

Look at Them Grow
Determining Whether Chemical Fertilizer Works Faster Than Organic Fertilizer
Lake Eola Charter School, 7th Grade.
Mr. Madewell

Rationale

People use organic fertilizers based on the assumption that they are better for the plants and the environment. But do they work faster than chemical fertilizers at helping plants grow? Based on my research, chemical fertilizers, though they may be less healthy for plants and the environment, may work faster. My research is designed to determine whether that's true, using lima bean plants.

Hypothesis

Based on my research, I hypothesize that even though organic fertilizers may work better in the long run, chemical fertilizers will work faster on lima bean plants.

Materials

- o Water
- o Lima beans (27 - 3 for each planter)
- o 9 planters and trays
- o Potting soil
- o 15 milliliter beaker
- o Miracle-Gro Water Soluble All-Purpose Plant Food
- o Jobe's Organics Fast Start Granular
- o Gardening gloves
- o Plant stakes (only if lima bean plants get too tall to stand up straight)
- o Ruler • pen o Science Fair notebook

Procedures

1. Put 1.5 liters of potting soil in each of the nine planters
2. Mix 20 milliliters of Jobe's Organic in each of 3 planters
3. Leave 6 planters with no fertilizer (3 will be watered with Miracle-Gro mixture; the other 3 will be controls)
4. Soak lima beans for 15 min.

5. Plant 3 lima beans 1 1/2 inches deep in each planter
6. Mix 2.5 ml of Miracle-Gro into 3.75 liters of water
7. Water one set of lima beans (3 planters) with 15 milliliters of the Miracle-Gro/water mixture (based on previous Science Fair research, Bean Brainiac, that found 15 milliliters daily is the best amount of water for lima beans).
8. Water the Miracle-Gro set with 15 milliliters of water every day
9. Every two weeks, repeat steps 6 and 7
10. Water the remaining sets of lima beans with 15 milliliters of water every day
11. At the same time each day, measure how tall each lima bean plant is getting
12. At the same time each day, measure how many lima beans sprout in each plant
13. Record measurements in science fair notebook
14. Repeat steps 10-13 for a period of 6 weeks
15. Record total data

Data Analysis

I will create graphs to show the differences and similarities in the growth of the plants

Risk and Safety

I will follow the safety precautions on the MSDS for my fertilizers.

Bibliography

1. Day, Julie. "Pros and Cons of Organic vs. Chemical Fertilizers." Today's Homeowner, Danny Lipford, www.todavshomeowner.com/debate-over-organic-chemical-fertilizers/.
2. "Organic Fertilizer." Kellogg Garden Products,
3. Miller, Renee. "Inorganic Fertilizer Vs. Organic Fertilizer." Home Guides | SF Gate, homeguides.sfgate.com/inorganic-fertilizer-vs-organic-fertilizer-39528.html.
4. Savonen, Carol. "Chemical versus Organic Fertilizers?" Oregon State University Extension Service | Gardening, 12 July 2006, extension.oregonstate.edu/gardening/chemical-versus-organic-fertilizers.
5. "Miracle-Gro® Water Soluble All Purpose Plant Food." Miracle-Gro Water Soluble All Purpose Plant Food - Plant Food - Miracle-Gro, Miracle-Gro, www.miraclegro.com/en-us/products/plant-food-care/miracle-gro-water-soluble-all-purpose-pl

6. MSDS Miracle Gro. July 12, 2006 <https://www.oregon.gov/ode/educator-resources/standards/science/Documents/Current-Lesson-Materials-MS/msds-miracle-gro.pdf>
7. "Jobe's Organics Fast Start Granular." Jobes Company, jobescompany.com/product/jobes-organics-fast-start-granular/.
8. MSDS Jobe's Organic Spikes July 14, 2006 <https://images.homedepot-static.com/catalog/pdfImages/b9/b9ab4000-a292-4e80-bc4a-2ef27e7d3968.pdf>
9. Rules and Regulations for Science Fair July 2006
<https://sspcdn.blob.core.windows.net/files/Documents/SEP/ISEF/2006/Rules/Book.pdf>