



ECONOMIC ANALYSIS OF ULTRA-NARROW-ROW COTTON

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RESEARCH PROBLEM

Ultra-narrow-row cotton production continues to be of interest to Arkansas growers. Several producers are growing sizeable acreages. Some are investing in harvesting and spraying equipment with prolonged ultra-narrow-row cotton production in mind. Most of these farmers are producing ultra-narrow-row cotton under dryland conditions on marginal ground that cannot support conventional cotton and where soybean yields are low.

BACKGROUND INFORMATION

Ultra-narrow-row cotton is defined as “cotton planted in 10-inch (0.254 m) rows or narrower with approximately two plants per foot (6.56 plants m⁻¹) (120,000 plants ac⁻¹; 296,400 plants ha⁻¹)” (Perkins, 1998). It is often planted with a grain drill and harvested with a cotton stripper using a finger-type header. The ultra-narrow-row system of cotton production has been purported to have a lower cost of production and an earlier maturity date than conventional cotton.

METHODS

This study consisted of a replicated experiment and cost and return analysis of the data it generated. The experiment consisted of three treatments replicated four times. The treatments were ultra-narrow-row cotton, conventional cotton, and soybeans. Each was produced using best management practices. All treatments were non-irrigated. A field located at the Cotton Branch Experiment Station in Marianna, Arkansas, was selected for the test. The Cotton Branch Station was chosen because of its

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close proximity to many ultra-narrow-row cotton producers in the state, and because the Station Director has experience with this cotton production system. The field was chosen because of its marginal quality. Much of the soil at the Cotton Branch Experiment Station is good-quality cotton soil. This field, however, contains mixed soil types not as suited to conventional cotton production. Our hypothesis was that ultra-narrow-row cotton will produce greater net returns than conventional cotton or soybeans on non-irrigated fields with marginal soil types.

Accurate field records were kept throughout the season. The field plots were 38 feet by 500 feet in size. The middle 12.67 feet (the equivalent of 4 rows) were harvested from each plot. The soybeans were harvested using a plot combine equipped with a weigh scale. The cotton treatments were harvested with commercial 4-row harvesters and the basket dumped into a boll buggy equipped with scales. The remainder of each cotton plot was then harvested and the seedcotton from all four replications, and all 38 feet in each replication, was ginned at the local commercial gin. The gin provided turnout, grade, and loan value information for ultra-narrow-row cotton and conventional cotton.

Returns, costs, and net returns were estimated using the Mississippi State Budget Generator (Laughlin and Spurlock, 2000). Loan values were obtained from the gin report and used to value cotton production. The loan rate of \$5.40 per bushel was used to value soybean production. Input prices were obtained from the University of Arkansas 2001 enterprise budgets (Bryant and Windham, 2001).

RESULTS

Crop yields are displayed in Table 1. Thirty bushels per acre for non-irrigated soybeans is a good yield. On a seedcotton basis, the conventional cotton out-yielded the ultra-narrow-row cotton by 33%. However, the gin reported a 37.93% turnout for the ultra-narrow-row cotton, and only a 28.84% turnout for the conventional cotton. This is contrary to what one would normally expect. The ultra-narrow-row cotton was harvested with a cotton stripper that had a bur extractor on board. Perhaps that lint cleaning was sufficient to give the ultra-narrow-row cotton an advantage on turnout when it reached the gin. A local cotton producer indicated that the same thing occurred with his ultra-narrow-row cotton in 2001.

Information on cotton grade and value is displayed in Table 2. One bale of ultra-narrow-row cotton had a loan value greater than both of the conventional cotton bales, while the other ultra-narrow-row bale had a loan value considerably less than the conventional cotton bales. This was the result of high micronaire. The loan values averaged across the two bales for each treatment are 51 cents per pound for ultra-narrow-row cotton and 48.92 cents per pound for conventional cotton. The cotton weights presented in Table 2 are for the entire plots of all four replications. All four replications combined comprise approximately 1.75 acres under each treatment. Therefore, these weights translate to yields of 607 lb/acre for the ultra-narrow-row cotton and 524 lb/acre for the conventional cotton.

Estimated costs and returns for ultra-narrow-row cotton, conventional cotton, and soybeans are displayed in Tables 3, 4, and 5, respectively. The two cotton treatments resulted in approximately the same net returns. The soybean treatment resulted in net returns approximately \$70/acre greater than the two cotton treatments.

PRACTICAL APPLICATION

The year 2001 was a good year for non-irrigated soybeans in this study. This soybean crop was inexpensive to grow and had a very good yield. The ultra-narrow-row cotton had less seedcotton per acre than the conventional cotton, but surprisingly it had a much higher turnout, resulting in similar lint yields between the two treatments. Total specified expenses were also similar between the two cotton treatments. The ultra-narrow row treatment had total specified expenses of \$20/acre less than the conventional cotton treatment.

The use of a growth regulator on the ultra-narrow-row cotton in 2001 may have been excessive thereby increasing costs and reducing yield. However, this is also a reflection of the uncertainty involved in ultra-narrow-row cotton production. The growth regulator was applied in anticipation of future rains that did not materialize.

REFERENCES

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Table 1. Yield for ultra-narrow-row cotton, conventional cotton, and soybeans.

	Ultra-narrow-row cotton		Conventional cotton		Soybeans	
	Seedcotton	Lint ^z	Seedcotton	Lint ^y	Yield	
	(lb/acre)	(lb/acre)	(lb/acre)	(lb/acre)	(lb/acre)	(bu/acre)
Rep 1	1389.33	526.97	1946.44	561.35	1131.99	21.69
Rep 2	1293.04	490.45	1746.99	503.83	1279.50	24.51
Rep 3	2049.61	777.42	2414.14	696.24	1860.60	35.64
Rep 4	1471.87	558.28	2166.54	624.83	1902.69	36.45
Average	1550.97	588.28	2068.53	596.56		29.57

^z Based on a 37.93% turnout as reported by the cotton gin.

^y Based on a 28.84% turnout as reported by the cotton gin.

Table 2. Cotton grade information, bale weights, and bale value; ultra-narrow-row cotton and conventional cotton.

Bale number	Net weight ^z	Grade	Leaf	Staple length	Micronaire	Loan value ^y	
	(lb)			(in.)		(\$/bale)	(cents/lb)
Ultra-narrow-row cotton							
1	501	31	4	34	4.4	264.38	52.77
2	561	42	4	33	5.3	224.51	40.02
Conventional cotton							
1	460	32	3	33	4.5	221.81	48.22
2	457	31	3	33	4.5	226.76	49.62

^z The entire plots, including the samples harvested for the yield data, were harvested and ginned together. This resulted in two bales of cotton from each of the cotton systems.

^y Loan value from gin reports.

**Table 3. Estimated costs and returns per acre,
Cotton Branch Experiment Station, Marianna, AR, 2001.**

Item	UNRC	Conventional cotton	Soybean
	----- (\$/acre) -----		
Total income			
ultra-narrow-row cotton	300.02 ^z		
conventional cotton		291.84 ^y	
soybean			162.00 ^x
Direct expenses			
Crop seed	45.20	11.30	25.00
Custom work	8.00	8.00	4.50
Fertilizer and lime	32.11	28.24	14.82
Growth regulators	20.50	8.20	
Harvest aids	18.37	18.37	
Herbicides	19.05	18.14	9.76
Insecticides	35.41	35.41	
Technology fee	38.00	38.00	
Operator labor	15.97	14.17	5.01
Diesel fuel	14.12	15.85	5.99
Repair and maintenance	18.77	31.68	8.36
Interest on operating capital	15.19	11.60	4.66
Total direct expenses	280.76	239.09	78.16
Returns above direct expenses	19.26	52.75	83.83
Total fixed expenses	39.80	61.55	21.57
Total specified expenses	320.56	300.64	100.04
Returns above total specified expenses	-20.54	-8.80	61.95

^z Using a price of \$0.51/lb for 588.28 lb cotton per plot.

^y Using a price of \$0.4892/lb for 596.56 lb cotton per plot.

^x Using a price of \$5.40/bu for 30 bu soybean per plot.