# EFFECTS OF LEAF AND BRACT PUBESCENCE ON FIBER QUALITY OF NORMAL AND OKRA LEAF COTTON

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## Abstract

Organic cotton production reached 10,644 planted hectares in 2018 across three states in the U.S. One challenge in this production system is maintaining seed stock purity. Providing cultivars with a pre-bloom visual marker (leaf shape) may be an alternative method for assessing production fields. Prior to implementation, effects due to leaf shape and plant pubescence on cotton fiber quality need to be evaluated. Cotton leaf hairiness is known to have many impacts on the plant and fiber characteristics including insect susceptibility, ginning efficacy, and increasing cotton leaf grades.

An experiment was conducted in Lubbock, TX at the AgriLife Research & Extension Center and in Halfway, TX at the Halfway Research and Extension Center in 2019. In 2020 the study was continued in Lubbock, TX at the AgriLife Research and Extension Center. The objectives of this study were to determine the effects of cotton leaf shape and plant pubescence on cotton fiber quality parameters. Plots were planted at 98,800 seeds, ha in a randomized complete block design with 2-row plots 8 m in length and four replications. Factor A was leaf shape and Factor B was Cotton cultivar. Four normal leaf cultivars and four Okra leaf cultivars containing a range of plant hairiness from smooth to hairy were evaluated. Normal cultivars utilized were CA 4006, Stoneville 474, All-Tex Atlas, and FiberMax 958. Okra leaf cultivars utilized were All-Tex 220 OL, TAM WK 11 OL, FiberMax 832 OL, OL Sel. FiberMax 958. At physiological cutout leaf pubescence ratings were collected following Bourland et al., (2003) methods as 1 (smooth) to 9 (hairy). At this time ten leaf samples from the 4$^{th}$ node down from on the terminal were collected in each plot (Bourland et al., 2003). Also, five boll samples were collected from first position sites on the lower half of the canopy (Bourland and Hornbeck, 2007). Leaf area was collected with the Li-Cor 3100 leaf area meter. Leaf and bract trichomes were counted using a dissecting microscope with an alternative light source. Leaf trichome counts were conducted on the abaxial side of the leaf utilizing a 0.33 cm$^2$ diameter hole, and bract trichomes were counted on both sides of the bract center tooth with the mean value reported. Lint yield and turnout were collected at harvest, a 10 g subsample was collected for HVI quality analysis, and a 10 g subsample analyzed for leaf and color grade. Analysis of Variance was conducted using PROC MIXED in SAS (v. 9.4). Means were separated using Fishers Protected LSD at alpha = 0.05.

in summary normal leaf type had greater leaf trichome densities compared to the okra leaf type across all locations evaluated. Cotton cultivars with high trichome densities did increase cotton leaf grades in Halfway 2019, although these did not result in loan value discounts. Cotton leaf type had no effect on fiber quality parameters in 2019. No differences were observed in cotton loan value due to leaf type or trichome density in 2019.

## References

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