



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Kylie L. Akiyama	Project Number 34752
Project Title Which Road Deicer Is the Best for the Environment?	
Abstract Objectives/Goals My objective was to find out which road deicer is the most beneficial for plants. My hypothesis was that the beet salt plants would grow to be the healthiest in height and weight. Methods/Materials To replicate what would happen in a real-life situation, five separate blocks of ice were melted with different deicers: magnesium chloride, calcium magnesium acetate (CMA), rock salt, and beet salt. The fifth ice block was the control. The resulting mixture of water and deicer was used to water radish plants. After 1 week of watering the plants, each of the four tallest sprouts were removed from their pots and placed in an oven for 8 hours, removing the water content. A triple beam balance was used to weigh the dry mass of the sprouts afterwards. Results When compared, the magnesium chloride proved to have the greatest average height and grew the most over the one week of watering with deicer, sometimes even greater than the control. CMA, rock salt, and beet salt fell behind in the measurements, with CMA shrinking the most. After being measured, the magnesium chloride weighed the heaviest along with the control. Conclusions/Discussion Using magnesium chloride is the best deicing method for plants. It provides essential nutrients for the sprouts, assisting their growth while also proving to be an effective deicer. Despite CMA companies claiming to be the most environmentally friendly, the results showed that the deicer had the most adverse effects on the radish plant. The rock salt and beet salt deicers are not as bad as CMA, still causing plants to wither, and are more practical for agencies who use millions of tons of deicer each year because of its inexpensiveness.	
Summary Statement My experiment was designed to determine which method of deicing roads would have the best effect on plants.	
Help Received Gina Osberg provided triple beam balance and magnesium chloride; Chad Lynch at Smith Fertilizer and Grain provided beet salt	