

UK Research Finds Pulse Irrigation Potentially Useful For Farmers

LEXINGTON, KY.

In today's economic climate, Kentucky farmers are trying to save money across the board – from planting to harvest and everything in between. A few big money items can be irrigation and fertilizer. If farmers can reduce their need for both, everyone wins. University of Kentucky College of Agriculture researchers in horticulture and biosystems and agricultural engineering are studying a type of irrigation that may help.

Producers use many different methods to apply drip irrigation.

"Most often the irrigation system is simply operated for a set period of time, usually between one and three hours per zone," said Richard Warner, water resources and sediment control specialist with UK's Biosystems and Agricultural Engineering Department. "Other producers utilize either one or two tensiometers which measure the soil moisture to a specified level."

UK researchers currently are testing a more non-traditional way of irrigating crops called pulse irrigation. This system provides small intervals of water to meet the moisture needs of a plant. For example, Warner said he can program a pulse irrigation system to operate for 10 to 15 minutes every hour for six to 12 hours per day. This provides just enough water to the upper root zone to meet the plant's needs.

"We conducted experiments on a standard drip irrigation system to determine the downward movement of water," Warner explained. "We excavated beneath a plot, entering through the side of the plot, and measured the quantity of water that had moved through an 18-inch soil depth."

Warner said within 30 minutes, he was measuring flow through the soil, which means the irrigation water was moving through the openings in the soil created by decayed roots and worms.

"There was a significant amount of water and applied fertilizers that the plant did not use," he said. "They were basically wasted. With pulse irrigation, we may be able to eliminate a lot of those wasted inputs."

Besides a drip irrigation system, a producer wanting to use pulse irrigation will need an irrigation controller, solenoid valves for each zone and direct burial underground wire that connects the electrical valves to the controller.

Warner expects many benefits of pulse irrigation, not the least of which is less water and fertilizer migrating into the groundwater.

"The amount of water applied could be reduced by as much as 20 percent, and that will provide substantial savings, especially for those operators who purchase city water," he said. "There may be a corresponding reduction in fertilizer since, with better usage of water, there should be a more efficient usage of nutrients."

Research specialists have begun applying this joint departmental research through demonstration projects involving tomatoes, blackberries and blueberries.

"As we make progress, we will host a field day to demonstrate the pulse irrigation system – the components, installation and operation," Warner said. "The horticulture department is conducting yield studies to contrast standard drip irrigation practices with pulse irrigation, and we'll provide the results through extension publications and other media." Δ