Name(s)

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Project Number

S2103

Project Title

Don't Be Salty! Testing the Reaction of Plants to Four Chloride Based Chemicals

Abstract

Objectives

The purpose of the project was to find a plant-friendly alternative to road salt (NaCl). Four types of salt were tested: calcium chloride (CaCl2), potassium chloride (KCl), ammonium chloride (NH4Cl), and road salt (NaCl). Dusty miller (Jacobaea maritima) plants were watered with the different salt types.

It was hypothesized that ammonium chloride (NH4Cl) would cause the least damage to the plants tested because it contains nitrogen, an essential plant nutrient.

Methods

The plants were watered with a solution made up of a rough 4:1 ratio of water to salt. Each week the height of the plants was recorded, as well as signs of dehydration in the plants.

Fifteen plants were used in this experiment. Three plants were used for each salt type, and the last three were watered using regular water. The impact of the salt was recorded by measuring the height of the plants. Signs of dehydration, such as wilting of the leaves, were observed. Over the course of several weeks, the data was recorded in a journal. After the data was collected, it was compared and graphed.

Results

The experiment was conducted for six weeks. The plants watered with the ammonium chloride (NH4Cl) and potassium chloride (KCl) shrank in height. The plants watered with the calcium chloride (CaCl2) solution shrank the most out of the four salt types tested. The plants watered with the sodium chloride solution grew the most out of the four salts tested. The plants watered with the NaCl solution did not show signs of dehydration that were as extreme as the other plants. The control plants grew in height. However, the growth was not as dramatic as that of the plants watered with NaCl.

Conclusions

As a result of the experiment, NaCl was shown to do the least damage out of the four chloride-based substances.

In future studies, more replication of the plants would be ideal. Testing different salts on the plants may also be interesting. The purpose of this experiment was to find an alternative to road salt (NaCl) that would cause less damage to the environment.

Summary Statement

The purpose of this project was to find a plant-friendly alternative to road salt (NaCl).

Help Received