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EVALUATIONS OF SKIP-COTTON IN GEORGIA

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Abstract

Low prices and high production costs have led cotton producers to search for methods to increase the profit margin. Skip-row cotton has received much attention of late as a possible avenue to achieve this goal. In 2001 and 2002, 2x1 and 4x1 skip-row patterns were examined in East Georgia. Yields and Net Returns, using a partial budget analysis, were calculated for these patterns compared to conventionally planted cotton. Cotton yields were generally reduced with skip-row, and the reduction in yield was greater in higher yielding environments. In relation to conventionally planted cotton, Net Returns with skip-row cotton tend to increase in lower yielding environments and decrease in higher yielding environments. It must be considered, however, that the partial budget analysis was extremely conservative and left out many savings opportunities that could be attained in certain situations.

Introduction

The cost to produce a cotton crop is ever increasing. Cotton producers in Georgia are interested in agronomic practices that have the potential to reduce these input costs and thereby increase profits. One method that has received attention recently is skip-row cotton. With skip-row cotton planting certain inputs can be reduced compared to conventionally planted cotton. For example fewer seed are planted per acre with skip-row thus seed costs and associated technology fees are reduced. Also, many other "down the row" inputs such as in-furrow insecticides, starter fertilizers, and banded preemergence herbicides can be reduced with skip-row planting. Finally, with equipment modifications, more land area is covered with planters and harvesters increasing the efficiency of these operations.

Several studies were conducted across the eastern half of Georgia in 2001 and 2002 to examine varying patterns of skip-row cotton and their ultimate impact on yield and profit compared to a conventional system.

Materials and Methods

Skip Row Patterns

The patterns examined were "2x1" and "4x1". In these patterns two or four rows are planted for every full row skipped. In these tests the conventional row spacing was 38 inches.

This report presents the results of six trials conducted in Georgia at 2 locations in 2001 and 2002. Irrigated, strip-till trials were conducted at the Conservation Tillage Farm in Burke County. Both irrigated and non-irrigated trials were conducted at the Southeast Georgia Branch Experiment Station in Midville.

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. 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.

"Down the row" input savings included seed, technology fee, and in-furrow insecticide. All other inputs were considered broadcast. These 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. In Midville conventional tillage practices were used consisting of ripping and bedding the land prior to planting.

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 2x1 pattern. In this pattern it was calculated that only 6 rows were planted and 2 planter units were removed. The costs of these modifications were not included in the analy-

sis. 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 timesavings at planting would not be realized. 4-row harvesting equipment was assumed, and it was assumed 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 analyzed via linear regression. In these analyses the independent variable was conventional cotton yields, referred to as a yield environment. The dependent variables in these analyses are the yields and Net Returns of conventional cotton and the 2x1 and 4x1 skip-row patterns.

Results

Production Costs

Table 1 shows the total costs of production calculated via the partial budget analysis for the conventionally planted cotton and each skip-row pattern. Total savings in production costs for skip-row over conventional cotton were $17.55 and $31.00 for the 4x1 and 2x1 patterns, respectively

Yield

Figures 1 and 2 show the relationship of skip-row yields to conventionally planted cotton. In these graphs the resulting equation from regression analysis of skip-row and conventionally planted cotton yields is plotted. The slope of the equation representing the yield of the conventionally planted cotton is 1. Both the 2x1 and 4x1 skip-row patterns had significantly different slopes from the conventionally planted cotton. These different slopes indicate that yield relationship between skip-row and conventionally planted cotton is not consistent across yield environments. These data demonstrate that as the yield of conventionally planted cotton increases there is a greater reduction in the yield of skip-row cotton. As the yield of conventional cotton decreases, the yield reduction with skip-row decreases.

Net Returns

Figures 3 and 4 show the relationship of skip-row Net Returns to conventionally planted cotton. In these graphs the resulting equation from regression analysis of skip-row and conventionally planted cotton Net Returns is plotted. The slope of the equation representing the Net Returns of conventionally planted cotton is 0.536, the price per pound of lint. Both the 2x1 and 4x1 skip-row patterns had significantly different slopes from the conventionally planted cotton. These different slopes indicate that the net return relationship between skip-row and conventionally planted cotton is also not consistent across yield environments. As with the yield data, this analysis indicates that the Net Returns of skip-row cotton begin to approach and ultimately surpass the Net Returns of conventional cotton in lower yielding environments. In higher yielding environments the Net Returns with skip-row are actually less than with conventional cotton. The regression equations of Net Returns for the 2x1 and 4x1 patterns are equal to the conventional cotton at yield environments of 585 and 521 lbs/A, respectively. While the data is still somewhat limited, these yield levels could be considered the break even points for skip-row at the savings calculated in these studies.

Discussion

Collectively, these data indicate that overall production costs can be reduced with skip-row cotton in East Georgia. These data also indicate that there is a yield sacrifice with skip-row production, and that this reduction in yield is exacerbated in higher yielding environments. In lower yielding environments, where the yield reduction is less with skip-row there is the potential to increase profits. In higher yielding environments the yield reduction incurred is too great to be overcome with the savings in production costs used in these experiments. For example, in these studies a maximum of $31.00/A was saved with the 2x1 pattern. This figure does not include any fixed costs, and only includes a conservative estimate of direct cost savings. In a 3-yr study in Mississippi, an average of $66.36 in direct costs and $18.75 in fixed costs were saved (Parvin et al., 2002). If the savings accrued are increased the present study the yield environment below which skip-row cotton becomes more profitable will increase.

References

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

Table 1. Partial budget production costs for conventional and skip-row planted cotton, East Georgia, 2001 and 2002

	Planting				Harvesting		
	Seed and Tech Fee	In-furrow Insecticide	Tractor	Labor	Picker	Labor	Total
Conventional	$49.57	$10.50	$1.45	$1.51	$12.81	$8.46	$84.30
2x1	$33.07	$7.00	$1.27	$1.32	$6.41	$4.23	$53.30
4x1	$40.22	$8.40	$1.06	$1.12	$9.61	$6.34	$66.75

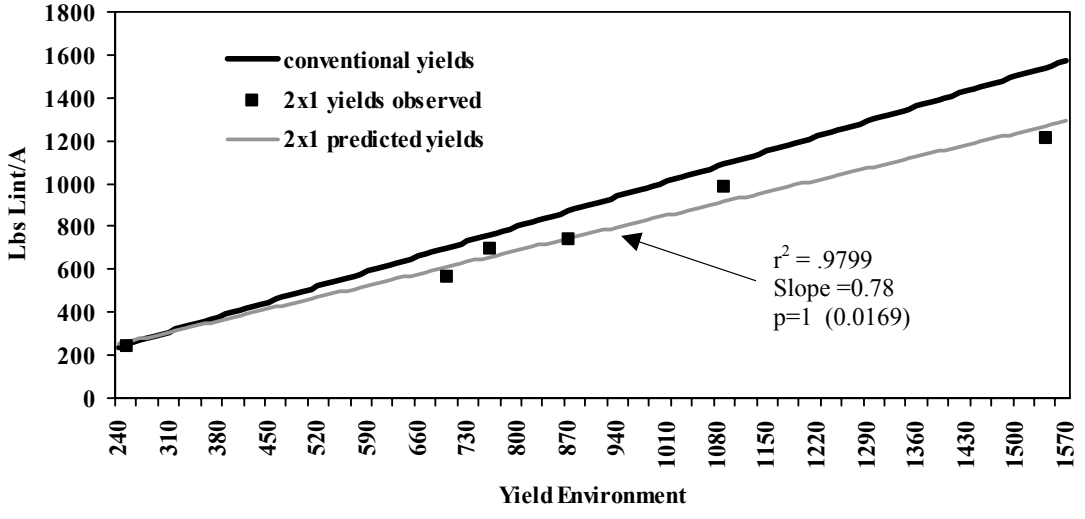

Figure 1. Linear regression of 2x1 full skip yields as a function of conventional yields.

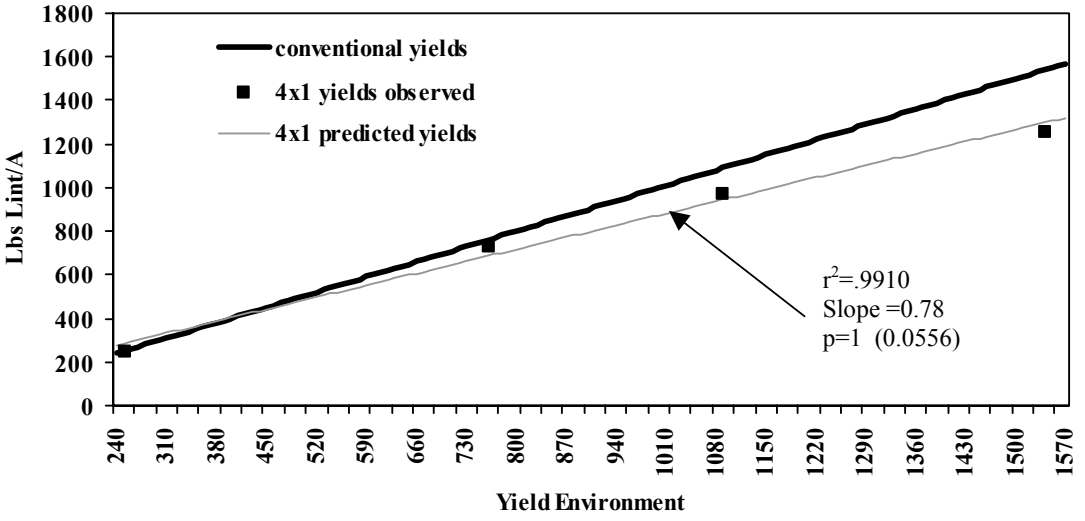

Figure 2. Linear regression of 4x1 yields as a function of conventional yields.

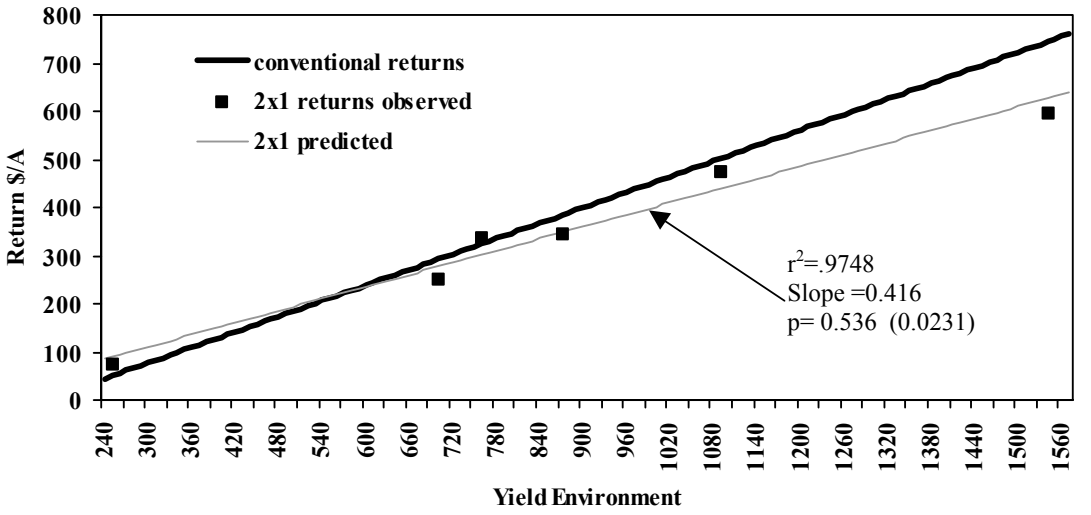

Figure 3. Linear regression of 2-n-1 full skip net returns as a function of conventional yields.

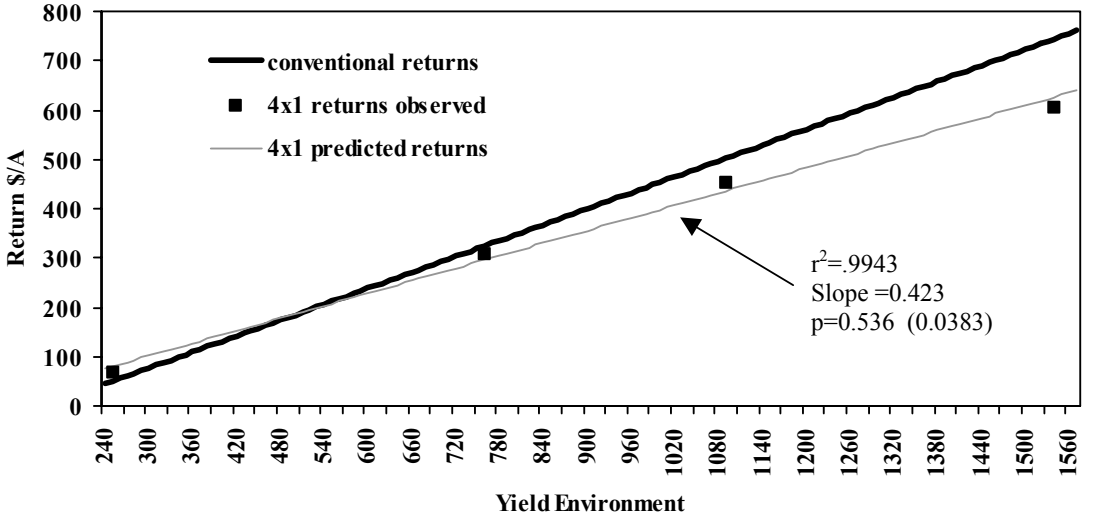

Figure 4. Linear regression of 4x1 net returns as a function of conventional yields.