IRRIGATION AND VARIETAL IMPACTS ON COTTON (*GOSSYPIUM HIRSUTUM*) FRUIT PARTITIONING

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Abstract

Multiple irrigation thresholds and cotton varieties were evaluated to determine their effect on cotton fruit partitioning. Three irrigation thresholds (Non-irrigated, 90 kPa, and 130 kPa) and three Stoneville® varieties (ST 4949 GLT, ST 5471 GLTP, and ST 6182 GLT) were on a Leeper silty clay loam. This study was conducted near Starkville, MS in 2018 and was set up as a factorial arrangement of treatments within a randomized complete block design with four replications. Experimental units were planted on 30 May 2018 at 111,000 seed ha^{-1} and consisted of six rows that were 12.2 m long on 97 cm raised beds. Each experimental unit received 134 kg N ha^{-1} using a coulter-knife injection applicator, 56 kg N ha^{-1} at emergence and 78 kg N ha^{-1} at pinhead square. Two irrigations of 0.03 ha m^{-1} were applied to 90 kPa plots, while 130 kPa plots received one. Cotton was box mapped according to Jenkins et al., (1990). Horizontal weight was sorted by monopodial branch or fruiting position on sympodial branches and vertical zones consisted of zone one: nodes five through eight, zone two: nodes nine through twelve and zone three: nodes thirteen and above. Seed cotton weight and the number of bolls contributing the weight were evaluated. All data were analyzed with PROC Mixed in SAS v. 9.4 with means separated using Fisher s Protected LSD at ± = 0.05. Data indicate that fruit partitioning, i.e. horizontal and vertical distribution, was not affected by irrigation. Experimental units received plentiful precipitation reducing typical irrigation requirements and diminishing any differences among irrigation treatments. ST 6182 GLT partitioned the least percent of seed cotton at sympodial position one (70%) but generated the greatest percent at position two (21%). ST 4949 GLT partitioned the greatest percent of seed cotton to zone one (34%), while ST 5471 GLTP partitioned the greatest at zones two and three, 53% and 23%, respectively. Overall, ST 5471 GTLP produced the greatest seed cotton yield. Sympodial positions one and two produced 90% of total seed cotton yield while position three and monopodial branches range from 1-2% and 4-8%, respectively.