

Germination Platform for Cost-Effective Plant Production

A simple system that efficiently yields high-quality plants with straight roots via somatic embryogenesis

This simple and inexpensive germination platform enables the cost-effective production of plant propagules from micropropagation through storage, desiccation, germination, and planting. The platform works with varied plant propagules developed through somatic embryogenesis, including somatic plant embryos and seeds.

The innovation consists of a foldable circular paper disk and a hollow tube. The paper disk encircles the plant embryo or seed such that it is oriented longitudinally. The folded disk is then placed inside the tube such that the root end points axially. The tube is housed in a perforated plate that can hold from a few to a few thousand tubes. The entire assembly is then placed inside a sealed container that can be kept sterile, if needed, throughout desiccation, germination, and planting.

Georgia Tech researchers demonstrated the platform and method using tubes made from stereolithography. After soaking in liquid germination medium for two weeks within the assembly, the seeds developed roots and shoots inside the tubes. In addition to producing high-quality straight roots, this platform and method also enables the coupling of tube-containing embryos to planting systems, eliminating a time-consuming and risky process.

Summary Bullets

- **Cost effective:** Simply and inexpensively produces large numbers of high-quality plants from somatic embryogenesis
- **Convenient:** Permits easy handling and transport of germinated propagule
- **Practical:** Produces high-quality straight roots

Solution Advantages

- **Cost effective:** Simply and inexpensively produces large numbers of high-quality plants from somatic embryogenesis
- **Convenient:** Permits easy handling and transport of germinated propagule
- **Practical:** Produces high-quality straight roots
- **Flexible:** Works with numerous plant propagules, including somatic plant embryos and seeds

Potential Commercial Applications

This apparatus is useful for automating numerous and varied parts of plant production from somatic embryogenesis, including but not limited to:

- Storage
- Desiccation
- Germination
- Planting

Background and More Information

The use of cuttings is a well-established method for propagating plants, and it is well-known that some plants are easier to propagate than others. Eucalyptus and poplar are two examples of trees that are propagated by cuttings with little difficulty. However, because conifers such as pine, spruce, and lark are difficult if not impossible to propagate this way, growers use somatic embryogenesis techniques for large-scale propagation efforts. Yet, there is a high risk that the root of the plant propagule will be damaged when planting in substrate material.

Georgia Tech's method is designed to lessen this risk because the plant embryo is surrounded by a protective tube throughout the process.

Inventors

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Publications

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