

**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 generation showed a wide range of variation for elongation (6.9% - 12.8%) 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. This correlation is weak and should not prevent breeding for lines with good strength and elongation. Furthermore, elongation was the highest correlation seen among fiber properties ( $r = 0.7183$ ). The high correlation between F2 and F3 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.