

**A CASE ANALYSIS OF THE COST
AND RETURNS OF A CONSERVATION
TILLAGE SYSTEM FOR COTTON PRODUCTION
IN NORTHEAST LOUISIANA**

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Abstract

This study centers around a case analysis of the direct cost per acre associated with a cotton conservation tillage demonstration in comparison with the cost associated with a conventional cotton production system. This case study was conducted on farms located in the Ouachita Valley Area of Northeast Louisiana. Data for this study covers a one year period. From this data, direct cost of production and return on investment were calculated for each tillage system.

Introduction

The use of conservation tillage systems offers the advantage of reducing fuel and equipment requirements, thus reducing the total consumption of energy. Field demonstrations such as this are commonly used to demonstrate new technology and recommend production practices.

This demonstration report is taken from data collected from cotton fields in Morehouse Parish located in Northeast Louisiana. The data collected has been used to compute direct cost of production associated with a 168 acre conservation tillage cotton field located on the Dale Herrington and Kelsey McKoin farm, and a conventional tillage cotton field located on the Jerry Stutts farm, adjacent to the demonstration field.

The soil type in these demonstration fields is alluvial. The conservation tillage field was planted using a stale seedbed production system. It has been farmed using a conservation tillage system in both 1994 and 1995. Before planting the 1994 cotton crop, the field was subsoiled and bedded with a combination subsoiling and bedding implement. Both fields have been in cotton production for several years.

The demonstration has two (2) purposes:

1. To use recommended conservation tillage practices for cotton production and recommended pest management practices for these systems throughout the growing season and view these practices under field conditions.

2. To compute and compare cost data associated with the stale seedbed conservation tillage system and a conventional tillage system.

The specific cost data allows producers to analyze production practices and associated costs and returns. It is difficult and very time consuming to compute economic data associated with all agronomic demonstrations; each production practice affects both cost and returns differently. It is important for users of information to understand the economics associated with different agronomic practices.

The conservation tillage data was collected from a 168 acre field located in Morehouse Parish near Bonita, Louisiana. The plot is operated as part of the Dale Herrington and Kelsey McKoin Farms of Morehouse Parish. The conventional tillage plot was located in a 50 acre field across a road from the conservation tillage plot. These producers have cooperated in the LSU Extension Service field demonstration program for several years. Specific data detailing each production activity was kept throughout the season for both fields.

Schedule of Production Practices

Conservation Tillage Field

The plot was planted using 6-row equipment, was irrigated and produced using a stale seedbed conservation tillage system. Production activities began in February, 1995 with stalk destruction.

Roundup D Pak was applied in late March at the rate of 20 ounces product per acre to control winter vegetation. A broadcast application of 150 pounds potassium chloride and 50 pounds ammonium sulfate per acre was applied in late April.

On May 1st the field was planted with Deltapine 20 cotton at a rate of 12 pounds per acre with a John Deere, 7100 planter. Applied Cotoran at 0.4# AI/Acre, Command at 0.4# AI/Acre, Prowl at 1.8 pints/Acre and Gramoxone at 1.0 pints/Acre. All herbicides were applied on a band. Applied Temik in-furrow at 3.5# product/Acre and PCNB liquid at 3 pints/Acre.

In mid May an application of 100 pounds of N per acre (32% liquid solution) was applied.

The field was cultivated on May 25th, June 8th, and June 26, with a MG Dickey conservation tillage cultivator. Post-emergence herbicide applications were applied on May 1st, June 8th, June 19th, and June 26th. The field was spot sprayed for Johnsongrass control with Fusilade on July 6th.

The Remainder of the pre-harvest activities centered on post-emergence applications of insecticide and irrigation. The field was flood irrigated using poly-pipe on June 28th,

early July, mid July, late July, August 18th, and August 23rd.

The cotton was defoliated on September 19th using Folex at 1 pint product per acre and Methyl Parathion at 0.25 # active ingredient per acre. This mixture was applied in a 5 gallon per acre aerial spray. On September 25th the field was sprayed with Boll 'D at 1 quart product per acre using a 5 gallon per acre aerial spray.

The field was harvested on October 6, 1995. A John Deere 2 row picker and module builder were used for the harvest operation. The per acre yield for this conservation tillage field was 878 pounds of lint.

Conventional Tillage Field

Production practices used for this field were similar to the conservation tillage field with the following exceptions.

The field was subsoiled in early March 1995, then disked one time in Mid-March, 1995.

Fertilizer was applied to the field in early April instead of late April, using different rates and materials. An additional 10 pounds of Sulphur per acre and one ton of calcitic lime per acre were applied. At this same time a 6-row hipper was used to re-establish the same rows that were used to produce the 1994 crop.

On May 3, 1995 the herbicide Treflan was applied at the rate of .5 pints per acre. The Treflan was incorporated. The field was then planted, with Stone-ville 887 cotton seed at 10 pounds per acre using a John Deere 7300 planter and similar pesticides, and rates as used in the conservation tillage field.

An application of 110 pounds of N per acre (32% liquid solution) was applied on June 5, 1995, instead of Mid-May.

Cultivations, herbicide applications, insect control, irrigations, and other field activities for the remainder of the season were fairly similar.

Two applications were made to the field for defoliation. The cotton was defoliated on September 23, 1995 using Def at the rate of .66 quarts per acre and crop oil at 1 pint per acre. A second defoliation application was applied on September 29, 1995 using Dropp and Prep.

The field was harvested on October 9, 1995. A Case IH 2044, 4-row cotton picker was used with a boll buggy and module builder. This conventional tilled field yielded 1012 pounds of lint per acre.

Cost of Production and Comparisons

Using data collected associated with sequence of operations, a per acre cost of production was estimated for

both the conservation and conventional fields. Information used to calculate cost included input prices paid and application rates used by the producer, specific performance rates and labor requirements for each individual operation, used in the production of the crops. All expense estimates for these fields are based on LSU generated budget figures and farm records.

For purpose of this report, only direct cost of production was calculated. This demonstration was specifically targeted to a particular situation and to construct fixed cost within the context of the study, the entire farm operations would have to be taken into consideration.

Summary

The conservation tillage system was successful. When compared to a conventional tillage system, expenses were significantly lower. Total direct costs for the conservation field was \$360.82 compared to \$394.73 per acre for the conventional field.

The conventional field yielded 1012 pounds of lint per acre compared to 878 pounds of lint per acre for the conservation field. Total income for the conservation field was \$456.56 per acre compared to \$526.24 per acre for the conventional field. This was an increase of 134 pounds of lint per acre or only \$69.68 per acre in total income when calculated at the loan rate of \$.52 per pound. Return on investment was \$35.77 per acre greater for the conventional field. Although the return on investment was slightly larger for the one growing season, over several years the reduction in fuel, and equipment requirement should make this tillage system very acceptable for cotton producers in Northeast Louisiana.

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TABLE 1. Comparison of direct costs per acre, cotton conservation tillage demonstration for energy reduction and conventional tillage, morehouse parish, louisiana, 1995.

<u>Expense Item</u>	<u>Conservation</u>	<u>Conventional</u>
Fertilizer/Lime	\$ 50.06	\$ 72.51
Seed	9.36	7.30
Herb, Surf, Regul.	57.15	40.40
Insecticide	106.58	121.91
Fungicide	6.38	10.80
Aerial Application	28.10	27.50
Defoliant/Boll openers	19.47	24.01
Professional Services	7.00	7.50
Labor	14.93	14.30
Diesel Fuel	23.62	25.86
Poly Tubing	3.42	3.50
Repairs (Est.)	9.58	11.50
Interest - Op. Cap. (Est.)	25.17	27.54
Total Direct Costs	\$360.82	\$394.73

TABLE 2. Comparison of yield and gross income per acre, cotton conservation tillage and conventional tillage, morehouse parish, louisiana, 1995.

	<u>Conservation</u>	<u>Conventional</u>
Yield (LB. Lint/Acre)	878	1012
Income (.52/lb.)	\$456.57	\$526.24
Yield Difference (lb.)	134	
Income Difference	\$69.68	

TABLE 3. Comparison of return on investment above direct costs per acre, conservation tillage and conventional tillage, morehouse parish, louisiana, 1995.

	<u>Conservation</u>	<u>Conventional</u>
Gross Income	\$456.56	\$526.24
Direct Cost	360.82	394.73
Return above Cost	95.74	131.51
Difference	\$35.77	