SKIP-ROW COTTON IN GEORGIA

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Abstract

Low commodity prices and high production costs have led producers to search for less expensive ways to produce a cotton crop. Skip-row cotton has received much attention of late as a possible avenue to achieve this goal. In 2001, 2-n-1 (full), 4-n-1 (full), 2-n-1 (modified) and 4-n-1 (modified) skip-row patterns were examined in four locations across Georgia. Yields and Net Returns, using a partial budget analysis, were calculated for these patterns compared to conventionally planted cotton. Collectively, these data showed that full skips offered larger savings opportunities than modified skips, and that 2-row patterns offered larger savings opportunities than 4-row patterns. No skip-row pattern yielded significantly more than the conventional planting pattern, nor did any skip-row pattern significantly increase net returns. However, trends in the data suggest that a 2-n-1 (modified) pattern has the potential to increase net returns especially in lower yielding areas. In tests where the maximum yield was less than 1000 lbs/A this pattern consistently had numerically greater returns than the conventionally planted cotton. It must also be considered that the partial budget analysis was extremely conservative and left out many savings opportunities that could be attained in certain situations.

Introduction

Cotton producers have faced extremely low commodity prices and high production costs in the recent past. All this has resulted in an ever-decreasing profit margin, and caused producers to search for alternative production methods. One method that has received much attention of late is skip-row production. In this practice not every row is planted, thus leaving a set area of land out of production in an established pattern. This is not a new technique, however, past use of this practice had been linked to farm bill legislation existing at the time. Currently, growers are interested in skip-row strictly due to the potential to reduce production costs and increase the profit margin.

Any economic advantages to skip-row planting compared to conventional solid planting are related to (1) reduction in "down the row" expenses, (2) savings in field time if the skip row pattern results in wider coverage of ground with each trip across the field, and (3) possible reduction in some "per acre" expenses due to less cotton per land acre compared to conventional planting. Several studies were conducted across the state of Georgia to examine varying patterns of skip-row cotton and their ultimate impact on profit compared to a conventional system.

Materials and Methods

Skip Row Patterns

The patterns examined were 2-n-1 (full), 4-n-1 (full), 2-n-1 (modified) and 4-n-1 (modified). In a 2-n-1 (full) pattern or 4-n-1 (full) pattern two or four rows are planted for every full row skipped, respectively. The modified patterns utilize a 50-inch skip instead of a full row width. In these tests the conventional row spacing was either 36 or 38 inches, depending on location.

This report presents the results of four trials conducted in Georgia at 3 locations in 2001. An irrigated, strip-till trial was conducted at the Conservation Tillage Farm in Burke County on 38-inch rows. Both irrigated and non-irrigated trials were conducted at the Southeast Georgia Branch Experiment Station in Midville on 38-inch rows. An irrigated trial was conducted at the Coastal Plain Experiment Station in Tifton on 36-inch rows.

Data Collected

Seed cotton yields were collected via machine harvesting in all tests. These values were then converted to lint yields per acre of land.

Economic Analysis

A "partial budget" approach was used for the economic analysis. Only those costs that vary between the treatments were considered with this approach. Quality data was not yet available; therefore, the cotton was valued at 53.6 cents per pound (November cash price including LDP less 6.4 cents per pound net (after cottonseed) cost of ginning, warehousing, and fees). Net Return was considered to be the treatment variable costs included in the partial budget subtracted from the crop value. Total production costs were not included; therefore Net Returns were subsequently inflated.

Table 1 shows the "down the row" input savings calculated for the tests at Burke County and Midville where 38-inch rows were used and Table 2 shows these data from Tifton where 36-inch rows were used. "Down the row" input savings included seed, technology fee, and in-furrow insecticide. All other inputs were considered broadcast. The Burke County and Midville tests were planted at the rate of 3.5 seed/foot and Temik was applied in-furrow at the rate of 3.5 lbs/A. At Burke County, the cotton was strip-tilled and ripped under the row. At Midville and Tifton, conventional tillage practices were used consisting of ripping and bedding the land prior to planting. The Tifton test was planted at the rate of 3 seed/foot and the Temik rate was 3.5 lbs/A.

If employing a skip row pattern results in a wider area of land covered in each trip across the field, corresponding savings also accrue. Therefore, tractor fuel and repairs, planting labor, picker fuel and repairs, and picker/buggy/module labor savings were included. In budgeting the cost of each system, 8-row planting equipment was assumed and it was further assumed that 8 rows would be planted in each pass across the field except with the 2-n-1 (full) pattern. It was calculated that only 6 rows were planted with the 2-n-1 (full) pattern, and 2 planter units were removed. Planter modifications can require as little as 24-36 additional inches or as many as 72-76 inches. The cost of these modifications was not included in the analysis. If planters are not modified, producers may have to decrease the number of rows covered in each trip across the field to achieve the desired pattern (dropping from 8 rows to 6 rows or from 6 rows to 4 rows, for example). If this occurs "down the row" savings would be maintained, but time savings at planting would not be realized. Harvesting was assumed to be achieved with a 4-row picker, and that four rows of cotton were picked without operating a picker head in an unplanted row. The cost of picker modification was not included in the budget.

All data were subjected to ANOVA. Means were separated using Fisher's Protected LSD.

Results and Discussion

Tables (3 thru 5) show the costs of production for each skip-row pattern at each location. Collectively these data demonstrated that full skips offer larger savings opportunities than modified skips, and that 2-row patterns offer larger savings opportunities than 4-row patterns. Overall savings in the production costs that were analyzed ranged from $6.25 to $31.23/A.

Yield and Net Returns are shown in Figures (1 thru 4). No skip-row pattern yielded significantly more than the conventional planting pattern. However, significant yield reductions were observed with the 2-n-1 (full) pattern at two locations. The 2-n-1 (modified) pattern did not yield significantly different from the conventionally planted cotton at any location.

While Net Returns were not significantly improved with any skip-row pattern, there were some trends observed. In the Burke County and non-irrigated Midville trial the 2-n-1 (modified) pattern had Net Returns of $29.90 and $11.07/A above the conventional treatment, respectively. These two tests had average yields of less than 1000 lbs/A. In the other two tests yields averaged much greater than 1000 lbs/A, and no tendencies for increases in Net Returns were observed. These data suggest that the 2-n-1 (modified) pattern has the potential to increase the profit margin in lower yielding situations.

This analysis is for one year of results only. Further study and more in-depth analysis is needed. Other factors such as different or more use of "down-the row" inputs (such as fertilizer, banded herbicides, etc.) and possible savings on fees and crop insurance premiums need to be calculated. Costs of equipment modification, if needed, will also require consideration.

In summary, the "partial budget" analysis was extremely conservative. The savings included in the analysis are those that the majority of producers could attain with minimal changes in equipment and production practices. There is the potential for greater savings in the areas of defoliant, insecticide and growth regulator applications, since these inputs do not need to be applied to the unplanted area. Also, fertility rates were not altered in these tests. It is possible that these rates may be reduced somewhat since less land area is being planted. A final consideration is the 2001 harvest season experienced in Georgia. Extremely low humidity, low rainfall and warm temperatures typified the fall season. Therefore, boll rot was not a factor. In a more typical year a significant portion of the crop may be lost to boll rot. Due to the more open canopy in skip-row, boll rot losses may be reduced, and this may have an impact on overall yield.

Table 1. Skip-row planting and harvesting widths and percent "down-the-row" and time savings compared to conventional 38-inch row spacing.

	Planting 8 rows			Harvesting 4 rows	
	Width (inches)	Input Savings (%)	Time Savings (%)	Width (inches)	Time Savings (%)
Conventional	304	0	0	152	0
2-n-1 (full)	342	33.3	12.5	228	50.0
4-n-1 (full)	380	20.0	25.0	190	25.0
2-n-1 (mod.)	352	13.6	15.8	176	15.8
4-n-1 (mod.)	328	7.3	7.9	164	7.9

Table 2. Skip-row planting and harvesting widths and percent "down-the-row" and time savings compared to conventional 36-inch row spacing.

	Planting 8 rows			Harvesting 4 rows	
	Width (inches)	Input Savings (%)	Time Savings (%)	Width (inches)	Time Savings (%)
Conventional	288	0	0	144	0
2-n-1 (full)	324	33.3	12.5	216	50.0
4-n-1 (full)	360	20.0	25.0	180	25.0
2-n-1 (mod.)	344	16.3	19.4	172	19.4

Table 3. Partial budget production costs for conventional and skip-row planted cotton, Burke County, Georgia, 2001.

	Planting				Harvesting		
	Seed and Tech Fee	In-furrow Insecticide	Tractor	Labor	Picker	Labor	Total
Conventional	$48.87	$10.50	$1.48	$1.53	$12.81	$8.46	$83.65
2-n-1 (full)	$32.59	$7.00	$1.30	$1.34	$6.41	$4.23	$52.87
2-n-1 (mod.)	$42.22	$9.07	$1.25	$1.29	$10.79	$7.12	$71.74
4-n-1 (mod.)	$45.30	$9.73	$1.36	$1.41	$11.80	$7.79	$77.40

Table 4. Partial budget production costs for conventional and skip-row planted cotton, Irrigated and Dryland-Midville, Georgia, 2001.

	Planting				Harvesting		
	Seed and Tech Fee	In-furrow Insecticide	Tractor	Labor	Picker	Labor	Total
Conventional	$50.27	$10.50	$1.42	$1.49	$12.81	$8.46	$84.95
2-n-1 (full)	$33.54	$7.00	$1.24	$1.30	$6.41	$4.23	$53.72
4-n-1 (full)	$40.22	$8.40	$1.06	$1.12	$9.61	$6.34	$66.75
2-n-1 (mod.)	$43.44	$9.07	$1.20	$1.25	$10.79	$7.12	$72.87
4-n-1 (mod.)	$46.60	$9.73	$1.31	$1.37	$11.80	$7.79	$78.61

Table 5. Partial budget production costs for conventional and skip-row planted cotton, Tifton, Georgia, 2001.

	Planting				Harvesting		
	Seed and Tech Fee	In-furrow Insecticide	Tractor	Labor	Picker	Labor	Total
Conventional	$43.98	$10.50	$1.50	$1.57	$14.00	$8.91	$80.46
2-n-1 (full)	$29.33	$7.00	$1.31	$1.37	$7.00	$4.46	$50.48
4-n-1 (full)	$35.18	$8.40	$1.13	$1.18	$10.50	$6.68	$63.07
2-n-1 (mod.)	$36.82	$8.79	$1.21	$1.26	$11.28	$7.18	$66.53

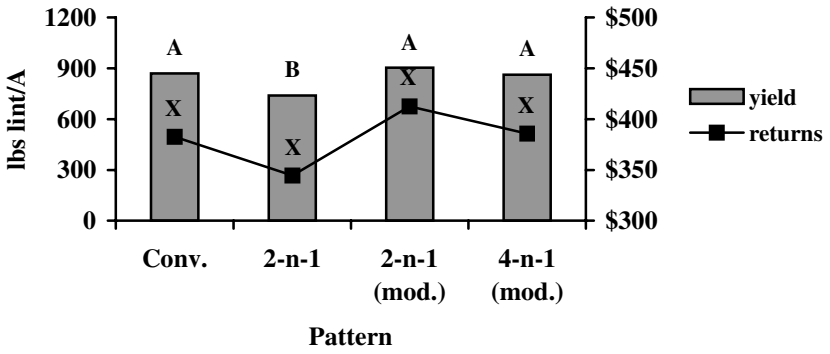

Figure 1. Yield and Net Returns from conventional and skip-row planted cotton, Burke County, Georgia, 2001.

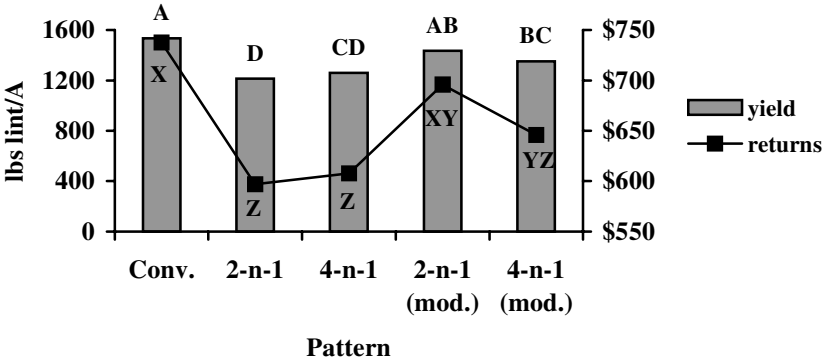

Figure 2. Yield and Net Returns from conventional and skip-row planted cotton, Irrigated-Midville, Georgia, 2001.

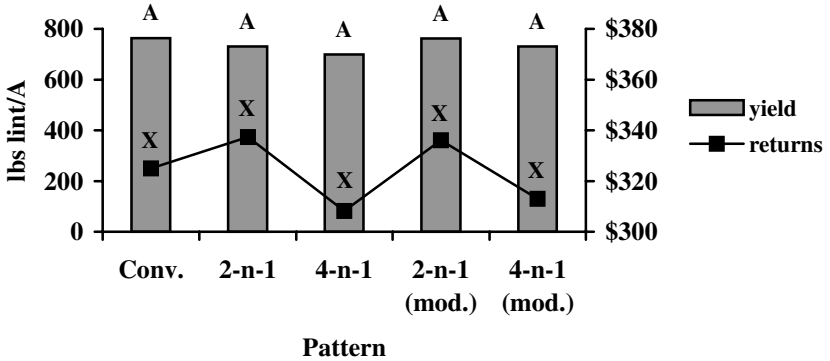

Figure 3. Yield and Net Returns from conventional and skip-row planted cotton, Dryland-Midville, Georgia, 2001.

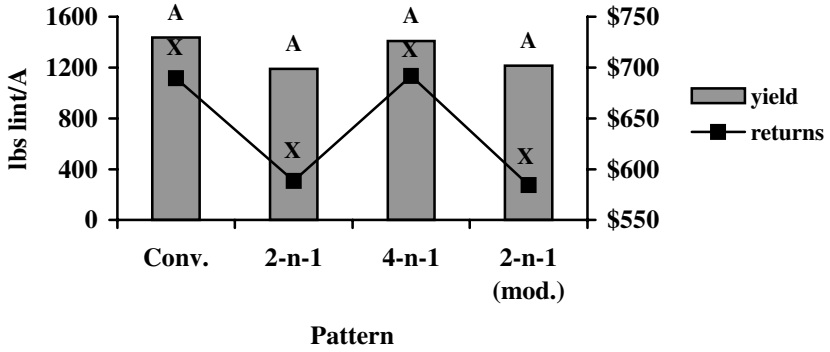

Figure 4. Yield and Net Returns from conventional and skip-row planted cotton, Tifton, Georgia, 2001.