A RETROSPECTIVE REVIEW OF COTTON IRRIGATION TERMINATON IN THE MIDSOUTH

Michele L. Reba
USDA-Agricultural Research Service-National Sedimentation Laboratory
Jonesboro, AR
Tina Gray Teague
Arkansas State University, University of Arkansas, Division of Agriculture
Jonesboro, AR
Earl D. Vories
USDA-Agricultural Research Service-Fischer Delta Research Center
Portageville, MO

Abstract

Irrigation plays an important role in producing consistent and reliable cotton yields in the Midsouth. Of the approximately 600,000 acres of cotton planted in 2007 in Arkansas, over 90% was irrigated. Most cotton acreage is irrigated from the alluvial aquifer, which is being used at an unsustainable rate resulting in cones of depression and increased pumping costs. A retrospective review of irrigation practices from 2005-2012 from a cotton farm in Mississippi County, Arkansas is presented. Irrigation logs, precipitation, plant mapping and yield data were used from 72 fields on over 7,000 acres during the 8-year period. Irrigation termination dates were evaluated and compared to existing guidelines of 350 heat units (DD60) accumulated after nodes above white flower five (NAWF5).Irrigation water applied and yield increases associated with irrigation were calculated for both pivot and furrow irrigated cotton. Irrigation termination guidelines were followed overall, and final irrigations were always within 1-2 weeks of the guidelines. Water applied plus precipitation averaged 29-38 inches for furrow irrigated fields for the 8-year study period (excluding 2005 and 2007 due to lack of data), and 15-32 inches for pivot irrigated fields during the 8-year period. An average yield increase of 18 and 33 pounds of lint per inch of irrigation water applied were calculated during 2011 and 2012, respectively. Water applied plus precipitation values from this study were consistent with plant needs yet there is evidence of irrigation triggered by a schedule and not based on growing conditions. Further analysis of irrigation timing is merited.