NO-TILL COTTON PRODUCTION IN MISSISSIPPI

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Abstract

An analysis of a 2000 sample of 13 no-till producers indicates that no-till cotton production may result in larger net returns per acre than conventional tillage. However, the authors caution that additional analysis based on a larger sample of commercial no-till growers on better cotton soils is needed.

Foreword

The current high cost of producing cotton and its low price, which has persisted for several years, has resulted in negative returns for many Mississippi growers. Some growers with the highest whole-farm yields have been able to maintain positive returns with conventional production practices, but their rate of return has been diminished.

This report is one in a series which examines the net returns associated with alternative systems of cotton production. It summarizes the experience of 13 Mississippi cotton growers with no-till production in 2000.

Ultra narrow row cotton (UNRC) is often grown no-till. No-till UNRC is addressed in a related report devoted exclusively to UNRC (stripper harvest). This publication is restricted to no-till cotton production based on standard row spacing and conventional or spindle harvest.

Introduction

The Department of Agricultural Economics, Mississippi State University, releases estimates of the per acre cost of producing most of the state's agricultural enterprises on an annual basis. These estimates are generally referred to as budgets. The department's standard cotton budget labeled "Solid cotton, sandy soil, 8-row equipment, Delta Area", for the 2000 season reports total direct expenses per acre of $459.33 [Parvin et al, p. 6]. Total fixed expenses per acre are estimated at $78.40. The department's estimate of total specified expenses, the sum of direct and fixed expenses, based on a yield of 825 pounds of lint per acre, is $537.73 per acre.

In general terms, Mississippi cotton growers that have shifted from conventional production practices to systems based on no-till production have been among the state's better producers, but due to the yield potential of their particular cotton soils have historically experienced lower yields. Direct comparison of their no-till yields to conventionally produced cotton yields from superior or higher yielding soils would not be appropriate. An estimate of net returns by soil type (yield potential) is the appropriate measure for comparing alternative cotton production systems.

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Methodology

During the 2000 production season, detailed information on every trip across the field was taken from commercial farming operations that employed no-till cotton production techniques on all or a significant part of their acreage. Actual yields were recorded. The information was utilized to construct per acre budget tables for each of the operations [Spurlock and Laughlin].

The Department of Agricultural Economics, Mississippi State University, standard cotton budget was employed to compare net returns above total specified expenses for the conventional or standard method of production and the no-till operations at $0.61 per pound of lint. (The price of seed is fixed at $0.05 per pound).

Study Area

Four of the cooperating farms (labeled grower 01-04) are located in the Delta region and nine (labeled grower 05-13) are located in the non-Delta or hill region of the state.

Results

A summary of selected per acre costs, yields and returns is listed in Table 1 for the 13 growers and the standard ten of the 13 growers used genetically modified seed. The standard budget reflects the cost of boll weevil eradication ($22.97 per acre). The grower no-till budgets do not.

The fertilizer cost for grower 10 is low ($3.06) because he utilized chicken litter. His budget reflects a zero cost for collecting and spreading the chicken litter. The Delta growers averaged 877 pounds of lint per acre, and the hill growers averaged 756. Insect pressure was light in 2000, but the standard budget reflects average insect pressure and a per acre cost of $91.13 for insecticide materials versus an average of $22.67 for the 13 no-till growers.

The no-till growers consistently spent more on herbicides, but less for operator labor and fuel. Net returns above specified costs were $29.46 per acre for the standard and $196.17 for the no-till growers (a difference of $166.71 per acre). When the difference in net returns is adjusted for the 2000 difference in insecticide materials ($68.46), difference in insecticide application cost ($11.53) and boll weevil eradication ($22.97); the difference in net returns per acre is $63.47 larger for no-till than the standard.

Limitations

The sample of 13 no-till growers is small and may not accurately represent the potential population of no-till growers. Mississippi cotton producers that farm the state's highest yielding cotton soils are more likely to produce profitable crops and are less likely to have shifted from conventional tillage practices. In general, Mississippi cotton producers that have shifted to no-till are farming land without the highest yield potential. A larger sample of commercial no-till cotton growers with better cotton soils will be required before the difference in no-till and conventional tillage net returns can be estimated with a reasonable degree of confidence.

Conclusions

Conventional wisdom indicates that without deep tillage cotton grown on Mississippi's sandy cotton soil will experience a yield reduction. Once the question of deep tillage is resolved, no-till and conventional tillage yields on the same soil type may not differ. No-till herbicide costs will exceed conventional tillage herbicide cost. Fertilizer and insecticide costs should be equal. No-till growers will likely utilize genetically modified seed on

a larger percentage of their acreage. Items correlated with "trips-over-the-field" such as labor, fuel, repairs, and maintenance will favor no-till. The sum of direct expenses should favor no-till. Fixed expenses will favor no-till due to smaller tractor requirements and a less expensive set of towed equipment. An analysis, which includes crop rotations, should enhance the benefits of no-till.

Literature Cited

Parvin, D.W., et al. 1999. Delta 2000 Planning Budgets. Agricultural Economics Report 106, Mississippi State University.

Spurlock, S.R. and D. H. Laughlin. 1992. "Mississippi State Budget Generator User's Guide Version 3.0. Agricultural Economics Technical Publication No. 88, Mississippi State University.

Table 1. Yield, variety type, selected cost items, and returns per acre by region, 13 no-till growers vs. standard, Mississippi, 2000.

Grower	Region	Variety	Yield	Seed	Fert.	Herb.	Insect.	Op. Labor	Fuel	Dir. Exp.	Fix. Exp.	Net Ret.
1	Delta	conv	983	9.40	38.84	43.72	22.46	13.63	5.64	174.38	57.62	443.81
2		Bt	944	10.71	18.38	41.40	12.61	15.32	6.41	360.20	58.10	230.70
3		RR	805	10.00	34.60	29.92	38.40	7.37	4.01	116.74	39.96	396.74
4		conv	775	9.40	8.89	91.88	36.15	18.94	8.87	258.00	64.61	210.20
Average			877	9.88	25.18	51.73	27.41	13.82	6.23	227.33	55.07	320.36
Standard		conv	825	9.40	36.96	35.27	91.13	17.07	9.79	459.33	78.40	29.46
5	Hills	BtRR	675	9.00	37.84	27.84	35.91	11.50	4.12	393.73	54.99	15.34
6		BtRR	649	14.76	10.97	39.94	18.69	11.56	6.12	286.20	56.84	109.10
7		BtRR	688	11.68	20.33	21.86	5.15	10.56	5.06	226.62	52.83	199.85
8		BtRR	875	11.07	24.73	57.71	8.34	16.21	5.69	351.14	69.11	189.33
9		BtRR	760	13.53	41.62	95.44	32.63	13.24	6.86	390.25	62.69	76.54
10		BtRR	790	9.84	3.06	41.70	5.49	12.47	7.22	313.10	59.92	177.39
11		conv	1045	12.22	30.61	59.17	24.15	15.75	8.83	348.15	85.65	294.25
12		BtRR	810	12.30	38.82	41.88	18.45	13.22	5.79	313.35	61.30	189.69
13		BtRR	515	14.14	36.52	64.85	36.29	10.93	5.46	285.72	55.74	17.32
Average			756	12.06	27.17	50.04	20.57	12.83	6.13	323.14	62.12	140.98
Combined Average			793	11.39	26.55	50.56	22.67	13.13	6.16	293.66	59.95	196.17