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## The Impact of Carding Micro-climate on Cotton Moisture Content and Fiber and Yarn Quality

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Temperature and relative humidity are important considerations for carding cotton in textile manufacturing. It has been suggested that high relative humidity decreases the stiffness of fibers and increases the moisture content of the fibers. With the recent interest in moisture addition at the gin, it is important to determine if increased fiber moisture content in the cotton bale will also benefit the textile manufacturer. In this study, a standard carding atmosphere and a modified atmosphere of low temperature and high humidity were used as the treatments. Bales of the same cultivar and module were ginned sequentially in order to reduce the variability in the fiber properties. All cotton was processed on the same textile equipment. The only variable was the atmospheric conditions surrounding the card. The results of this work indicate that increasing the degree of saturation of the air surrounding the card by cooling the air and increasing the relative humidity minimizes the loss in moisture content of the cotton fiber through carding and reduces short fiber content in carded and finisher drawing sliver. Rotor yarn processing and quality were not affected by the treatment. Ring yarn processing efficiency, and ring and vortex yarn quality was improved in the cooler, moister environment surrounding the card.