The Cross Section

New Innovations: Responsive Drip Irrigation Systems

March 23, 2020

EDITOR'S NOTE—From time to time, *The Cross Section* spotlights new innovations that can help persons conserve water. Publication of such material in the newsletter is for informational purposes only and should not be construed as an endorsement of the product/services by High Plains Underground Water Conservation District No. 1—**CEM.**

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Imagine a subsurface drip irrigation system that supplies water and nutrients on-demand in response to chemicals released by plant roots in the soil. Science fiction? No, it's now science fact!

Growstream™ by Responsive Drip Irrigation (RDI) was among many water efficiency products showcased at the 2019 WaterSmart Innovations Conference. The system was first released in December 2018.

"Our product is a unique subsurface irrigation system that reduces water usage by more than 30-50 percent as compared to traditional subsurface drip irrigation systems. It is a plant-responsive irrigation technology based on organic chemistry that works with nature to irrigate plants," said Jan Gould, RDI founder.

"When plants need water and nutrients, they emit root exudates that allows them to uptake what they need from the surrounding soil," said Gould. "The Growstream™ system responds to these exudates with fluctuating releases of water and nutrients from the millions of 'smart micropores' in the tubing. When the plant's needs are satisfied, it stops producing exudates. This, in turn, signals Growstream™ to stop releasing water," she said.

The system has been tested in varying environments and conditions. One test involved growing white cabbage in a "soil" of sand and crushed shells.

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"Tests showed that the system could efficiently deliver water and nutrients to the plant roots," said Gould.

Another test involved planting groups of ornamental plants with variable water needs in a row that was irrigated by a single Growstream™ tube.

"We had a mixture of xeric and water-thirsty plants for this test. We found that Growstream™ can support different crops/plants with variable water needs on a single line. The system supplied irrigation at variable release rates to meet each plant's respective water needs," she said.

Gould pointed out that the patented system is easier to install and operate as compared to typical drip irrigation systems.

"There are no emitters to clog or malfunction since the tubing has millions of microscopic surface openings that release water. Growstream™ operates at a pressure of 2-4 pounds per square inch (psi) and can deliver water in row lengths exceeding 1,200 feet. There is no need for electronic components. The system basically consists of a water pressure regulator, fittings, and the tube. No solenoids, valves, controllers, timers, or other electronic devices are needed," said Gould.

The system is typically less expensive than conventional subsurface drip irrigation systems with zones, valves, and smart controllers. However, Gould says the cost is slightly higher compared to older systems using pop-up sprayers and surface drip. The system will last more than eight years.

While Growstream™ is primarily being installed for use in lawns and landscapes, Gould says it does have an application for home gardens, small farms, and commercial growing operations.

"In 2017, we conducted an organic romaine lettuce trial with a commercial grower in Monterey County, California. The plant-responsive system resulted in a larger, higher-grade crop using 29

percent less water and 50 percent less organic fertilizer. During Summer 2019, Growstream™ achieved 25 percent higher yield while using 30 percent less water for tomatoes grown in a greenhouse in Africa. This is in comparison to a hydroponic delivery system," she said.

"We see great potential for its use—especially in orchards and vineyards in California and the western United States," said Gould.

Since the system requires very little pressure to operate, water stored in a raised tank or rainwater harvesting barrel can be used to irrigate an entire lawn, including trees and landscapes. It can also be used to irrigate crops in remote farm locations.

Locations in the United States include California, Colorado, Florida, and Kansas. Future projects are planned in New Mexico, Texas, and Utah.

Visit www.responsivedrip.com, email info@responsivedrip.com, or call (941) 792-9788 for more information.

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