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Cotton Crop Rotations: *Can it conserve water?*

by Shelby Axtell

As the Ogallala Aquifer continues to decline, agricultural producers are examining options to sustain their farm and water supply for future years. Researchers at the Texas Agricultural Experiment Station are continually studying alternative irrigation and cropping practices for producers to implement into their operations.

Jim Bordovsky, research scientist and agricultural engineer, and Dr. Dana Porter, Texas Cooperative Extension agricultural engineer and irrigation specialist, are currently working on a cotton sorghum rotation project that will help determine what and if a crop rotation allows for a more efficient use of irrigation water, while still producing profitable yields at Halfway, Texas.

The purpose of the project is to find a means to obtain higher water use efficiency with cotton by using a crop rotation. Bordovsky said this project uses crop rotations, reduced tillage, and Low Energy Precision Application (LEPA) irrigation strategies, with varying water amounts. The treatments in rotation include continuous cotton, cotton followed by cotton and then sorghum, cotton followed by sorghum and then again by cotton, and finally sorghum, followed by two years of

cotton. Annual cotton yields and water use efficiencies from the rotation treatments are compared with those of the continuous cotton system.



Jim Bordovsky, Texas Agricultural Experiment Station research scientist and agricultural engineer, examines cotton bolls. Bordovsky and other scientists have been working on a cotton/sorghum crop rotation project to help determine what crop rotations are the most profitable on limited irrigation water.

Texas Cooperative Extension photo by Tim W. McAlavy.

So far, results have shown that a limited amount of irrigation water, when compared with a greater amount of irrigation water use, has produced greater cotton yields when used in a rotation with sorghum, Bordovsky said. However, the continuous cotton system has been more profitable due

to sorghum having a much lower commodity price compared with cotton.

“One of the advantages of crop rotations is the flexibility in irrigation needs as sorghum and cotton require varying amounts of water at different times,” Bordovsky said.

With only a limited amount of water to use, a crop rotation would allow producers to more effectively use their limited irrigation capacity. Additionally, crop rotations offer opportunities to utilize less fertilizers, differing weed and pest control programs, diversify risks, and incorporate greater crop residues from sorghum to improve soil organic matter, and to enhance wind and water erosion protection.

Bordovsky notes that further research will be conducted on this study. Other crops may be added into the rotation, water application times may vary, but Bordovsky said the amount of water usage will not differ from the original project. The purpose of the Ogallala Initiative projects is to find practices that more efficiently use irrigation water to in turn conserve the aquifer.

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