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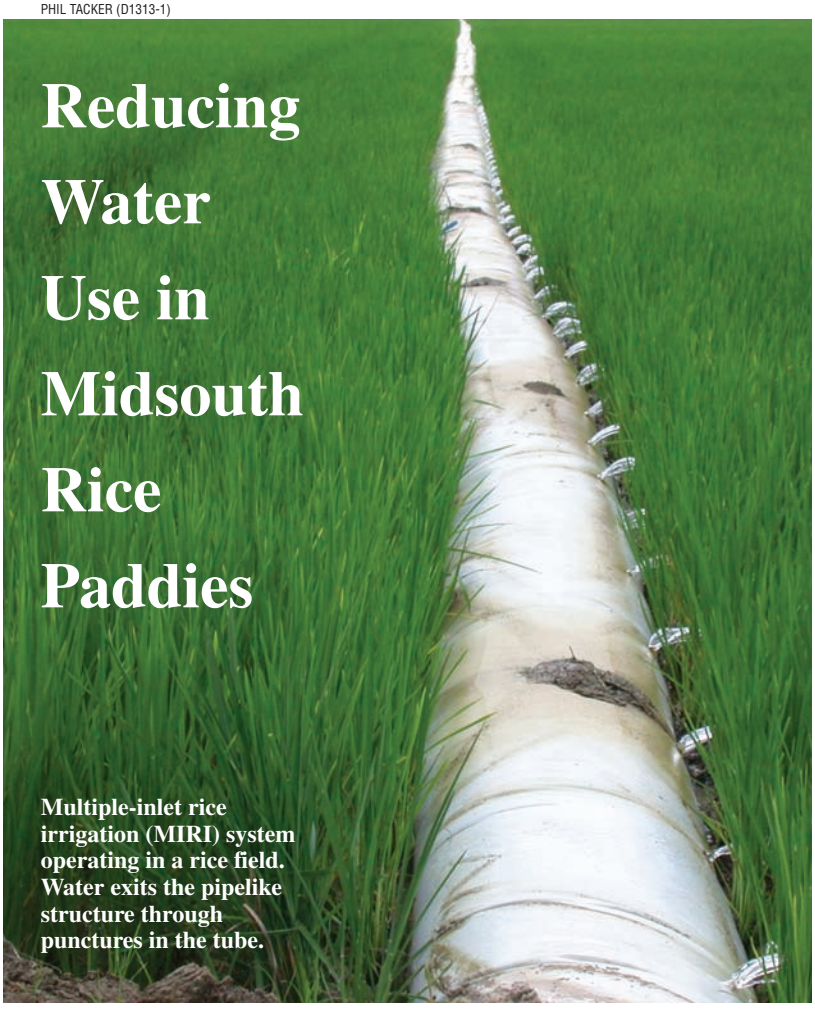

Reducing Water Use in Midsouth Rice Paddies

Multiple-inlet rice irrigation (MIRI) system operating in a rice field. Water exits the pipelike structure through punctures in the tube.

Compared to other crops in the Midsouth, rice requires a lot of water—most of which is pumped from shallow aquifers that are dwindling. Now Agricultural Research Service (ARS) and cooperating scientists are studying a system that, in rice field tests, cuts water use by 24 percent.

The system, called "multiple-inlet rice irrigation," or MIRI, involves laying disposable, thin-walled, polyethylene irrigation tubing to connect rice paddies as they are flooded with water. Currently, most rice fields are flooded by discharging water directly into the highest paddy and allowing it to overflow into lower paddies.

Earl Vories, an agricultural engineer at the ARS Cropping Systems and Water Quality Research Unit's satellite location in Portageville, Missouri, has been working with colleagues in the unit and with extension engineer Phil Tacker and others at the University of Arkansas Cooperative Extension Service to study water requirements for rice on a commercial production scale.

Their on-farm water-use studies, from the 1999 through the 2002 growing seasons, consisted of 14 paired fields located close together, with the same cultivar, soil type, planting date, and management practices.

The researchers found that the MIRI method required an average of 24 percent less irrigation water than conventional paddy flooding. Reducing irrigation-water use for rice is important for the farmer's other crops too, because those fields often share a water supply with the rice. The amount of water available to irrigate the other crops usually depends on how much water is used first to adequately irrigate the rice. A 24-percent water savings in rice paddies should correspond to higher yields for these other crops. And less pumping for rice should result in less overall demand on declining aquifers.

Vories and colleagues also investigated the economic impact of MIRI for various water supplies commonly used for rice production in the region. Subsequent studies have addressed the environmental impact of the system by looking at the quality of runoff from the fields. The researchers found no decline in water quality using the MIRI system.

"Our preliminary results are good news for rice farmers trying to save water and energy while maintaining yields and protecting the environment," says Vories.—By **Alfredo Flores,** ARS.

This research is part of Water Availability and Watershed Management, an ARS national program (#211) described on the World Wide Web at www.nps.ars.usda.gov.

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In studies of water use, runoff, and water quality, ARS agricultural engineer Earl Vories (right) and University of Arkansas technician Shawn Lancaster collect data from a MIRI system.