

The Effect of Music on Plant Growth

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Introduction

Research Question:

How will music affect the growth of a plant

Background

Plant growth is the development of seeds of a plant, which might be surrounded by a protective and nutrient rich layer called the fruit, into plant tissue that includes roots, leaves, and the stem (along with all the cells and other things that this tissue is composed of) to create a fully functioning, living, multi-cellular, eukaryotic organism that lacks the ability to move (a plant). Their growth is affected by several factors that include soil moisture, soil pH, sunlight, nitrogen-content of the soil and more. If some these factors are affected in negative ways, then there can be some negative outcomes on the plant itself which could include death.

Music might also be one of these affecting factors. In this experiment, two very young plants (pinto bean sprouts - *Phaseolus vulgaris*) will be planted at the same time and will have the same amount of everything; from sunlight to the amount of water they get daily. After they have grown a little and the stem has begun to emerge from within the cotyledons of the bean, they are then separated, and one plant sits in the peace and quiet as a control while the other is subjected to some serious loud music. If conditions are right, the music should stimulate the plants growth.

Hypothesis

If a pinto bean sprout (*Phaseolus vulgaris*) plant is grown in a quiet area and another pinto bean sprout is grown in an area with loud music playing, the plant in the area with music will grow to be much larger.

The amount of growth will be measured with a metric ruler in centimeters

Variables

Independent Variables:

Temperature, Light, Water: These three factors are equally distributed among both plants, so only variable that would affect plant growth is the music played.

Type of Plant and soil: same type of bean sprout used for both plants as to ensure that there are no other variables other than the music being played for the plant along with the same type of garden soil

Dependent Variables:

The height of both plants after a day of one plant being exposed to silence and the other to music

Control of Variables:

1. Get to pinto beans (*Phaseolus vulgaris*) to be grown that are identical to ensure no other affecting variables in this experiment other than the music being played.

- Expose both plants to identical conditions of moisture, temperature, sunlight and have both of them grow in the same type of garden soil and they will be grown in containers with the same size as well.
- For the plant being exposed to music, the same album is played over and over so the type of music is consistent.

Materials and Method

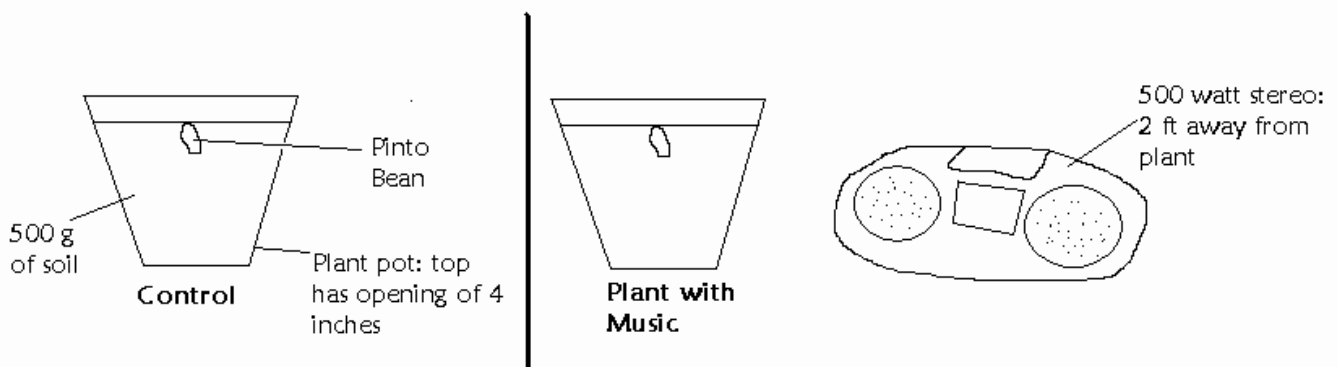
Materials

2 pinto bean sprouts (*Phaseolus vulgaris*)
 2 plant pots – top opening is 4 inch diameter
 500 watt stereo
 Linkin Park Album – Hybrid Theory

180 ml of water
 2x '500g' of garden soil
 Metric Ruler
 100 ml graduated cylinder

Method and Procedure

- Take the 2 plant pots and fill them each with 500 g of garden soil
- Then, take a pinto bean and plant it in each of the pots; plant each bean so that it is just barely submerged under the soil.
- Then, take each pot to a different location, but a location in which both plants will be exposed to the same amount of sunlight, heat, etc...
- Then, just leave one plant in the serenity of its surroundings (it's the control) and place the 500 watt stereo next to the other plant. Put the CD into the stereo and have the stereo play at about three-fourths its full volume and have it play next to the plant and have it play for a minimum of 7 hours next to the plant. *Look at the diagram below for more information.*
- At noon give both plants 30 ml of water using the graduated cylinder. Do this again at 6 p.m.
- The next day, note your observations and record your findings in a table.
- Then feed the plants again and play the music for at least 7 hours and record the observations once more the next day.



SETUP

Data Collection and Evaluation

Table: The effect of music on plant growth

Day	Plant without Music	Plant with Music
1	The plant had sprouted and a small stem began to appear- 2 cm in length	The plant had also sprouted and a stem larger than that of the other plant's appeared- about 2.47 cm
2	The plant continued to grow and the stem had reached a height of approximately 3.22 cm	The plant's stem also continued to grow but the stem had now reached a height of about 3.85 cm

Data Evaluation

From the numbers and observations presented in the above data, that as time passed and the plants were closely monitored, the plant that had the music playing seemed to grow a lot more than the plant that grew in the quiet and serene environment; the quiet plant ended with a height of 3.22 cm while the plant with music ended with a height of about 3.85 cm.

Conclusion and Evaluation

Conclusion

In the above data, it is deciphered that plants that grow with music grow much more than plants that grow in a quieter environment. This all has to do with the fact that different factors affect or stimulate plants, and sound is one of them. And, from the data, sound is a positive stimuli as it increased plant growth in one of the plants. This verifies the hypothesis and, since there are other results on the internet as well to verify that music really does stimulate plants, the results are plausible and reliable

Limitations

Not everything can go according to plan or as hoped and so these errors that occurred during the experiment provide a basis from which the experiment can be proved:

1. There was only one trial instead of several and the experiment in this one trial was over a 48 hour period and it should have been longer so that the true comparison of the difference between a plant grown with music and a plant grown without music can be easily made.
2. Only one type of music (rock) was used and so it is now unknown whether different kinds of music and sound also act as a different stimulus for the plant.

Suggestions for Improvement

To create a much better and more reliable experiment, the experiment should be carried on for about a 4 day period in order to acquire more results than can show the differences between plants with and without music. Then, there should be at least 3 different plants; one control, one with a type of music, and another with a different type of music. This then will help to go deeper and explore this stimulus of sound toward plants on different

levels. This entire experiment should then be at least repeated one more time to ensure plausible results.

Bibliography

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