UMSL Innovations
University of Missouri–St. Louis

Greater Stress Tolerance in Plants & Crops

A non-GMO technology that enables plants to produce more lateral roots, thereby enhancing their resistance to conditions such as drought, low nutrients and other stressors.

Category
Plant & Life Sciences

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The Technology

Water shortages are responsible for the greatest crop losses around the world and are expected to worsen. While solutions exist to improve the survival of drought and other stress factors, many such solutions rely on genetic modifications, have shown only minimal improvement, and produce low yields.

This technology involves growing plants in nutrient media containing synthetic amphiphiles (such as hydraphiles, lariat ethers, and lariat ether amides), which induces a change in the root morphology of the plants. Instead of growing a single primary root, the plants form multiple lateral roots, enhancing their resilience to adverse conditions such as drought, cold, or low nutrients.

Problems Solved

- Addresses the challenge of growing plants in unfavorable conditions
- Overcomes limitations of plants having single primary roots and no or few lateral roots under normal conditions

Market Applications

- Agriculture, especially for crops grown in challenging environmental conditions
- Botanical research and environmental conservation efforts

Key Advantages

- Increases the resistance of plants to harsh environmental conditions
- Stimulates the development of multiple lateral roots, improving the plant's water and nutrient absorption capabilities
- Allows for precise control and quantification of root morphology changes

Development

- Early testing has been performed on plant model systems, and the compound is ready to be experimented in more beneficial crop systems
- Cytotoxicity data is available and has shown the product to be safe in mammalian cells
- The University seeks a commercial partner to bring this product to market through collaboration and licensing

IP Protection: U.S. Patent No. 10,548,319 (issued 02/04/2020)

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