WITHIN-PLANT VARIATION IN THE NUMBER OF COTTON (*Gossypium hirsutum*) FIBERS PER SEED SURFACE AREA

Addissu Ayele
Eric Hequet
Brendan Kelly
Texas Tech University; Texas A&M AgriLife
Lubbock, TX

Abstract

To investigate the number of fibers per seed surface area (fiber density) within plant, twelve modern commercial upland cotton varieties representing a wide range of genetic backgrounds were evaluated in open field condition. The cultivars were grown in a randomized complete block design with three field replications in Lubbock, Texas, during the 2012, 2013 and 2014 growing seasons. Bolls were box picked at maturity in order to examine the within-plant variability. Samples collected from the first fruiting positions of each variety were ginned on a roller gin. The fuzzy seeds obtained after roller ginning were acid-delinted by immersing the seeds in concentrated sulfuric acid and then neutralized with lime. The delinted seeds were then dried. The acid-delinted seeds were scanned using the WinSeedle Pro software and the Seed Surface area (SSA) was estimated based upon the elliptical object method. The number of fibers per seed surface area was obtained by dividing the number of fibers per seed, estimated from the AFIS (Advanced Fiber Information System) and the lint weight, by the estimated SSA. Varieties with relatively stable fiber properties along the plant tend to have less variable estimated number of fibers per seed surface area suggesting that the calculation of the number of fibers per seed surface area unit may be biased (low maturity fibers tend to break during mechanical processing and artificially increase the estimated number of fibers per seed surface area).