

**IRRIGATION INITIATION AND TERMINATION EFFECTS
ON COTTON YIELD AND FIBER QUALITY****Tom Barber****Jarett Chapman****University of Arkansas Division of Agriculture****Little Rock, AR****Paul Francis****University of Arkansas Division of Agriculture****Monticello, AR****Abstract**

A four year study was conducted in Arkansas to evaluate effects of irrigation initiation and termination timings on cotton lint yield and fiber quality. The objective of this study was to determine whether or not irrigation initiation timings could affect optimum termination timings. The study was designed as a split-plot with three irrigation initiation timings as main plots and irrigation termination timings as sub-plot factors. Irrigation treatments were initiated at two weeks prior to bloom, one week prior to bloom or the first week of bloom. Irrigation termination treatments were based on 300, 450 or 600 heat units accumulated after cutout (node above white flower = 5). Two soil types (silt loam and clay loam) were evaluated on C.B. Steven's farm in south Arkansas. Both fields were furrow irrigated and yield data was collected through a yield monitor system. Once irrigation treatments were initiated, subsequent irrigations were timed based on the Arkansas Irrigation Scheduler two inch moisture deficit timing. No significant differences were found with cotton growth, lint yield or lint percent with any initiation or termination treatments on the clay loam soil type. Slight differences were observed in fiber quality where micronaire was significantly reduced from 5.03 to 4.5 when irrigation treatments were initiated prior to bloom. Current results suggest that two inch water deficit irrigation schedule may be too high for clay soils and may explain why no differences were observed on the clay soil type. Results from the silt loam soil indicate a significant difference in cotton growth and development, lint yield as well as fiber quality when initiating irrigation prior to bloom. Cotton plants were on average 10 inches taller with early irrigation treatments than when delaying irrigation until bloom. Early initiation also provided better plant structure with an average 8.7 nodes above white flower at bloom versus 6.7 nodes above white flower where irrigation was delayed until bloom. Cotton lint yields were 150 lbs lint per acre higher with early irrigation treatments either one or two weeks prior to bloom than the delayed irrigation treatments. Similar to the clay soil, early irrigation treatments also significantly reduced cotton micronaire values. Interactions did exist in regards to cotton lint yields and irrigation termination. If irrigation was initiated one or two weeks prior to bloom, it could be terminated early (350 heat units). However, if irrigation was delayed until bloom highest lint yields were achieved with maintaining irrigation to 450 heat units after cutout. This data suggests that the critical period for irrigation initiation is the week prior to bloom. Irrigation termination depends greatly on initiation timings but over the course of the study was optimized at 450 heat units after cutout.