DAMAGE SIMULATION IN EARLY- AND LATE-MATURING COTTON VARIETIES IN THE MID-SOUTH

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Abstract

With over $5 billion in crop and property damages occurring in the United States from hail and wildlife each year, it is crucial for farmers and insurance companies to understand cotton response to crop damage. Cotton, a major commodity in Mississippi, has an indeterminate growth habit allowing for it compensate for damage better than other crops; however, understanding it's response may also be more complicated. In order to assist with better management decisions and recommendations, the objective of this research was to evaluate the impact of damage intensity and timing on cotton yield in early- and late-maturing cotton varieties.

Experiments were conducted in 2015 and 2016 at the R.R. Foil Plant Science Research Center in Starkville, MS (irrigated) and the Black Belt Branch Experiment Station in Brooksville, MS (non-irrigated). PHY 222 WRF, a passive, early-maturing variety and PHY 499 WRF, an aggressive, late-maturing variety were planted on May 8 and June 1 in Starkville and May 21 and June 2 in Brooksville in 2015 and 2016, respectively. Plots were 2-rows 1.9 m wide x 12.2 m long which were replicated four times in a randomized complete block design. Damage was simulated by counting the number of nodes on each plant per plot and then removing nodes mechanically with scissors. Damage was simulated at four different growth stages, 4-leaf (4 nodes), pinhead square (8-10 nodes), 1st Bloom (12-14 nodes), and 1st Bloom + 4 weeks (18-22 nodes). At the 4-leaf growth stage, 2 or 4 nodes were removed from the plant, where 4 nodes were removed only the cotyledons were left on the plant. At all other growth stages 2, 4, 6, or 8 nodes were removed from the plants. Untreated plots where no damage was simulated were also incorporated for comparison purposes. No chemical plant growth regulators were applied to any cotton in this experiment. Seedcotton yield was collected on Oct. 12 and Oct. 24 in Starkville and October 19 and Oct. 27 in Brooksville in 2015 and 2016, respectively. Data were pooled across year (2015 and 2016) and were subjected to analysis of variance using the PROC Glimmix procedure in SAS 9.4 and multiple pairwise T-tests were used to separate means at $p = 0.05$.

Results of this experiment indicate that removal of 8 nodes at pinhead square (8-10 nodes) and at 1st Bloom (12-14 nodes) resulted in significantly lower yields compared to all other removal timings in PHY 499 WRF at both locations. Node removal at 1st Bloom + 4 weeks did not have a significant effect on yield in either PHY 222 WRF or PHY 499 WRF in Starkville or PHY 222 WRF in Brooksville. Early maturing cotton (PHY 222 WRF) produced similar yields in Brooksville (non-irrigated) regardless of node removal or growth stage. Overall, PHY 222 WRF was shorter in height than PHY 499 WRF at the end of the season. Cotton maturity at the end of the season was delayed when 8 nodes were removed at pinhead square in both PHY 222 WRF and PHY 499 WRF.