

EVALUATION OF SKIP ROW PLANTING PATTERN FOR COTTON IN THE HILLS

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ABSTRACT: Cotton yields of the Hill Section of Mississippi could be greatly enhanced if water was available to the plant during the time of boll set, filling and maturation. This time period occurs from the last week of July to first week of September. Late season stress has been noted for causing boll shedding, small bolls, immature fibers and reduced yields. If yields are to increase in the Hills there is need to supply supplemental water to the crop or develop a management system where water is reserved in the soil and comes available to the plant during August. Average rainfall in the Hill Section of Mississippi is approximately fifty inches annually. August is the second driest month of the year averaging three inches of rain and a daily pan evaporation of one-half inch. The August rainfall averages, however, are misleading because tropical storms and hurricanes that came through Mississippi about every five years during August inflate the averages. Boll maturation and filling are occurring during this time when cotton is severely drought stressed from 2-6 weeks. Our study was the first year for a 2X1 skip pattern. We found a 27% increase in yield on a row basis when planting cotton in a skip pattern versus a solid row planting. However, on a land acre the solid planted cotton yield was higher.

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MATERIALS AND METHODS: Cotton was planted on beds in the first week of May in a skip row pattern. The land had been disked, hipped and do-alled previous to planting. Fertilizer was spread by a custom applicator according to soil test recommendations prior to any fieldwork. Field was planted in Deltapine 451BR variety of cotton with approximately 4 seed per foot of row. Terrachlor 18.8 G Granlues (pentachloronitrobenzene) 1.5 lb ai/ac. + Temik 15 G (aldicarb) 0.75 lb ai/ac was applied in furrow at planting. Cotoran (fluometuron) at 1.0-lb ai/ac was broadcast sprayed over the entire plot area behind the planter. The skip rows were kept free of weeds and grasses with a Roundup (Glyphosate) at 1.0 ai/ac spray during cultivation. Cotton was defoliated in the first week of October and picked the middle of October.

RESULTS AND DISCUSSION: Today most of the cotton grown in the Hills is either grown no-till or stale seedbed. Spring tillage for cotton is infrequently used in North Mississippi. No-till has resulted in conservation of soil moisture allowing adequate moisture for germination and early plant development. Even with plentiful soil moisture in the spring, water deficits have occurred in plants as early as July in no-till cotton since the Hills have shallow soils with limited water holding capacity. Irrigation has shown to increase boll retention later in the season in tilled and no-tilled cotton. Soil water removal is rather uniform in cotton planted in 40-inch rows. In a 2x1 skip row pattern, there is up to 2 inches more available moisture in the skip row. This water is available to the plant and may account for much of the yield increase per unit of row length.

Cotton has been grown in skip-row patterns in the Delta for many years. Hill producers have been exposed to skip-row cotton production in the past but it was not advantageous to the Hill producer because of a shortage of suitable production acreage. Today with no government acreage controls producers are free to seek their most profitable crop mix. In the 1950's cotton planted at the North Mississippi Branch Station in a 4x4 skip pattern increased yields by 815 lbs of seed cotton per land acre over solid planted cotton. A 4x4 pattern doubles the acreage needed for skip-row cotton. Similar results had been obtained in dryland production in the delta where on a land acre the yields were 295 lbs. lint higher or 32%. A more practical system for the Hill Section is a 4x1 skip pattern or a 2x1 skip pattern. A 30 percent increase in yields was obtained on the outside rows of the 4x1 skip. The 2x1 skip pattern had land yields equal to those of the solid planted cotton.

The potential economic outcome of any production system is the major factor in determining its acceptability. Parvin, et al. (2000) stated "According to conventional wisdom low prices favor skip-row planting patterns while

high prices favor solid planted cotton”. Dry land cotton farmers with mostly Class II and III soils that have historically planted solid cotton probably should consider skip-row cotton. A 2x1 skip row pattern with materials applied down the row are 67% of the solid planted cotton. The yield reduction should be considered less than the reduction in linear feet of row or about 88-96% of solid on a land acre basis.

Our study was the first year for a 2X1 skip pattern. We found a 27% increase in yield on a row basis when planting cotton in a skip pattern versus a solid row planting. However, on a land acre, the solid planted cotton yield was higher (Table1.)

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Figure 1. Yield comparison between 2X1 skip row cotton and solid planted cotton for the Hill Section.

<u>Planting Pattern</u>	<u>Yield in pounds of lint per acre</u>
Solid planted	985
2X1 Skip Planted	1350
LSD 0.05	89
C V %	12