Scotts vs. Garden-Tone

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Intro

For my experiment, I tested two different fertilizers on two different lima bean seeds. One of the fertilizers was Scotts and the other was Garden-Tone. I also used a control plant which received no fertilizer. Prior to planting my seeds in the soil, they were thriving, as evidenced by the hypocotyl for each of the plants rising above the soil.

An experiment such as this is important to help find which fertilizers work best on small plants such as house plants or garden plants. This helps the home gardener grow plants more productively and more efficiently.

Hypothesis

My hypothesis was the following: the plant with Garden-Tone is going to grow larger than the plant with Scotts because the Garden-Tone fertilizer contains more nitrogen.

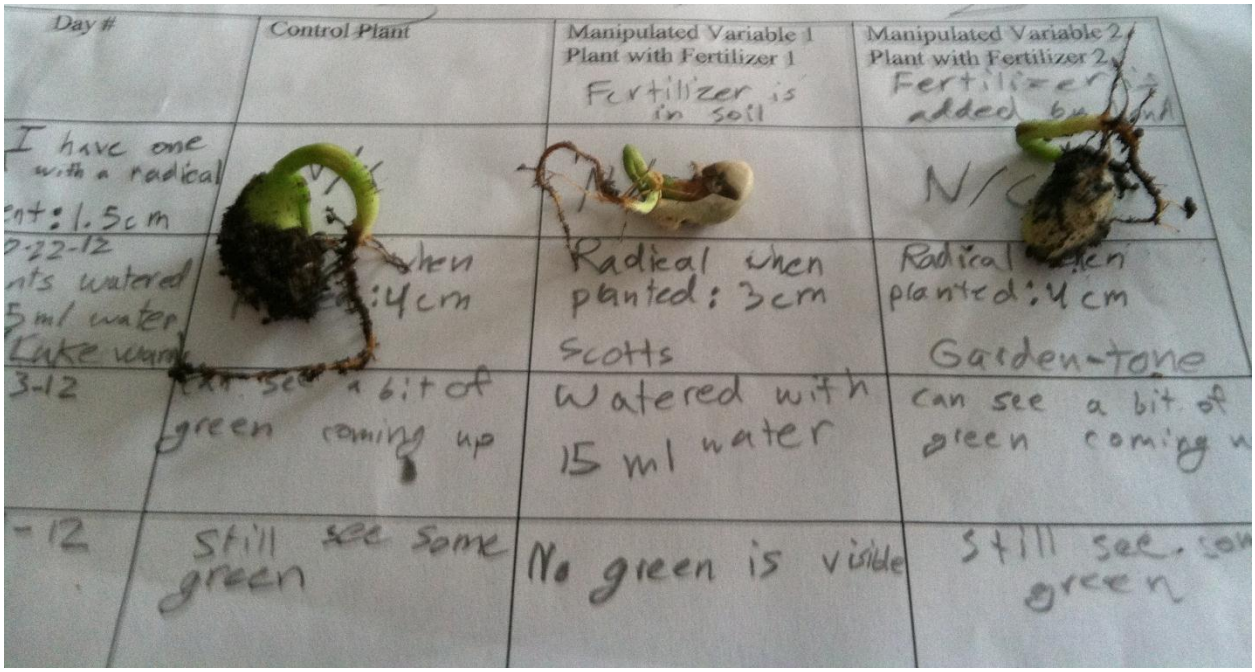
Operational Statement

Materials

1. Luke-warm water
2. Soil
3. 1 petrie dish with 1 moistened paper towel
4. 3 small terracotta pots
5. Fertilizer 1 – Scotts
    a. Nitrogen----------0.07%
        i. Ammoniacal nitrogen-------0.04%
        ii. Nitrate nitrogen----------0.03%
    b. Available phosphate (P_2O_5)----------0.01%
    c. Soluble Potash (K_2O)----------0.03%
6. Fertilizer 2 – Garden-Tone
    a. Nitrogen----------3.00%
        i. Ammoniacal nitrogen-------0.20%
        ii. Other waste sol. nitrogen---0.60%
        iii. Water insoluble nitrogen—2.20%
    b. Available phosphate----------4.00%
    c. Soluble potash----------4.00%
    d. Calcium----------5.00%
    e. Magnesium----------1.00%
    f. Sulfur----------1.00%
7. 3 lima bean seeds

Methods

First, I took four lima bean seeds, and put them in a petrie dish with a moistened paper towel. The dish was placed near a window with sunlight. Once the seeds grew their hypocotyls, three of the seeds were transferred to three separate terracotta pots. Pot 1 contained soil pre-mixed Scotts fertilizer. Pot 2 contained normal soil to which I manually added Garden-Tone fertilizer. Pot 3 contained normal soil with no fertilizer. In this experiment, the manipulated variables are the two fertilizers. The responding variables are the lima bean plants. My operational definition of plant growth is measurement of the plants in millimeters.



Analysis

I was not able to determine if the fertilizers had any effect on my plants because none of the plants grew much after they had been planted in soil. I originally stated in my operational definition that I was going to water my plants on Monday, Wednesday, and Friday. I did not do this however because it looked like my plants had enough water. The most likely explanation as to why my plants did not survive is that I did not water my plants often enough. Out of the two week period, I watered the plant with fertilizer 1 four times and the control plant and plant with fertilizer 2 three times. If I had watered the plants before the weekend instead of after, they may have done better.

Conclusion

In a future experiment, I would water the plants every other day. I would also water each plant the same amount. I would research ahead of time the recommended amount of water required by lima bean plants. Keeping the plants near the window provided adequate sunlight, so this should not have been a factor.

Although I did not accomplish my goal of determining which fertilizer best stimulated the lima bean plant's growth, I believe future experimentation would be worthwhile.

DataChart

Day #	Pot 3 Control Plant No fertilizer	Pot 1 Manipulated Variable 1 Plant with Fertilizer 1 Scotts Fertilizer in soil	Pot 2 Manipulated Variable 2 Plant with Fertilizer 2 Garden-Tone Fertilizer added by hand
Day 1 Oct 19 One seed has a radical Measurement: 1.5 cm	Not yet planted	Not yet planted	Not yet planted
Day 2 Oct 22	Radical when planted: 4 cm Watered with 15ml water	Radical when planted: 3cm Watered with 15ml water	Radical when planted: 4cm Water with 15ml water
Day 3 Oct 23	Could see a bit of green coming up (hypocotyl)	No hypocotyl visible Watered with 15 ml	Could see a bit of green coming up (hypocotyl)
Day 4 Oct 24	N/C	N/C	N/C
Day 5 Oct 25	Hypocotyl has risen further	Hypocotyl has risen further	Hypocotyl has risen further
Day 6 Oct 26	N/C	N/C	N/C
Day 7 Oct 29	N/C Watered with 5ml water	N/C Watered with 5ml water	N/C Watered with 5ml water
Day 8 Oct 30	N/C	N/C	N/C
Day 9 Oct 31	N/C Watered with 5ml water	N/C Watered with 5ml water	N/C Watered with 5ml water
Day 10 Nov 1	N/C	N/C	N/C
Day 11 Nov 2	N/C	N/C	N/C

Growth Chart