

QUALITY SCORE (QS): BREEDER SELECTION TOOL WITH ANOTHER YEAR OF DATA

Don C. Jones
Cotton Incorporated
Cary, NC

Abstract

As previously reported on at the 2007 and 2008 Beltwide Conferences, the quality score index (QS), was developed using four fiber properties provided from high volume instrument (HVI) testing. The reason for development of QS is two fold: 1) approximately 70% of US grown cotton is being exported to international buyers, and 2) breeders need one easy to calculate fiber quality number, rather than four or more, to make discard decisions in their programs. Most international buyers demand longer staple length, less variation in micronaire, increased length uniformity, and acceptable strength. QS allows cotton breeders to easily and quickly select strains in a breeding program using the fiber quality properties discussed above. This experiment was conducted to test whether higher QS values resulted in higher quality yarn, and likewise, if lower QS values gave lower quality yarns.

QS is based on HVI data generated from entries grown in the same experiment. HVI fiber data is first scaled using two standard deviations of the entire US grown crop to eliminate units of measurement, and then QS in the experiment is calculated using the following weights: .5 (upper half mean length) + .25 (micronaire) + .20 (uniformity index) + .05 (strength). The score is reported on a 0 to 100 scale with higher values considered most desirable and lower numbers considered inferior. Micronaire values between 3.8 and 4.6 provide maximum contribution to QS. Micronaire values outside of this range have decreasing contribution to QS. Likewise, international buyer demands prompted us to fashion QS such that strength values below 28 contribute less to QS while values above 28 provide increasingly more contribution to QS.

During the 2007 growing season a four replication, four entry experiment was grown in nine locations ranging from Maricopa, Arizona in the west to Florence, South Carolina in the east. Seed cotton from all replications was combined so that enough fiber was available to generate a lint sample sufficient for spinning. All samples were ginned in a similar manner on the University of Georgia MicroGin in Tifton, Georgia. Lint samples were then analyzed using HVI and AFIS equipment at Cotton Incorporated in Cary, North Carolina. Yarn samples (Ne 22/1) were produced and analyzed at Cotton Incorporated also. Data was analyzed using PROC GLM in SAS. AFIS traits are not reported in this abstract.

Three yarn traits commonly measured in spinning performance are evenness, entanglements, and strength. Evenness is measured by thin and thick places. This experiment indicated thins were predicted with QS, and this agreed with previously grown trial results. Yarn thick places were not predicted well, and this too agreed with previous data. Entanglements, as determined by number of neps, were not able to be predicted using QS, and this lack of prediction also agreed with previous years observations. The one yarn parameter where conclusions in this experiment did not agree with prior year observations was yarn strength as measured both by skein test and single end breaks. In prior year experiments testing yarn strength was predicted using QS, but the results herein indicated QS to be far less useful as a predictor for yarn strength.