

**IMPROVEMENT OF COTTON (*GOSSYPIMUM HIRSUTUM*) FIBER SPINNING QUALITY THROUGH
SELECTION AND INHERITANCE OF FIBER ELONGATION**

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Abstract

The development of cottons with higher fiber quality has been a major objective in breeding programs around the world. Breeders have focused their attention on improving fiber strength and length, and have generally not used fiber elongation in the selection process. Although literature has reported a negative correlation between fiber elongation and tenacity, this correlation is weak and it should not prevent breeders from simultaneously improving fiber tenacity and fiber elongation. Furthermore, the work of rupture property, important in the spinning process, could be best improved by improving both fiber tenacity and fiber elongation.

Fifteen populations were developed in 2007 by crossing good quality breeding lines with high elongation measurements to 'FM 958'; a High Plains standard variety with good fiber quality but reduced elongation. Samples in every generation were ginned on a laboratory saw gin, and the lint was tested on HVI (High Volume Instrument). The F₂ and F₃ generations showed a wide range of variation for elongation (6.9% - 12.8% for the F₂ and 4% - 9.20% for the F₃) allowing divergent selection for low and high fiber elongation. A correlation (r) of -0.32 between strength and elongation was observed in the F₂ individual plant selections. In the F₃, the correlation (r) between strength and elongation was -0.36, and in the F₄ the correlation (r) was -0.10. This correlation is weak and should not prevent breeding for lines with good strength and elongation. Furthermore high correlation between F₂ and F₃ (r=0.7183) and between F₃ and F₄ (r=0.8762) for fiber elongation demonstrates that divergent selection is suitable, and should allow for the development of comparable lines with low and high elongation to be tested in spinning process.