CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

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Project Number

36699

Project Title

Analysis of the Solubility of Different Types of Toilet Paper in Water and Septic Solution

Abstract

Objectives/Goals

To see what toilet paper dissolves most in water or water and septic tank treatment. The hypothesis was that 1-ply toilet paper would dissolve the most and the flushable wipe would dissolve the least.

Methods/Materials

Various toilet paper and flushable wipes were cut to similar mass and put in containers. 500 mL of water was placed in 9 containers. Septic tank treatment was added to 4 of the containers. The containers were shaken for 1 minute, then the contents were poured through a septic filter. The filtered toilet paper was collected and then filtered through a micro filter. Each micro filter with toilet paper was massed when dry. A second trial was done for verification.

Results

The experiment showed that toilet paper dissolves best in water. I recovered 94% of the 1-ply toilet paper, 69% of the 2-ply, 61% of the 3-ply, and 8% of the flushable wipe in water. In the septic solution, I recovered 76% of the 1-ply, 62% of the 2-ply, 46% of the 3-ply, and 3% of the flushable wipe. Possibly, the septic solution needs more time for dissolution. My control of water showed a 1% increase in mass. While I washed my materials with water between trials, it was difficult to see toilet paper stuck to the filter, pipe, and container. Possibly, small particles of toilet paper, PVC pipe, or tree droppings accounted for this 1%. It is also possible water was trapped in the micro filter and had not evaporated. Salts and metals in the water could have also affected my results.

Conclusions/Discussion

The toilet paper with the greatest percent recovered was the 1-ply toilet paper. 94% of the 1 ply toilet paper in water was recovered and 76% of the 1-ply toilet paper in septic solution passed through the filter. As the ply increased, the filtered toilet paper recovered decreased. The least percentage recovered was Kirkland#s flushable wipe in septic tank treatment. My results disagreed with my hypothesis that the septic solution causes more breakdown. I am unsure if the treatment needs more time, a normal septic environment, or if it doesn#t increase dissolution. Based on the results, I suggest that people use 1-ply toilet paper if they have a septic system. This toilet paper broke down the best, filtered through an effluent filter the most completely, and is less likely to clog a leach system due to solubility. I would not add a chemical additive to a septic system without further research.

Summary Statement

This project looks at the solubility of different plies of toilet papers in two different solutions and their effects on a septic system.

Help Received

My parents poured the water and filtered toilet paper into the filters while I held them. They also helped me take pictures to create photo displays of my project and showed me how to graph my results on a computer.