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Investigating the Use of Walnut Tree-based Chemicals and Industry Byproducts as Natural Urease Inhibitors

An inexpensive, natural, and eco-friendly urease inhibitor derived from walnut and pecan trees increases fertilizer efficiency while reducing costs and environmental problems.

Researchers at Purdue University have developed a urease inhibitor that improves the efficiency of fertilizers. Urease is an enzyme commonly found in plants, fungi, and bacteria that converts urea-based nitrogen fertilizer into ammonia and carbon dioxide. However, ammonia volatilizes to the atmosphere and most of the nitrogen absorbed by plants is in form of nitrate. Therefore, urease inhibitors can improve fertilizer efficiency. The Purdue researchers' urease inhibitor traps ammonia at a depth of ~5-10 cm and mineralizes it as plant-usable forms. Unlike the industry-standard urease inhibitor (NBPT), the Purdue researchers' inhibitor is inexpensive, natural (derived from walnut and pecan trees), and eco-friendly. This technology can benefit farmers and any agricultural operations by increasing fertilizer efficiency, reducing costs, along with reducing environmental problems caused by excess of fertilizers.

Technology Validation: A 100 microliter assay containing 50 microliters of extract from green walnut husks inhibited ~70% of urease activity.

Advantages:

- Inexpensive

- Natural

- Eco-friendly

- Mitigate excessive use of fertilizers

Applications:

- Urease inhibitor to improve fertilizer efficiency

Technology ID

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Category

Agriculture, Nutrition, & AgTech/Precision Agriculture & Smart Farming

Agriculture, Nutrition, & AgTech/Regenerative Ag & Soil Health

GreenTech/Environmental Remediation & Pollution Control

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- Agricultural Practices

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Intellectual Property:

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