The Crucifer Cross

Gravitropism Revisited

Despite ongoing research efforts by plant physiologists there is still much to learn and study in the area of plant responses to gravity, or *gravitropism*. For this very reason we feel that this is an excellent topic for students to explore.

This activity utilizes both the rapid response time of Wisconsin Fast Plants to changes in the environment and the microtechnology of Bottle Biology in film cans. Two to three hours after setting up your film can gravitropism chamber you should be able to observe results which will keep you wondering!

Materials

- 35 mm opaque film can with lid
- extra film can lid
- double-stick foam tape (mounting tape)
- eye dropper or small pipette
- paper toweling (Scott towels work well)
- three day-old Fast Plants seedlings

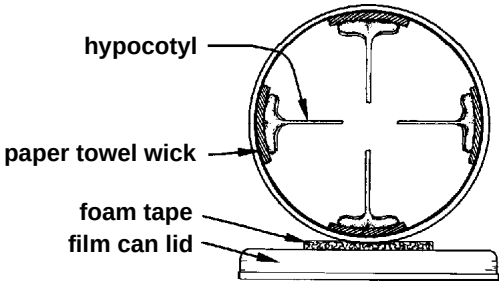
Chamber Construction and Tips

1. Tape a film can lid to the side of a film can using the double stick foam tape. This lid acts as a pedestal for the can allowing it to sit on its side without rolling around.

2. Fold and cut a piece of paper towel to produce small wick strips which are approximately 4.5 cm long and 1.0 cm wide.

3. Pre-moisten four wicks with several drops of water and place them along the inner sides of the film can so that there is one wick each on the top, bottom and both sides of the can when it is placed on its pedestal. Each wick can be slid in and out of the can by gently pushing or pulling it with the sharp tip of a pen or pencil.

Figure 2: Cross-section view of chamber



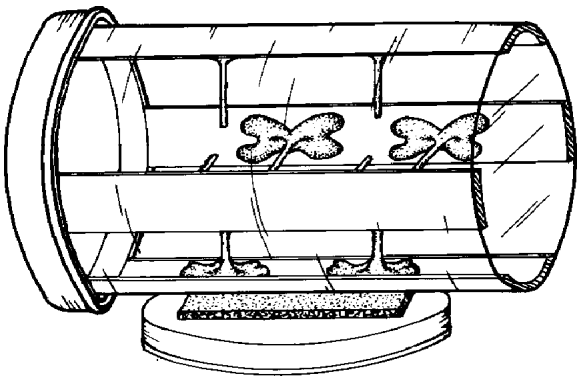


Figure 1: Film can gravitropism chamber

4. Cut eight three day-old Fast Plants seedlings at soil level leaving the small stem *(hypocotyl)* and seed leaves *(cotyledons)* intact. Stick two of these seedlings onto each wick by placing the cotyledons against the wick. The water on the wick should hold the seedling in place. If the plant is reluctant to stick, you may need to add an additional drop of water on the wick.

5. Add a couple of drops of water to the bottom of the film can when all of the plants are in place and put a lid on the can. Make sure the ends of the wicks don't protrude out of the can. The extra drops of water in the can should keep the air in the can moist. This will prevent the wicks from drying out.

6. Place the chamber in a warm (but not hot) location, a Fast Plants light bank works well. After 2 to 4 hours, gently remove the lid and observe the orientation of the hypocotyls. Continue your observations for the next five to seven days. Keep your eye out for new growth of your seedlings!

Note: This construction is called "The Crucifer Cross" because Fast Plants belong to the botanical family of crucifers and the seedlings in your film can form a four-way cross.

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