Q – SCORE: IMPROVEMENT IN PREDICTIVE VALUE

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Abstract

As reported at four previous Beltwide Conferences, the quality score index (QS), was developed using four fiber properties provided from high volume instrument (HVI) testing. The properties were UHM, mic, UI, and strength. The reason for development of QS is two-fold: 1) nearly 80% of US grown cotton is being exported to international buyers, and 2) breeders could use one easy to calculate fiber quality number, rather than four or more, to help make discard decisions in their programs. The emphasis on improved fiber quality is driven by international buyers who demand longer staple length, less variation in micronaire, increased length uniformity, and acceptable strength. The objective of this project was to: 1) model spinning performance using two versions of QS and 2) compare predictive ability on spinning performance. Analysis of data from the Regional High Quality Trial and Regional High Quality Test indicates that adjusting coefficients in QS increase its predictive value.

Data used in developing the QS ver1 model came from the Regional Testing Network Trial RBTN and included testing years 2006, 2007, and 2008. Three or four varieties were grown at 8-10 locations per year. 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 StepWise Model Building from SAS. To test the robustness of the index, another larger data set, the Regional High Quality Trial [RHQT] conducted by ARS at Stoneville, Mississippi, was analyzed in similar fashion as the previous data set. The RHQT data set consist of 15-22 varieties per year grown in 1999-2008. Local ginning was completed, and fiber and yarn was produced by Star Labs in Knoxville, Tennessee.

Yarn traits commonly measured in spinning performance are strength, evenness, and entanglements. Yarn strength is often times reported in skein strength and reported as adjusted break factor. A second yarn strength parameter is single yarn breaks (reported as RKM). Evenness is measured by thin and thick places and entanglements reported in neps produced. QS ver1 used the following coefficients: UMH .50, mic .25, UI .15, and strength .10. Yarn quality was not predicted well with QS ver1. However, QS ver2 increased R^2 values over 4 fold for adjusted break factor and RKM. The new coefficients were UHM .10, mic .10, UI, .30, and strength .50. The ability to predict yarn properties thins, thicks, and neps did not improve with QS ver2 to any degree.