How Does Salt Affect Burrowing

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Introduction

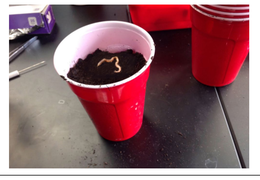
Many things can impact the health of organisms environments. For example, runoff salt in species that live in the ground. Our research question was to see the general effects of salt on worms. The reason this was relevant was because in today's world road salt, used for melting ice, is a very commonly used resource. However, it can leak into in the ground—an earthworms environment.

We used the experiment that was conducted in class as a backbone for our experiment, as it helped us come up with our own procedure for testing the salts.

Before conducting this experiment, we predicted that Duracube and calcium chloride would have the most impact on the worms, which was not accurate to our final results.

Materials and Methods

1. Fill your 2 plastic cups with potting soil. Do not pack it tightly, and leave 2 inches at the top.
2. Create a resting chamber by adding a clump of wet paper towel to a plastic container. Add 2 worms to the container.
3. Create your salt solution by using 1000 parts per million (0.1 g/100ml) in a large container.
4. Make a soaking chamber using two Petri dishes. Cut two 4" by 4" circular pieces of paper towel and place them in the dish. Add 3 ml of the salt solution (or control) to each piece of paper towel.
5. Remove the worms from the resting chamber and place one in each dish. Wait for 3 minutes and the move each worm to the plastic cups full of dirt.
6. Keep a flashlight above each cup, but dim it with your hand. Keep the worms in the cup for 5 minutes.
7. Record the data (amount of seconds spent burrowing).



Results

Calcium chloride doesn't affect fully burrowed time. Sodium chloride and Duracube don't affect worms burrowing, but have lower fully burrowed time. School road salt doesn't affect the worms burrowing. We used water as a control, the independent variable was how much time the worms were in the soil (5 minutes), and the dependent variable is how long the worms were burrowing.

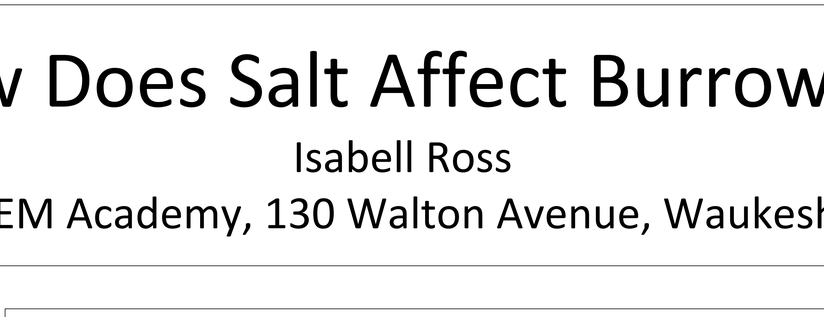
Abstract

We are testing how worms react to different types of salts. Specifically, how it affects their burrowing. By observing how the worm's burrowing behavior changes when they are exposed to different salts, the data will indicate what types should be avoided.

We tested by first exposing the worms to water mixed with the salt for 3 minutes, then leaving them in soil for 5 minutes to see if they would still burrow. Salts are very commonly used for melting ice in the winter, meaning they will also end up in the soil that worms live in and burrow in when the ice melts.

By testing the different types, we found out that each salt used at the right concentration will not affect the worms. This is good because it means when the salt is in the ground worms will still survive.

Data Presentation



Our graphs show data for each salt type. Sodium chloride (top left), calcium chloride (top middle), Deracube (bottom left), water/control (bottom right), and school road salt (top right). They each show the four trials for each different salt, and the time the worms were burrowing. The blue lines represent the time they were not burrowed at all, red represents partial burrowing, and yellow is the time the worms were fully burrowed.

Data Analysis

We used an analysis of variance (ANOVA) test ($p \leq 0.05$) because we used more than two test groups in our experiments. Our data showed that there not a significant difference in burrowing behavior between the salt and burrowing time and the control. The p-value was 0.153 which support the null hypothesis that there is no difference between variables tested.

Discussion

For this project, we wanted to see how different road salts affected worms and their burrowing behaviors. We consulted our teacher about what salts we have available and compared that with different roads salts used. We ended up choosing four different types of salt; calcium chloride, sodium chloride, duracube, and school road salt.

Since road salts are used all over the country to help combat the natural effects of heavy snows and cooler temperatures, we figured that the extreme use of road salts might have an effect on worms and their behavior. We wondered if worms are affected by the salts used and wondered which one had the least effect on their burrowing behaviors or how the react to them.

Our hypothesis was that the duracube and calcium chloride would affect the worms and their burrowing behavior the most. It also included that the road salts and sodium chloride wouldn't have that much of and effect on the worms.

We tested each salt and calcium chloride had the least effect on the worms, contrary to our hypothesis. On the other hand, sodium chloride had the most effect on them. Then school road salts and duracube where in the middle of the two.

When we studied our statistics, we found that their wasn't a big difference in their behavior from our control to our variables.

Some of our limitations when doing this experiment was that we weren't able to test for as long or as many worms. This means that our experiment might not accurately reflect how worms do react to different salts in real world situations.

If we were to do this experiment differently, we would use a bigger variety of worms to see the different effect on each type of worm.

Works Cited

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