SUMMARY

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Almost all fiber and yarn traits were negatively influenced by increasing the short fiber content. This is except for: (i) fiber yellowness degree; (ii) fiber stiffness; (iii) yarn unevenness (iv) yarn neps; and (v) yarn hairiness where there were positive SFC's effect. This influence was both cultivar- and trait-dependent. Estimated parameters were generally nonzero ($p<0.05$) for most studied fiber and yarn traits. The R^2 values generally ranged from 60%- > 90% except for few cases where values were down to less than 20% across fiber and yarn traits.

No consistent response pattern which might signify this relationship even within cultivars that belong to either staple length category. First, within the same staple-length category, cultivars showed near values of the mean response variable at low SFC, but this closeness started to widen up, i.e. divergence of data as SFC gradually increases; yet, in other cases, the opposite occurred, i.e. convergence of data. Second, within- or between-staple-length categories, some fitted lines had nearly equal intercepts and slopes. This implies that if these estimated parameters were statistically equal, therefore a single fitted line for these cultivars may be developed. Third, some cultivar pairs showed a reverse response at certain SFC value, this indicated a cultivar X SFC interaction occurred; and this ought to be accounted for. Grade variations in SFC were quite effective in exhibiting differentials in the response for either fiber or yarn traits,

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Regression models always need to be tested for lack of fit. This requires either a previous estimate of variance (σ^2) or an estimate of lack of fit variance. The latter indeed requires planning, at the initiation of the experiment, for genuine repeat runs. Depending on historical data deems necessarily having all information concerning all environmental and processing factors these cotton fibers had been subjected to since they greatly influence initiation of SFC. To control the high CV of SFC and to improve its reproducibility, it is recommended either to modify sampling methods or to use other statistical parameters that well characterize SFC, i.e. highly correlated, and at the same time of less variation such as lower quartile length and lower half mean length. Including in the model, in addition to SW SFC, other fiber parameters that are based on other instruments may have a wider perspective to characterize yarn quality traits.