EFFECTS OF CULTIVAR, IRRIGATION MANAGEMENT, AND PGR STRATEGY ON COTTON YIELD AND MATURITY

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Abstract

Drought is known to negatively impact growth and yield, whereas excessive irrigation can limit yield by producing rank growth, low fruit retention, and delayed maturity in some instances. PGR application limits internode elongation, producing shorter plants, higher fruit retention at lower nodes, and earlier maturity. Thus, it has been questioned whether the negative impacts of excess irrigation could be mitigated through more aggressive PGR management practices. The objective of the current study was to address the effects of cultivar, irrigation management, and PGR strategy on cotton growth, maturity, and yield. To this end, the current study assessed three cultivars (DP 1646, DG 3615, DG 3799), three different irrigation treatments (rainfed, recommended irrigation strategy (100% ET), and over-irrigated (125% ET)), and three different PGR treatments (aggressive, moderate, and untreated). Plant height was measured at the end of the season. Maturity was assessed by quantifying NAWF over time and using regression to calculate the number of days to cutout for each plot. Seedcotton yield was also determined at the end of the season for mechanically harvested plots. There was a significant three-way interaction between irrigation, cultivar, and PGR management for plant height, indicating that plant height response to PGR was dependent on the cultivar planted and the irrigation strategy employed. For maturity, however, there was only a two-way interaction between irrigation and PGR treatment. Specifically, dryland cotton plants reached cutout at the same, irrespective of PGR treatment, and they cutout earlier than any of the irrigated treatments. Within irrigated treatments, plots receiving no PGR application reached cutout nearly two weeks later than PGR-treated plots. For seedcotton yield, there were significant effects of cultivar, irrigation, and PGR treatment, but there was no interaction between any of these main effects. Within the effects of cultivar, irrigation, and PGR treatment, respectively, the highest yields were observed for DG 3615 and 3799, both irrigated treatments, and a moderate PGR management strategy.