottle. Performing the experiment: I filled the 1/3 measuring cup 1/2 way full with distilled water (1/6 cup) and watered each plant, pouring it over the soil and not the foliage, to make sure not to wash off the acid rain. I sprayed each plant 7 times with the mist function on, spraying from the top and around the sides to cover just the leaves with acid rain. I took notes on the condition of the plant s foliage and measurements of the plant s height in inches with a ruler and wrote them in my lab notebook each day. I repeated steps 1-3 every morning for nine days, then repeated steps 2 and 3 for five days until I saw clear results.</p> <p>Results The plants with calcium carbonate pellets did the best, with plant A growing 1 ¼ in. & plant B growing ¾ in. They were also in the best condition with all green foliage. The plants with no calcium carbonate did the worst, with plant A growing only ¼ in. & plant B growing 0 in. The plants with calcium carbonate powder did fairly well, both growing ¾ in.</p> <p>Conclusions My hypothesis was incorrect. The plants with calcium pellets did the best, not the plants with calcium powder. This is such an important topic because acid rain has horrible effects on the environment. I hope my project will help bring attention to the use of calcium carbonate pellets, a natural, efficient, and sustainable way to combat the many negative effects of acid rain.</p>	
Summary Statement The purpose of my project was to discover whether a pellet or powder form of calcium carbonate will work more efficiently to buffer the negative effects of acid rain on a plant.	
Help Received My mother and father read over my report once and made some suggestions of what I could add or change.	