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<u>Abstract</u>

A study was done to determine how 1) the length distribution of a medium staple upland cultivar was affected by the possible range of ginning and lint cleaning treatments, 2) the length distribution of the fiber lost during increasing levels of lint cleaning changed and 3) changes in ginned fiber length distribution affected textile processing. An upland cultivar that was a reasonable representation of the midrange of U.S. upland cottons in terms of length and strength was used for the study. There was a significant shift towards shorter fibers in the length distribution with saw ginned fiber as would be expected when comparing roller ginning with saw ginning. What was not expected is that the percentage of fibers in the 2.21 to 2.54 cm (0.87 to 1.00 inch) length range stayed relatively constant while the percentage above this range decreased as the percentage below increased as the level of mechanical processing increased. Some long fiber is lost to lint cleaning at all stages but most of that fiber is not of significant textile value. Based on staple length alone, the fiber lost to lint cleaning is worth between four to six cents less per pound than the baled fiber. Over 33% of the fiber lost at any lint cleaning stage was equal to or less than 1.27 cm (0.50 inch) in length and would be considered waste in the textile process. Subsequent textile processing of the ginned lint showed that the carding operation removed approximately the same amount of total waste from cleanly harvested spindle picked upland cotton regardless of the amount of machining the fiber received during ginning and subsequent lint cleaning. The level of waste in the raw ginned fiber was probably not a significant factor for this test. However, the differing levels of fiber distribution did significantly affect yarn quality. But the change in fiber distribution did not affect dying properties as indicated by white specks in dyed cloth. A priority for future lint cleaning research should be to reduce fiber breakage while maintaining reasonable levels of trash removal during gin lint cleaning.