The Effect of Bale Ageing on Cotton Fiber Chemistry, Processing Performance, and Yarn Quality

Authors: Gary R. Gamble
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The effects of ageing as a result of extended warehouse storage of baled cotton on fiber processing characteristics have not been extensively investigated. This study attempts to address this issue by characterizing some of the chemical and physical factors of the cotton fiber both before and after storage for 2 years, and by comparing any changes that occur with changes observed in yarn processing and resultant yarn quality. Results indicate that subsequent to storage, sugar content and moisture content both experience significant changes. Conductivity, pH, and wax content did not exhibit any statistically significant changes. Of the physical factors measured by HVI (micronaire, length, strength, uniformity, Rd, and +b), only +b exhibited a significant change. The changes in chemical components did not appear to have an impact on processing performance as inferred from the fact that fiber friction and yarn uniformity were not affected. Quality measurements on the resultant yarn, however, indicate a significant reduction in yarn strength. The primary conclusions from these results are that cotton aged for 2 years causes a detrimental effect on cotton quality because of the change in color grade, while a negative impact on yarn quality is seen as a result of decreased yarn strength. Possible causes for this observed decrease in yarn strength are discussed in terms of the measured chemical variables.