

# EFFECT OF SKIP ROW VS. 40 INCH SOLID PLANTING PATTERNS ON COTTON FIBER PROPERTIES

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## Abstract

Greater sunlight penetration into the canopy should lead to increased second and greater boll set on lower plant nodes. The objective of the present investigation was to determine the effects of a skip row vs. solid planting pattern on cotton fiber properties. The research was conducted at two locations, Alexandria and Lettsworth in Louisiana in 1995 and 1996. The experimental design was split-plot with skip and solid row planting patterns as main-plots and three varieties, DPL5415, H1220, and SG404 as subplots. Fiber properties were determined by HVI at the LSU Cotton Fiber Laboratory from grab samples. Planting arrangement was not significant at either location or across years. Fiber properties were significantly different between varieties across location and years. These results indicate planting arrangement had no effect on fiber properties; however, significant differences were found between varieties for fiber properties.

## Introduction

Cotton fiber properties varies considerably among years and locations depending on prevailing environmental conditions (Pettigrew, 1995). In addition, fiber properties can be differ from lower to upper balls due to the ability of the boll to compete for plant carbohydrates as a result of shading of the plant (Thibodeaux et al., 1993). A skip row planting arrangement should increase the amount of light penetration into the plant and have the effect of increasing carbohydrate supplies available for lower position bolls and might also increase plant canopy temperature. Changes in canopy temperature has been documented to influence fiber properties (Ray, L. L. and J. R. Gipson, 1969, Ramey, 1986, Gipson, 1986). The objective of the present study was to determine the effect of a skip row vs. solid planting pattern on cotton fiber properties.

## Materials and Methods

The field study was conducted in 1995 and 1996 at two trial locations: LSU Dean Lee Research Station, Alexandria, LA and RLM Farms, Lettsworth, LA. The locations were specifically chosen. The soil at Alexandria is a dark colored loam that presumably would absorb much of solar radiation striking it. At Lettsworth, the soil was lighter, both in

texture (due to increased sand content) and color. The field chosen was representative of several in the area that have a tradition of producing higher than state average micronaire cotton. The experimental design was split-plot. The two planting arrangements (skip row and solid row) were main-plots, the three varieties (Delta & Pine Land 5415, Paymaster H1220, SureGrow 404) were sub plots. While 40 inches apart row was used as a solid row treatment, for skip row planting pattern, two row 40 inches apart then a third row left empty was used. Fiber properties were determined by HVI at the LSU Cotton Fiber Laboratory from grab samples. The analysis of variance procedure was used to analyze the data with the SAS statistical package (v 6.06 SAS institute, Cary N.C.) using PROC GLM. Duncans multiple range procedure was used to separate means.

## Discussion

Skip row planting arrangement did not affect fiber properties as much as anticipated. Possible reasons may include that increase light penetration allowed 2nd and 3rd position bolls to be retained and/or higher boll positions (~ 15 or above) to be retained. Figs.1 -3 show that there were only minor differences in fiber properties between the two planting arrangements. This observation is further supported by analysis of variance results which found no significant difference between the main plot treatments (skip vs. solid) at either locations or across year. As for the effect of variety on fiber properties, significant differences between the three varieties was observed for lint%, micronaire, uniformity, fiber strength and elongation (Table 1). Location effects were significant, with all three varieties have a higher micronaire at Lettsworth (mean = 5.46) than at Alexandria (mean = 5.18), regardless of planting arrangement in 1995. While not statistically significant, Lettsworth still had a higher micronaire across years, varieties, and treatments. This lends support to the evidence that Lettsworth area has an environment favoring the production of higher micronaire cotton. These results also suggest that selection for fiber properties for either skip or solid row production could be done in one production scheme.

## Summary

Planting arrangement (skip row vs solid row) was not significant at either location or across years. Fiber properties were significantly different between varieties across locations and years. It can be concluded that, at least as far as fiber properties go, that planting arrangement had no effect on fiber properties in 1995 and in 1996; however, significant differences were found between varieties for fiber properties.

## References

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Table 1. Effect of varieties on fiber properties across years, locations and treatments.

Variety	Lint%	Micronaire	UHM	UI	G/TEX	EL	AREA
DPL5415	38.21a	5.24b	1.11a	85.63b	28.71b	6.56b	441.55a
H1220	38.49a	5.17b	1.16a	86.39a	28.51b	7.14a	446.94a
SG404	36.11b	5.46a	1.16a	86.79a	30.85a	6.23c	425.28a

Fiber property means followed by the same letter are not significantly different at p=0.05.



Fig. 1. Effect of treatments on lint% and g./tex across years, locations and varieties.

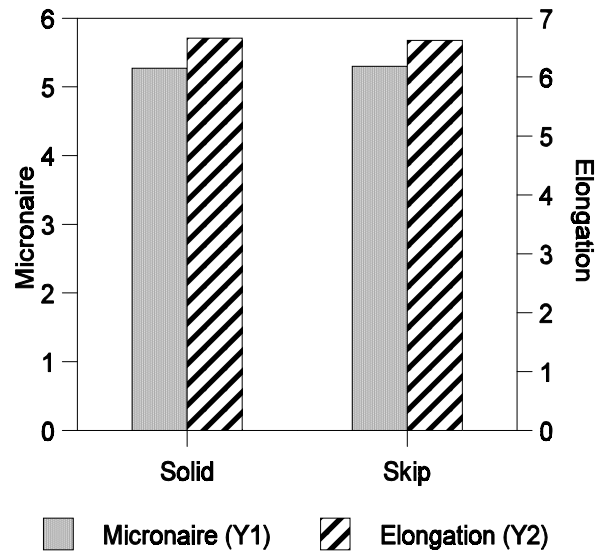


Fig. 2. Effect of treatments on micronaire and elongation across years, locations and varieties.

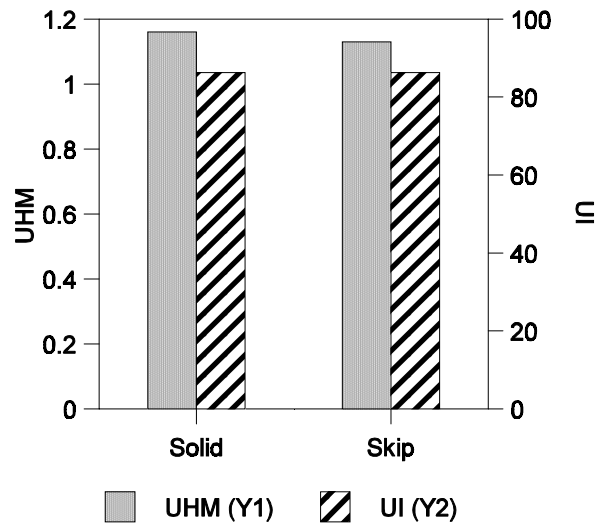


Fig. 3. Effect of treatments on UHM and UI across years, locations and varieties.