

**AN INVESTIGATION OF THE EFFECT OF  
COTTON WAX CONTENT ON FIBER-TO-FIBER  
COHESION AND YARN STRENGTH**

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**Abstract**

It is well known that the wax content of cotton plays an important role in the processing efficiency of its conversion from fiber to fabric and in the subsequent ease of its wet processing (dyeing and finishing). It is also believed that wax content may play an important role in the strength and elongation of yarns spun from these cottons. In this study, 36 varieties of US upland cotton were chosen and the effect of cotton wax on fiber-to-fiber cohesion and yarn properties was investigated.

The wax content of cotton samples were determined by the Conrad method. The average wax content of the 36 cottons was 0.62%. Cotton samples before and after dewaxing were run through a Rotoring machine to form high quality slivers. The slivers were then fed through a Westpoint Cohesion Tester to measure their fiber-to-fiber cohesion. The cohesion increased by 191% on average after dewaxing. After cohesion testing, the slivers were tested for length on an AFIS (Advanced Fiber Information System). The average fiber length of dewaxed cotton decreased by about 15% and short fiber content increased by about 113%. The separation and parallelization of fibers by the Rotoring were similar to that of carding, while the drafting action on the cohesion tester resembled that of drawing. The effect of cotton wax on reducing fiber damage during processing was obvious. Yarns made from the 36 cottons were also dewaxed and their tensile properties tested on a Uster Tensorapid. The average strength of dewaxed yarns increased by 31%. The interrelations among the wax content, yarn tensile properties and various fiber properties were also analyzed statistically.