

CHANGES IN GIN STAND POWER CONSUMPTION FOR DIFFERENT COTTON VARIETIES

J. Clif Boykin

USDA-ARS

Cotton Ginning Research Unit

Stoneville, MS

Abstract

The gin stand power consumption was monitored while ginning the Stoneville Regional Cotton Variety Test. The electrical power required to separate the fiber from the cottonseed by the gin stand was evaluated as a potential indicator of the attachment force between cotton fibers and cottonseed. The test was conducted on a 20-saw gin stand in the microgin at Stoneville, MS, with lots of cotton weighing about 30 pounds and requiring about 2 minutes to gin. Power consumption was measured with a standard W-hr meter and time was measured with a stopwatch. There were 38 varieties included in the early maturity trial and 27 varieties included in the medium maturity trial in three replications. For the early maturity variety trial, gin stand power consumption averaged 4,480 Wh/bale and ranged from 3,878 to 5,252 Wh/bale. For the medium maturity trial, power consumption averaged 4,720Wh/bale and ranged from 4,035 to 5,497 Wh/bale. Power consumption varied significantly with the sample weight, suggesting an insufficient sample size. The lint moisture content of the early maturity trial was consistent (4.16%, 0.20 standard deviation) and did not appear to influence the gin stand power consumption. For the medium maturity trial, lint moisture was less consistent (5.07%, 0.34 standard deviation), and increases in lint moisture appeared to correspond to increases in power consumption. For both tests, power consumption decreased with ginning rate, but this does not imply that power consumption can be reduced by ginning faster. The remaining differences in varieties for gin stand power consumption may be related to changes in the average fiber-to-seed attachment force of different varieties, but further studies are required to substantiate this conclusion.