Publications

TR-134

Sprinkler Irrigation as an Energy and Water Saving Approach to Rice Production and Management of Riceland Pests

Garry N. McCauley, Lloyd R. Hossner, Douglas M. Nesmith

- Full Text

Rice is currently produced on approximately 400,000 acres in the Texas Coastal Prairie. This rice consumes 1.8 million acre-feet of water a year or 13 percent of Texas' renewable water resources. The Texas Coastal Prairie is a delicate ecosystem providing winter homes for many birds and water fowl and breeding grounds for marine life in the marshes of the Gulf Coast. The Texas Coastal Prairie has been experiencing rapid population and industrial growth. These areas of growth are placing increased demands on the water of the area. Continued rice production will require water conservation practices.

This research evaluated the potential water conservation for sprinkler irrigation in rice production. The research evaluated the potential production of prominent commercial cultivars under various levels of moisture stress, the adaptability of 10 major soil series to the utilization of sprinkler irrigation, and the use of adjuvants to increase the infiltration on one low infiltration soil. Some cultivars did exhibit resistance defined as sustained production under reduced water supply. However, these cultivars were not the most productive. The cultivars which are the highest yielding under flood irrigation were also the highest yielding under sprinkler irrigation. The medium grains appear to be the most adaptive. However, some long grains did show potential.

Adjuvants tested did increase the water infiltration into the Nada soil. Yield levels within 15 percent of those from flood irrigations were achieved. However, the high levels of adjuvants used were phytotoxic to the rice. Lower rates or other adjuvants might be better adapted to use on rice.

Soil water infiltration as determined by rainfall simulator did reveal differences in infiltration rates of the soils tested. The clay soils had the highest infiltration rate at saturation. The fine sandy loam soils developed a crust after initial

applications which reduced later infiltration rates significantly. All soils could be irrigated but some of the soils such as the Nada fine sandy loam had a saturated infiltration of less than 0.65 cm per hour which could be prohibitive to a commercial rice production system.

Texas Water Resources Institute

1500 Research Parkway A110
2260 TAMU
College Station, TX 77843-2260

Phone: 979.845.1851
Fax: 979.845.0662
Email: twri@tamu.edu

TWRI and the Texas A&M Institute of Renewable Natural Resources are working together to foster and communicate research and educational outreach programs focused on water and natural resources science and management issues in Texas and beyond.

© 2013 All rights reserved. Problem with this page? Contact: twri-webmaster@tamu.edu