

Title: “There must be something in the water: Hydroponics is finding a place in modern plant science”

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Hydroponics is a form of plant science that has changed how we can grow and research plants.

In traditional gardening and agriculture, plants receive most of their nutrients from the soil. However, hydroponics is characterized by growing plants without soil and instead using nutrient-rich water solutions.

“In hydroponics, we are essentially providing 100% of the nutrients to our plants through fertilizers or fertilizer solutions,” says Noah Langenfeld, a Ph.D. student in plant science at Utah State University.

The science of hydroponics is older than it appears. Several have studied hydroponics throughout the centuries. Some researchers even speculate that the ancient Hanging Gardens of Babylon were created through hydroponics. In the 1930s, William Gericke, a researcher from the University of California, worked extensively on growing plants with nutrient-rich water and eventually coined the term hydroponics.

Most crops can be grown hydroponically. However, for some crops, such as corn, wheat, soybeans and rice, hydroponics is not economically efficient. Hydroponics is mainly used for specialty crops and is easily done with leafy green plants and fruity crops.

“The things that we learn in hydroponics can be applied to a lot of agriculture; agriculture systems that we currently have,” Langenfeld says, “but they're not going to necessarily be a replacement for those.”

Langenfeld explains that hydroponics has proved very useful in plant research practices. To study the roots of a plant grown traditionally in the soil, researchers face several challenges. Removing the dirt is time-consuming. Even after investing such time, it is unlikely that all the dirt particles will be removed. While trying to remove the dirt, researchers risk damaging the very roots they are trying to study. Hydroponics mitigates those challenges by removing the dirt.

Langenfeld's research specifically focuses on the sustainability of hydroponics by reusing the same fertilized water solutions for multiple crop cycles. This can reduce the waste of water and nutrients.

"That's where I really see the future of this going is sustainability and the recyclability of either solutions or substrates like this," Langenfeld says.

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