SCIENCE EXPERIMENT

Testing whether plants can communicate through underground fungi

Name: _____

Date: _____

Notebook Page: _____

QUESTION: Can plants communicate with each other through underground fungi (mycorrhizae)?

HYPOTHESIS: **If two plants are connected by underground fungi, then a stressed plant will send a warning through the fungi and the other plant will respond (for example, by changing growth).**

MATERIALS

- 4 small pots
- Potting soil (sterilized if possible)
- Mycorrhizal inoculant (contains live mycorrhizal fungi)
- Fast-growing plants of the same kind (e.g., bean, pea, or radish)
- Clear plastic barrier (plastic wrap or sturdy plastic) to prevent root contact
- Small tray to hold the pots
- Watering can
- Salt (table salt) or diluted white vinegar (5%)
- Ruler
- Notebook

EXPERIMENT SETUP

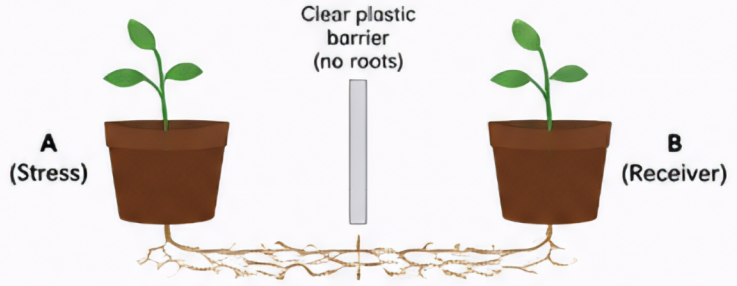
1. Label four pots: A, B, C, and D.
2. Fill all pots with the same soil.
3. Mix mycorrhizal inoculant into the soil of pots A and B.
4. Do NOT add mycorrhizae to pots C and D (these are the control group).
5. Plant one seedling in each pot.
6. Arrange the pots in two pairs:
   - **Pair 1 (With Fungi):** Pots A and B
     The roots must not touch. Place a clear plastic barrier between the pots (no holes).
   - **Pair 2 (No Fungi Control):** Pots C and D
     Use the same barrier between the pots.
7. The barrier prevents roots from growing between the pots. Any communication would have to be through the fungi in Pair 1.

PROCEDURE

1. Water all plants equally and place them in the same location with the same light.
2. Let the plants grow for 7 days so the fungi can establish.
3. Apply stress to one plant in each pair (Pots A and C):
   - Add 1 teaspoon of salt dissolved in 100 mL of water to the soil of Pots A and C. (Or use 50 mL of 5% vinegar.)
   - Do this once.
4. Do not stress Pots B or D.
5. Observe all plants daily for 7 days.
6. Measure the height of all plants each day.
7. Record observations in the table.

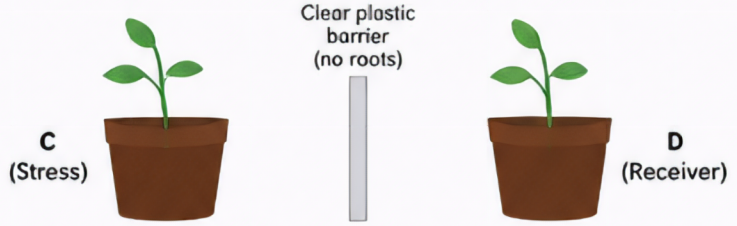
EXPERIMENT DIAGRAM

Pair 1: With Mycorrhizal Fungi (Test Group)



Mycorrhizal fungi in the soil connect the plants

Pair 2: No Mycorrhizal Fungi (Control Group)



Important: *Keep all other conditions the same for all pots (light, water, temperature, soil, and time).*

DATA & OBSERVATIONS

Day	Plant Height (cm)				Observations (leaf color, wilting, growth changes, etc.)
	A (Stress)	B (Receiver)	C (Stress)	D (Receiver)	
0 (Before stress)					
1					
2					
3					
4					
5					
6					
7					

ANALYZE YOUR RESULTS

- Did Plant B (receiver with fungi) show any changes after Plant A was stressed? Describe.

  _____

- Did Plant D (receiver without fungi) show any changes after Plant C was stressed? Describe.

  _____

- What does this suggest about the role of fungi?

  _____

  _____

CONCLUSION

Did the results support your hypothesis?

( ) Yes ( ) No

Explain your conclusion.

_____

_____

_____

EXTENSION IDEAS

- Repeat the experiment with different types of stress.
- Test with different plant species.
- Research how mycorrhizal fungi help plants in nature.