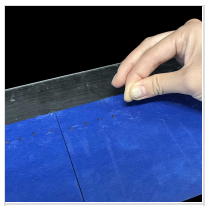

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Slant board seed gemination and transplanting for hydroponic research

noah.langenfeld [1], Bruce Bugbee[1]

[1]Utah State University

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USU Crop Physiology Laboratory

noah.langenfeld

Uniform seed germination is essential for hydroponic research. Conventional seed germination uses substrates such as peat moss or mineral wool. These substrates are difficult to remove from the roots and can lead to unwanted particulates in the nutrient solution following transplanting. Removal of substrates prior to transplanting damages fine root hairs and stunts growth. Germinating seeds on a slant board eliminates these problems. Root growth on a slant board is uniform, unobstructed, and reduces the time to transplanting. The long and straight roots also maximize the exposure of the taproot to the nutrient solution. The slant boards are made from vertically oriented acrylic sheets with germination paper on top. Seeds are held in place by thin cellulose paper. Seedlings can be transplanted with long, clean roots free from damage to root hairs. Here, we provide an overview of slant board construction and use for rapid seed germination and transplanting into hydroponic systems.

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- Seeds
- 2 mm thick acrylic board
- Germination blotter paper
- Single-ply cellulose paper (Kimwipes)
- Acrylic holder
- Exterior container (plastic storage tote)
- Water

Seeding

1 Obtain a clean acrylic slant board and lay flat on a hard, clean surface.

2 Cut a piece of germination paper 10 cm in height and the same length as the slant board.

3 Place germination paper on top of slant board.

4 Place seeds on top of germination paper (about 9 cm from the bottom of the board and 1 cm from the top of the germination paper) in a line parallel to the top and bottom of the slant board. Seeds should be about 5 mm apart.

5 Place a single layer of cellulose paper (Kimwipe) over the seeds.

6 Gently wet the entire germination board and Kimwipes with tap water to lock seeds and paper in place on the board. A squirt bottle works well for this process. Do not use nutrient solution.

7 Transfer the slant board into the exterior container. The angle of the board should be between 70° and 80°.

8 Fill the exterior container with tap water until the water level is about 2 cm above the bottom of the germination paper.

Monitoring and transplanting

9 After at least one cotyledon leaf has appeared, gently peel back the Kimwipe to expose the leaves. The Kimwipe should remain covering the roots.

10 After the roots have grown long enough to reach the solution, remove the seedlings from the paper. Fingers or a tweezers can be used to remove the seedlings from the paper. Avoid excessive pressure to prevent root breakage.

11 Place the seedling inside a neoprene collar. Ensure the roots are not pinched in the collar. The cotyledons can be used to support the seedling and stop it from falling into the solution.

12 Place the neoprene collar with the seedling into the main culture tank. Ensure to roots are able to reach the nutrient solution to avoid desiccation.