2004 BELTWIDE COTTON CONFERENCES, SAN ANTONIO, TX – JANUARY 5-9

EVALUATION OF SKIP-ROW COTTON ON THE TEXAS UPPER COAST

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Abstract

In this study, cotton yields were significantly reduced with skip-row when compared to conventional planted cotton. The number of days to cutout was increased significantly for skip-row cotton. A partial budget was developed to compare differences in costs and returns for the two planting patterns. Net returns per acre were higher for the conventional planted cotton. Input costs were reduced with skip-row; however, reduced costs were offset by the increased yields and higher revenue in the conventional planted cotton.

Introduction

Reduced inputs from skip-row planted cotton include less seed being planted and associated reduction in technology fees. Also, in-furrow insecticides, fungicides, starter fertilizers, and banded pre-emergence herbicides can be reduced with skip-row planted cotton. With equipment modifications, more land area is covered with planters and harvesters increasing the efficiency of these operations. However, in Georgia cotton yields were generally reduced with skip-row in high yielding environments (Jost et al., 2003). This field study was conducted to compare the yield and net returns of skip row (2x1) to conventional planted cotton.

Materials/Methods

A field study was conducted at Arthur Mahalitc & Sons dryland farm located south of Eagle Lake in Colorado County. Fiber Max 832B was planted on April 1, 2003 into a Norwood soil. A 2x1 skip-row planting pattern was compared to conventional planted cotton at two different seeding rates (33,800 and 50,820 seed/acre). Treatments were arranged in a 2x2 factorial experiment in a randomized complete block design. Each treatment was replicated three times. Rows were spaced on 36-inch centers. Plot sizes were eight rows by 900 feet long. For the skip row treatments, a 2x1 configuration was obtained by not planting rows three and six.

Treatment effects were assessed by utilizing COTMAN to record nodes above white flower counts on a weekly basis until cutout (NAWF=5) date. Weekly nodes above white flower values were obtained by sampling ten plants from each plot. Twenty plants per plot were measured at the end of the season to determine final plant height. Number of bolls and number of bolls to produce a pound of lint were obtained by hand-harvesting one-thousandth of an acre at three different places in each plot. Seed cotton yields were obtained by machine harvesting the middle two rows of each plot and weight was determined with a portable cotton weigh wagon. A grab sample of approximately 600 grams of seed cotton from each of the plots was ginned on a 10-saw Eagle laboratory gin to determine lint yield and turnout. Fiber samples were sent to the International Textile Center at Lubbock, Texas for quality measurement determination.

A partial budget was developed for the economic analysis. Only the costs that vary between the treatments were considered in this approach. Net advantage per acre was considered to be the difference in treatment variable costs subtracted from the difference in the crop value for the respective treatments.

Input savings included seed, technology fee, in-furrow insecticide, banded herbicide application and picking charge per acre. The test was planted at 3.5 seed/foot (50,820 seeds per acre conventional and 33,800 seeds per acre skip-row), Temik 15G was applied at 3.0 lbs/acre, and Fluometuron 4L (.75 pints/acre) + Dual II Magnum (.4 pints/acre).

Four row harvesting equipment was used, and it was assumed that four rows of cotton were picked without operating a picker head in an unplanted row. The efficiency of the skip-row picking operation was assumed to increase 24% in relation to conventional planted due to this modification. The cost of the assumed picker modification was included in the partial budget.

Statistical analysis used was the general linear model in SAS (8.2) and means were separated using Fisher's Protected LSD at the 5% level.

Results

Significant differences in number of days to cutout were found between the skip-row (92.33 days) and conventional row (87.83 days) treatments. No significant differences in number of days to cutout were found between the two plant populations (Table 1).

Final plant height was significantly higher for the skip-row pattern compared to the conventional planted cotton. However, no significant differences were observed between the two plant populations (Table 2).

Total number of bolls was significantly higher for the conventional row versus the skip-row planted cotton. No differences in total number of bolls were found between the two plant populations (Table 3). No significant differences in number of bolls to produce a pound of lint were found between the two planting patterns and the two plant populations (Table 4).

Lint yield was significantly higher for the conventional row (1342 lbs/acre) versus the skip-row (1202 lbs/acre) planted cotton. However, no significant differences were observed between the two plant populations (Table 5).

No significant differences in length, micronaire, strength, elongation, and uniformity were found between the two planting patterns and the two plant populations.

Costs associated with the skip-row pattern were $45.44 less per acre; however, net returns for conventional planted cotton were $37.58 per acre more than skip-row due to the increased lint and cotton seed yields (Table 6). The $45.44 per acre cost differential includes savings from skip-row picking efficiency and ginning costs savings due to lower yields in the skip row planted cotton. In a three year study in Mississippi, an average of $66.36 in direct costs and $18.75 in fixed costs were saved in skip-row cotton production (Parvin et al., 2002). Because the Mississippi study assumed a change to a larger equipment complement that is not applicable to this study, only fixed costs savings related to the per acre picking charge were include in this study.

Conclusions

Overall production costs were reduced with the skip-row planted cotton. However, lint yield was significantly less when compared to conventional planted cotton in this high yielding environment. Net returns were higher from the conventional planted cotton. Reduced input costs from the skip-row planted cotton were not enough to offset the higher yields from the conventional planted cotton. Number of days to cutout was increased significantly with skip-row planted cotton, which means more days exposed to end of season rainfall from tropical storms and hurricanes.

Acknowledgments

We appreciate the Mahalitc family for their continued support, labor, and equipment in conducting this field study and to Jim Bosch, Technical Service Agronomist, Delta and Pine Land Company, for his help with the harvesting of this test.

References

Jost, P.H., S.M. Brown, D. Shurley, R. McDaniel, and B. McNeill. 2003. Evaluations of skip-row cotton in Georgia. Proceedings of Beltwide Cotton Production Conference, Nashville, TN.

Parvin, D.W., J.W. Burkhalter, F.T. Cooke, and S.W. Martin. 2002. Three years experience with skip-row cotton in Mississippi, 1999-2001. Proceedings of Beltwide Cotton Production Conference, Atlanta, GA.

Table 1. Number of days to cutout (NAWF = 5)

Plant pop.	Skip row	Conventional	Pr > F .2644
50,820	92.00	87.00	89.50 a
33,800	92.67	88.67	90.67 a
Pr > F .0032	92.33 a	87.83 b	

Table 2. Final plant height (inches)

Plant pop.	Skip row	Conventional	Pr > F .8028
50,820	39.08	34.25	36.67 a
33,800	39.50	34.33	36.92 a
Pr > F .0020	39.29 a	34.29 b	

Table 3. Total number of open bolls (1000's/acre)

Plant pop.	Skip row	Conventional	Pr > F .1321
50,820	284.99	336.99	310.99 a
33,800	282.02	318.01	300.02 a
Pr > F .0004	283.51 a	327.50 a	

Table 4. Number of bolls to produce a pound of lint

Plant pop.	Skip row	Conventional	Pr > F .2560
50,820	219.00	229.67	224.33 a
33,800	224.33	214.67	219.50 a
Pr > F .9009	221.67 a	222.17 a	

Table 5. Lint yield (pounds per acre)

Plant pop.	Skip row	Conventional	Pr > F .5413
50,820	1192	1366	1279 a
33,800	1211	1317	1264 a
Pr > F .0009	1202 b	1342 a	

Table 6. Partial budget production costs for conventional and skip-row planted cotton, Texas Upper Gulf Coast, 2003.

	Conventional	Skip row	
Yield (lint pounds/acre)	1342	1201	
Turnout	36.99%	35.89%	
Seed cotton yield (lbs per acre)	3628	3346	
Cotton seed yield (lbs per acre)	2147	1922	
Lint value per acre at loan	$693.81	$620.92	$72.89
Cotton seed value per acre @ $90/ton	$96.62	$86.49	$10.13
Seed cost ($ per acre)	$14.39	$9.57	($4.82)
Technology fee ($ per acre)	$13.49	$8.97	($4.52)
In furrow insecticide cots ($ per acre)	$9.90	$6.60	($3.30)
banded herbicide cost ($ per acre)	$8.09	$5.39	($2.70)
Calculated picking charge ($ per acre)	$64.15	$46.74	($17.41)
Ginning cost per acre	$120.78	$108.09	($12.69)
Advantage for conventional per acre			37.58