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

COTTON TILLAGE CHARACTERISTICS IN THE MISSISSIPPI DELTA

Steven W. Martin and Fred Cooke
Delta Research and Extension Center
Mississippi State University
Stoneville, MS

Abstract

Tillage can represent a significant portion of cotton producers' cost of production. Additionally, water quality and soil loss parameters can affect the ability to use certain tillage practices. Research at the Delta Research and Extension Center in Stoneville, Mississippi has focused on cost of production of various tillage systems for the past four yearsCompared to the southern or national average, the Mississippi Delta has a higher percentage of no-till and conservation tillage adoption among cotton producers. Mississippi Delta cotton producers practice no-till on 27% on their total acres and 38% of their cotton acres. Beltwide, cotton producers practice no-till on 14% of their cotton acreage (table 12). Mississippi Delta cotton producers use conservation tillage practices on 51% of total acres and 48 % of cotton acres. Beltwide, cotton producers perform conservation tillage on 15% of their cotton acres. No-till and conservation tillage account for 86% of the tillage practices on cotton acres in the Mississippi Delta.

Introduction

Tillage can represent a significant portion of cotton producers' cost of production. Additionally, water quality and soil loss parameters can affect the ability to use certain tillage practices. Research at the Delta Research and Extension Center in Stoneville, Mississippi has focused on cost of production of various tillage systems for the past four years. In an effort to provide a baseline of current tillage practices and what direction tillage research should take in the future, information was needed about the current state of tillage practices among cotton producers. Thus, in the summer of 2003 a mail survey was conducted to obtain tillage practice information from Mississippi Delta cotton producers.

Methods

In the summer of 2003, mail survey questionnaires were sent to cotton producers in the Mississippi Delta. The survey sought to obtain information regarding tillage practices on the producers' farms. Producers were asked to categorize production acres into one of three tillage practices; no-till, conservation till or conventional tillage. No-till was defined as no tillage trips across the field (one tillage trip allowed only for correcting deteriorated row conditions). Conservation tillage was defined as 1-3 tillage trips with no mechanical cultivation. Conventional tillage was defined as more than three tillage trips and to include mechanical cultivation. Questions were also asked regarding farm size, soil type, labor and land forming. Cotton producer mailing lists were obtained from MSU-ES county agricultural agents located in the Mississippi Delta. The mailing lists contained 1800 names. From these lists, 450 farms were randomly selected. Returned questionnaires totaled 142 for a response rate of 31.6%. Of the 142 questionnaires returned, 31 were returned as no longer farming and 10 were unusable. Thus, 101 were included in the analysis.

Results

Respondents to the survey reported 240,552 tillable acres out of a total of 247,326 farm acres. No-till acres accounted for 63,919 acres with 121,900 and 54,733 being in conservation and conventional tillage, respectively. No-till acres accounted for 26.6% of all tillable acres, conservation tillage 50.7% and conventional tillage 22.8% (table1). When only cotton acres are considered (table 7), 38% of the tillable acres in cotton production were no-till, 49% were conservation till and only 13% were conventional tillage. The Conservation Information Technology Center at Purdue University reports 15% no-till cotton acres and 69% conventional tillage cotton acres in the southern region of the United States (table12).

Table 3 presents tillage practices for three farm size categories. As can be seen in the table the percentage of acres in each tillage practice does not change much depending on farm size. The largest percentage of no-till (27.9%) was on the larger farms (>2500 acres) with the lowest percentage of no-till (22.3%) on the "medium" sized farms (1500-2500 acres). Conventional tillage was greatest (26.3%) among the "medium" sized farms and lowest (16.4%) among the smallest farm size category (<1500 acres). When only cotton acres are considered (table 8), conservation tillage was the predominate practice across all farm sizes. As farm size increased the percentage of no-till acres increased as well with the larger farm category (> 2500 acres) practicing no-till on over 40% of cotton acres.

Labor savings have been mentioned as a possible benefit of no-till and reduced tillage systems. Respondents to the survey indicated this might be the case. Respondents reported 159 acres per laborer for no-till, 150 acres per labor for conservation

tillage, and only 132 acres per laborer for conventional tillage (table 4). However, when only cotton acres are considered (table 9) respondents reported more acres per laborer for conservation tillage (267) than for no-till production (202). Conventional tillage still had the least acres per laborer at 145. The lower acres per laborer for no-till cotton may be a function for labor needed for harvest. Harvest constitutes the largest labor requirement for cotton production. The survey did not address harvest labor issues. Thus, this cannot be fully explained with the survey.

Respondents to the survey indicated their farms consisted of approximately 38% sandy soils and 39% mixed soil types with the remaining 24% being clay soils (table 4). Cotton acres consisted of 56% sandy soils, 35% mixed soils and 9% clay soils (table 10).

Table 5 reports percentage tillage practices used on each of the soil types. Tillage practices were fairly consistent for each soil type with the exception of conservation tillage on mixed soil being somewhat the dominant practice.

Table 6 reports land formed acres and percentage of land formed acres for each tillage practice. There were 120,283 land formed acres reported in the survey. This represents 50% of total tillable acres. The majority of land formed acres (56%) were in conservation tillage, with 33% in no-till and only 11% in conventional tillage. There were 68,137 land formed cotton acres, which represents 58.3% of total cotton acres. No-till practices were performed on a larger percentage of land formed cotton acreage (43%) with conservation tillage still practiced on 49% of land formed cotton acres (table 11).

Conclusions

Compared to the southern or national average, the Mississippi Delta has a higher percentage of no-till and conservation tillage adoption among cotton producers. Mississippi Delta cotton producers practice no-till on 27% on their total acres and 38% of their cotton acres. Beltwide, cotton producers practice no-till on 14% of their cotton acreage (table 12). Mississippi Delta cotton producers use conservation tillage practices on 51% of total acres and 48 % of cotton acres. Beltwide, cotton producers perform conservation tillage on 15% of their cotton acres. No-till and conservation tillage account for 86% of the tillage practices on cotton acres in the Mississippi Delta.

Table 1. Total Acres and Percentage of Acres Reported for Each Tillage Practice.

Total Tillage Acres Reported	No-Till Acres	Conservation Till Acres	Conventional Till Acres
240552	63919	121900	54733
Percentage of Reported Acres for each Tillage Practice	26.6	50.7	22.8

Table 2. Tillage Practice Acres for Three Farm Size Categories.

Farm Size Category (tillage acres)	Number of Reporting Farms in Each Farm Size	Average Farm Size (acres)	No-Till Acres	Conservation Till Acres	Conventional Till Acres
0-1500	35	634	5138	13433	3634
Percentage			23.1	60.5	16.4
1500-2500	20	1999	8990	20469	10520
Percentage			22.3	51.2	26.3
> 2500	46	3878	49791	87998	40579
Percentage			27.9	49.3	22.8

Table 3. Average Number of Acres per Laborer for Each Tillage Practice.

	No-Till	Conservation Tillage	Conventional Tillage
Number Acres per Laborer	159	150	132

Table 4. Total Acres and Percentage of Total Acres Reported for Each Soil Type.

Total Soil Type Acres Reported	Sandy Soils	Mixed Soils	Clay Soils
237523	89410	91440	56673
Percentage of Total Acres Reported for Each Soil Type	37.6	38.5	23.9

Table 5. Percentage of Tillage Practices Used on Each Soil Type.

Tillage Practice	Soil Type		
	Sandy Soils	Mixed Soils	Clay Soils
No-Till	37.6	27.8	38.6
Conservation Tillage	34.9	42.9	37.7
Conventional Tillage	27.4	29.3	23.6

Table 6. Total Land Formed Acres and Percentage of Land Formed Acres for Each Tillage Practice.

Total Land Formed Acres Reported	No-Till	Conservation Tillage	Conventional Tillage
120283	39516	67223	13544
Percentage	32.9	55.9	11.3

Table 7. Total Cotton Acres Reported for Each Tillage Practice.

Total Cotton Acres Reported	No-Till Acres	Conservation Till Acres	Conventional Till Acres
116449	44351	56535	15563
Percentage for each Tillage Practice	38.1	48.6	13.4

Table 8. Cotton Tillage Practice Acres and Percentage for Three Farm Size Categories.

Farm size (cotton acres only)	No-Till Acres	Conservation Tillage Acres	Conventional Tillage Acres
0-1500	1540	4565	616
Percentage	22.9	67.9	9.2
1500-2500	4821	8761	2350
Percentage	30.3	55.0	14.8
>2500	37990	43209	12597
Percentage	40.5	46.1	13.4

Table 9. Average Number of Cotton Acres per Laborer for Each Tillage Practice.

	No-Till	Conservation Tillage	Conventional Tillage
Number Acres per Laborer	202	267	145

Table 10. Total Cotton Acres Reported for Each Soil Type.

Total Soil Type Cotton Acres Reported	Sandy Soils	Mixed Soils	Clay Soils
116780	65618	40756	10406
Percentage of Total Cotton Acres	56.2	34.9	8.9

Table 11. Total Land Formed Cotton Acres and Percentage of Land Formed Cotton Acres for Each Tillage Practice.

Total Land Formed Cotton Acres Reported	No-Till	Conservation Tillage	Conventional Tillage
68137	28816	33371	5950
Percentage	42.3	49.0	8.7

Table 12. Percentage of Cotton Tillage Practices by Region and Beltwide as Reported by the CTIC.

Region	No-Till	Conservation Tillage	Conventional Tillage
South	15.5	15.9	68.7
Northeast	41.5	18.1	40.4
Mid-West	12.0	42.7	45.3
West	00.2	04.0	95.8
Beltwide	13.9	15.4	70.7

*Source: Conservation Technology Information Center. Purdue University.
http://www.ctic.purdue.edu/CTIC/CTIC.html