



Smart STEM Challenge

Investigate the Effects of Using Biodegradable Materials as Organic Fertilizers on Plants Growth

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ABSTRACT:

The 21st century is one of the most pivotal time periods within the history of Earth, bearing fruit to the rapid development in industry and technology. The development of such innovations are meant to make the way of life much simpler and more productive. An example of this is seen in agriculture and the popular use of inorganic fertilizers. There are many significant benefits that come with using inorganic fertilizers such as an increase in productivity, improvement in poor soil conditions, improvement in soil texture, etc. These benefits, unfortunately, help overshadow the looming risk of pollution that is a rather destructive effect of inorganic fertilizer usage. A question addressed by many because of the problem above is “What alternative can people use as to give as much productivity as the use of fertilizers but with a rather prominent decrease in risks?” The question above helps fuel the start of the project further described below. The project will target farmers within Cambodia as the problem above is rather eminent within the country. It helps put into perspective the benefits of using biodegradable materials that usually end up getting burned or thrown away through investigating the effects of them on plants’ growth. The materials used include cardboard, eggshells, sugarcane residue, and paper towels (independent variable) and they’re degraded into soil to see how they affect the growth of green beans and morning glory (dependent variable). We hypothesized that the seeds will grow best in a mixture of sugarcane residue, for it contains many different kinds of elements essential for plant growth such as nitrogen, potassium, and sodium in comparison to other degradable materials used. The project supports our hypothesis since under the same conditions, green beans grew the biggest in a mixture of sugarcane residue compared to other materials; all four seeds sprouted and reached a growth of 6 centimeters, 7 centimeters, 5 and 5.5 centimeters providing an average of 5.875 centimeters. Though morning glory grew best in a mixture of cow dung only, they also grew well in the mixture of sugarcane residue. The seeds were able to reach heights of 2, 4, 3.5, and 0.5 centimeters, giving an average of 2.5 centimeters. Although this project is arguably trivial and simple, it’s a stepping stone to providing a solution to solving the issue regarding pollution, thus creating a more sustainable way to grow plants.

