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# Production Costs and Returns for Tobacco in 2002

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## Abstract

Both the gross value and the cash costs per acre for tobacco were lower in 2002 than in 2001, with the gross value of production falling more than the decline in cash costs. Consequently, net returns per acre were lower for burley and flue-cured tobacco. Lower gross production value was due primarily to yield losses caused by drought and disease in 2002. Cost estimates are computed using production data from the last tobacco surveys conducted in 1995 for burley tobacco and 1996 for flue-cured tobacco, and 2002 data on prices, yields, marketing costs, and quota levels.

**Keywords:** Tobacco, burley, flue-cured, cost of production, net returns, cost factors.

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## Introduction

Burley and flue-cured tobacco are the two major types of tobacco produced in the United States. Burley tobacco is primarily grown in Kentucky and Tennessee, while flue-cured tobacco is primarily grown in North Carolina, South Carolina, Georgia, and Virginia, with over half of the crop raised in North Carolina. USDA sets domestic quota levels to meet projected annual domestic and export demand while maintaining prices above the support level. In recent years, falling domestic and export demand resulted in lower quotas. The effective quotas for burley tobacco dropped to 349 million pounds in 2002 from 720 million pounds in 1996 while harvested acres fell to 158,700 in 2002 from 268,300 in 1996.<sup>1</sup> The effective quota for flue-cured tobacco fell to 545 million pounds in 2002 from 944 million pounds in 1996 and harvested area dropped to 245,600 acres in 2002 from 422,200 in 1996.

Effective quotas in 2002 were essentially unchanged from the 2001 tobacco season. However, in 2002, tobacco suffered from poor crop conditions that reduced yields and lowered tobacco quality. Prices remained stable in 2002 from the 2001 marketing period. Harvested acres of burley tobacco declined 3 percent from 2001 while production declined 11 percent. Harvested acres of flue-cured tobacco rose 3 percent in 2002 from 2001 but total production declined 11 percent as yields declined.

<sup>1</sup>The effective quota is the amount of tobacco that producers can market through all means, including auctions and contracts.

## Burley Tobacco: Costs and Returns

The gross value of burley tobacco production less cash expenses averaged \$2,167 per acre in 2002, down \$244 from 2001, but above the 1997-2001 average of \$2,121 per acre (table 1). Residual returns to management and risk—defined as the gross value of production minus total economic cost—was \$249 per acre in 2002, down from \$427 in 2001 and less than half the average return of \$530 for the previous 5 years. Net returns declined in 2002 because the drop in gross value of production was more than the drop in cash expenses and total economic costs per acre.

The gross value of burley tobacco was \$3,777 per acre in 2002, \$317 less than in 2001 but near the average value of \$3,760 for 1997-2001. The drop in value per acre resulted from decreased yields, as prices remained steady. Unfavorable growing conditions pushed the average yield to 1,912 pounds per acre in 2002, down 166 pounds from 2001 (a year with high yields). National yields averaged 1,951 pounds per acre in the previous 5 years. Kentucky's burley tobacco yields averaged 1,915 pounds per acre in 2002, down 185 pounds from 2001. Tennessee tobacco suffered a smaller decline of 100 pounds per acre from 2001, with yields averaging 1,900 pounds in 2002. The lower yields resulted from heavy spring rains that were followed by drought in the last portion of the growing season.

Burley tobacco prices averaged \$1.98 per pound in 2002, about the same as in 2001 (table 1). Auction prices averaged \$1.95 per pound, while contract prices averaged \$1.99 per pound in 2002. The share of burley tobacco sold under a marketing contract rose from 66 percent in 2001 to 73 percent in 2002. Price support for the 2002 crop was set at \$1.84 per pound, compared with \$1.83 in 2001.

Cash operating expenses averaged \$1,610 per acre in 2002, down \$73 from 2001. Lower energy prices, interest rates, and yields are the chief reasons for lower production expenditures per acre. By the spring of 2002, natural gas prices had fallen sharply from the elevated levels a year earlier. Since natural gas is the primary input in fertilizer production, the reduction in natural gas prices contributed to a \$62 decline in fertilizer expenditures. Marketing expenditures per acre declined due to lower yields and an increase in the percentage of burley tobacco marketed under contract. Some of this savings was offset by changes in the rules for grading tobacco. In 2001, tobacco producers with marketing contracts did not pay warehouse or grading fees. Starting with the 2002 crop, all burley tobacco must be graded by Federal graders with the cost borne by tobacco producers. Reductions in short-term interest rates and lower variable cash expenditures per acre reduced interest costs by \$9 per acre in 2002. The only significant increase in expenditures was for hired labor as higher wage rates boosted these expenditures by \$6 per acre.

Economic costs were \$3,528 per acre in 2002, down \$139 from 2001 (table 1). In addition to cash expenses, economic costs include the cost for capital replacement and the opportunity cost for land, quota, unpaid labor, and operating and other nonland capital. Opportunity costs per acre were less for tobacco quota and operating capital in 2002 than 2001. The opportunity cost

of quota per acre was less because tobacco yields decreased while quota lease rates remained stable.<sup>2</sup> Lease rates were stable because of fairly steady effective quota levels between 2001 and 2002. The opportunity costs for operating capital were lower as both interest rates and cash costs were lower in 2002 than 2001.

<sup>2</sup> Production costs are allocated to the year in which the production occurred. Tobacco producers producing more than 103 percent of their allotted tobacco quota can store tobacco until the following year. Storing tobacco gives them the option of (1) renting sufficient quota next spring to allow them to sell that tobacco in the fall or (2) reducing the amount of tobacco they plant in the spring so that their quota is sufficient to cover the tobacco carried over from the previous year while also covering the current-year production. In the cost-of-production accounts, the cost of quota rental is charged in the production year using the quota rental rate during the production year.

## Flue-Cured Tobacco: Costs and Returns

Net cash returns to flue-cured tobacco—gross production value less total cash expenses—declined to \$1,385 per acre in 2002, versus \$2,009 in 2001 and an average annual return of \$1,724 per acre from 1997 to 2001 (table 2). The gross value of production fell by \$682 to \$3,836 per acre as prices and yields of flue-cured tobacco decreased. Cash expenses declined by \$59 per acre, to \$2,450 in 2002. Economic costs fell \$215 per acre to \$4,235. The residual return to management and risk turned negative in 2002, at -\$399. In 2001, the residual return was \$68 per acre, but in 1999 and 2000 the residual return was negative. The main cause for low returns in 2002 was low yields caused by drought and disease.

The gross value per acre of flue-cured tobacco fell to \$3,836 per acre in 2002 as yields and prices declined. In 2001, the gross value per acre was a record-high \$4,518 (table 2). From 1997 to 2002, the gross value of production averaged \$4,063 per acre. Unusually bad weather in 2002 decreased tobacco quality and dropped the average yield to 2,096 pounds from 2,429 pounds in 2001 (and from a 5-year average of 2,290 pounds). South Carolina flue-cured tobacco growers saw the largest drop in yield, while Virginia growers suffered only a slight decrease. In North Carolina, where 76 percent of U.S. flue-cured tobacco was produced in 2002, growers faced yield declines of 14 percent. Prices averaged \$1.83 per pound in 2002, down from \$1.86 per pound in 2001. The lower average price may have resulted from lower tobacco quality due to the 2002 drought and high incidence of tobacco diseases. Prices for producers with marketing contracts averaged \$1.84 per pound for the season, while auctioned tobacco averaged \$1.76 in 2002. Marketing contracts covered 81 percent of the 2002 flue-cured tobacco, about the same percentage as the previous year.

Cash expenses totaled \$2,450 per acre in 2002, down from 2001, but up from the 1997-2001 average of \$2,338. Lower energy prices, lower interest rates, and reduced yields were the major factors driving the dip in cash expenses. Lower natural gas and diesel prices in the spring of 2002 reduced fertilizer costs by \$36 per acre and fuel costs by \$10 per acre. Costs for curing fuel fell by \$41 per acre as lower yields reduced the amount of fuel needed to cure the tobacco produced on an acre. Fuel prices rose by 5 percent between the late summer and early fall months in 2001 and 2002 when producers usually purchase their curing fuel. These price increases for curing fuel offset some of the reduction in curing fuel costs per acre caused by lower yields.

Lower interest rates as well as lower input costs per acre lowered the interest paid by \$20 per acre. Marketing expenditures per acre rose to \$92, up from \$89 per acre in 2001 in spite of the yield decline. Starting in 2002, tobacco producers, including those with marketing contracts, must pay to have their flue-cured and burley tobacco graded by Federal graders. (In 2001, tobacco companies obtaining tobacco under marketing contracts paid for their own graders to grade tobacco.) Increases in agricultural wage rates boosted hired labor expenditures by \$35 per acre.

The economic costs of producing flue-cured tobacco fell to \$4,235 per acre in 2002, down from \$4,449 in 2001 but higher than the 1997-2001 average of \$3,976. The decline in cash expenses per acre, along with the \$188 decline in the opportunity cost of quota per acre, lowered the economic cost of production. Lower quota costs per acre were brought about by the reduced tobacco yield (see footnote 2). Quota lease rates remained stable since the effective quota did not vary much between 2001 and 2002. The opportunity cost of unpaid labor rose \$14 per acre and the replacement cost for machinery rose by \$15 per acre, offsetting some of the declines in cash costs and the opportunity cost of quota. The opportunity costs for unpaid labor rose as agricultural wage rates increased. Prices paid for farm machinery rose 6 percent in 2002, boosting capital replacement costs.

## Data and Methods

Most data used to compute costs of production are derived from the Agricultural Resource Management Survey (ARMS) for 1996 and later years, and from the Farm Costs and Returns Survey (FCRS) prior to 1996. Multiple versions of the survey are conducted each year. One version of the annual ARMS survey is used to collect data for the entire farm operation, while one or more additional versions are used to collect commodity-specific data.<sup>3</sup> Data on a specific commodity are collected on a rotating basis every 3 to 12 years. Agricultural commodities included in the survey program are corn, soybeans, wheat, cotton, grain sorghum, rice, peanuts, oats, barley, sugarbeets, burley tobacco, flue-cured tobacco, dairy, hogs, and cow-calf.

Data from the 1995 FCRS provide the base for the burley tobacco cost of production estimates since the 1995 FCRS was the last survey to collect burley tobacco production and cost information. The information was collected from personal interviews with 131 Kentucky farmers and 104 Tennessee farmers. The 1996 tobacco version of the ARMS collected data on the cost of production for flue-cured tobacco from 316 flue-cured tobacco producers in Virginia, North Carolina, South Carolina, and Georgia.

Cost-of-production estimates after the survey year are computed by adjusting survey year estimates by an index of current-year to survey-year input prices and, in some cases, adjusting for yield changes. This procedure holds production input and technology levels constant for post-survey years. Hence, cost-of-production estimates are generally most accurate for the survey year since these estimates reflect the actual level of technology and the size of farm enterprises at that time. The accuracy of the cost estimates for post-survey years depends on changes in production practices, enterprise size, and technology since the last survey.

Significant changes in burley and flue-cured tobacco production have occurred since the last tobacco surveys were conducted. Some of these changes include quota reductions and increased use of marketing contracts. The effective quota for flue-cured tobacco dropped 42 percent since the 1996 survey was conducted, while the burley tobacco quota dropped 40 percent since 1995. In 2002, marketing contracts accounted for 73 percent of burley tobacco and 81 percent of flue-cured tobacco sold in the U.S. In addition, heat exchangers are now used in drying flue-cured tobacco and larger bales are used for marketing.

Data for computing the annual updates come from a variety of sources, mostly from the National Agricultural Statistics Service (NASS), USDA. NASS reports annual and sometimes monthly estimates of quantities and prices for a variety of farm input items. NASS also provides State-level figures for harvested tobacco acreage, yields, and production as well as information on the average cash rents for farmland. USDA's Agricultural Marketing Service provides data for updating marketing costs, tobacco prices, and shares of contract and auctioned tobacco. The quota rental rate is estimated based on historical relationships between quota cash rents and the effective quota for burley tobacco. This historical relationship is applied to the effective quota in the current year to estimate cash rent.

<sup>3</sup> For more information on ARMS, please visit the ARMS briefing room, [www.ers.usda.gov/briefing/ARMS](http://www.ers.usda.gov/briefing/ARMS).

**Table 1—U.S. burley tobacco costs and returns, 1996-2002**

Item	Dollars per acre							Dollars per cwt						
	1996	1997	1998	1999	2000	2001	2002	1996	1997	1998	1999	2000	2001	2002
Gross value of production	3,774.72	3,662.82	3,629.00	3,471.30	3,941.97	4,093.66	3,776.98	192.04	189.00	190.40	189.87	196.55	197.46	197.54
Cash expenses:														
Seed and plant bed	103.80	100.04	100.04	98.33	102.61	106.03	106.89	5.28	5.16	5.24	5.38	5.13	5.10	5.59
Fertilizer	305.84	296.94	296.88	290.96	288.81	338.12	276.46	15.56	15.32	15.54	15.93	14.43	16.27	14.46
Chemicals	97.83	98.65	100.29	99.47	98.65	98.65	97.83	4.98	5.09	5.25	5.44	4.93	4.75	5.12
Custom operations	12.90	14.48	13.58	13.35	13.35	13.57	13.46	0.66	0.75	0.71	0.73	0.67	0.65	0.70
Fuel, lube, and electricity	73.35	77.66	63.28	66.88	96.36	87.01	76.22	3.73	4.01	3.31	3.66	4.82	4.19	3.99
Repairs	70.41	72.25	72.86	74.08	75.92	78.37	80.21	3.58	3.73	3.81	4.05	3.79	3.77	4.20
Hired labor	421.80	432.59	455.40	497.01	499.76	527.29	533.45	21.46	22.32	23.84	27.20	24.98	25.37	27.90
Marketing expenses	139.20	128.69	165.02	161.32	152.65	64.42	59.89	7.08	6.64	8.64	8.83	7.63	3.10	3.13
Other variable cash expenses	18.10	18.58	20.58	19.88	20.78	21.50	21.32	0.92	0.96	1.08	1.09	1.04	1.03	1.12
Total, variable cash expenses	1,243.23	1,239.88	1,287.93	1,321.28	1,348.89	1,334.96	1,265.73	63.24	63.98	67.42	72.31	67.42	64.23	66.21
General farm overhead	163.48	210.40	202.86	206.27	211.38	218.20	223.31	8.32	10.86	10.62	11.29	10.56	10.50	11.68
Taxes and insurance	40.13	44.22	44.88	45.45	46.19	47.18	47.63	2.04	2.28	2.35	2.49	2.31	2.27	2.49
Interest	64.50	71.22	76.68	74.57	78.79	82.31	73.16	3.28	3.67	4.01	4.08	3.94	3.96	3.83
Total, fixed cash expenses	268.11	325.84	324.42	326.29	336.36	347.69	344.10	13.64	16.81	16.99	17.86	16.81	16.73	18.00
Total, cash expenses	1,511.34	1,565.72	1,612.35	1,647.57	1,685.25	1,682.65	1,609.83	76.87	80.79	84.42	90.17	84.23	80.96	84.21
Gross value of prod. less cash expenses	2,263.38	2,097.10	2,016.65	1,823.73	2,256.72	2,411.01	2,167.15	115.13	108.21	105.99	99.70	112.32	116.51	113.33
Economic (full ownership) costs:														
Variable cash expenses	1,243.23	1,239.88	1,287.93	1,321.28	1,348.89	1,334.96	1,265.73	63.24	63.98	67.42	72.31	67.42	64.23	66.21
General farm overhead	163.48	210.40	202.86	206.27	211.38	218.20	223.31	8.32	10.86	10.62	11.29	10.56	10.50	11.68
Taxes and insurance	40.13	44.22	44.88	45.45	46.19	47.18	47.63	2.04	2.28	2.35	2.49	2.31	2.27	2.49
Capital replacement	91.07	97.25	100.27	104.27	134.13	142.02	153.02	4.63	5.02	5.25	5.71	6.70	6.83	8.00
Operating capital	31.64	32.11	31.23	31.45	40.91	23.02	10.70	1.61	1.66	1.64	1.72	2.04	1.11	0.56
Other nonland capital	104.28	113.12	104.87	102.80	94.08	88.16	89.09	5.31	5.84	5.49	5.63	4.70	4.24	4.66
Land and quota	751.25	512.67	531.74	633.44	991.31	1,081.99	998.22	38.22	26.45	27.84	34.67	49.54	52.07	52.21
Unpaid labor	585.19	600.16	631.80	689.53	693.35	731.03	740.09	29.77	30.97	33.08	37.74	34.65	35.18	38.71
Total, economic (full ownership) costs	3,010.27	2,849.81	2,935.58	3,134.49	3,560.24	3,666.56	3,527.79	153.12	147.05	153.70	171.56	177.92	176.45	184.52
Residual returns to management and risk	764.45	813.01	693.42	336.81	381.73	427.10	249.19	38.88	41.95	36.70	18.31	18.63	21.01	13.02
Price (dollars/lb and cwt)	1.92	1.89	1.90	1.90	1.97	1.97	1.98	192.16	189.00	190.40	189.87	196.55	197.46	197.54
Yield (lb and cwt/acre)	1,966	1,938	1,910	1,827	2,001	2,078	1,912	19.66	19.38	19.10	18.27	20.01	20.78	19.12

Source: Estimates were developed from the 1995 Farm Costs and Returns Survey and updated with current price indices (see box, "Data and Methods").



**Table 2—U.S. flue-cured tobacco costs and returns, 1996-2002**

Item	1996	1997	1998	1999	2000	2001	2002	1996	1997	1998	1999	2000	2001	2002
	Dollars per acre							Dollars per cwt						
Gross value of production	3,941.28	3,921.60	3,846.50	3,744.48	4,283.47	4,517.94	3,835.68	183.70	172.00	175.36	173.70	179.30	185.70	182.50
Cash expenses:														
Seed and plant bed	55.71	57.65	59.10	63.46	60.07	63.95	68.79	2.60	2.53	2.69	2.95	2.51	2.63	3.28
Fertilizer	282.59	290.73	304.39	282.66	273.93	320.04	284.21	13.19	12.75	13.85	13.13	11.45	13.18	13.56
Chemicals	216.56	218.38	220.18	218.38	216.58	216.58	214.78	10.11	9.58	10.02	10.15	9.05	8.92	10.25
Custom operations	9.07	9.88	8.00	7.86	7.79	7.92	7.85	0.42	0.43	0.36	0.37	0.33	0.33	0.37
Fuel, tube, and electricity	67.75	71.74	59.56	62.94	90.69	81.89	71.74	3.16	3.15	2.71	2.92	3.79	3.37	3.42
Curing fuel	272.91	301.50	258.98	325.72	477.38	446.30	405.27	12.74	13.22	11.78	15.14	19.95	18.37	19.34
Repairs	106.95	109.74	110.67	112.53	115.32	119.04	121.83	4.99	4.81	5.04	5.23	4.82	4.90	5.81
Hired labor	468.02	491.96	554.12	582.09	594.35	634.61	669.52	21.85	21.58	25.21	27.05	24.84	26.13	31.94
Marketing expenses	143.42	151.39	145.95	160.76	187.24	88.95	92.42	6.70	6.64	6.64	7.47	7.82	3.66	4.41
Other variable cash exp.	3.91	4.01	3.88	3.81	3.98	4.12	4.09	0.18	0.18	0.18	0.18	0.17	0.17	0.20
Total, variable cash expenses	1,626.89	1,706.98	1,724.83	1,820.21	2,027.33	1,983.40	1,940.50	75.94	74.87	78.47	84.59	84.73	81.66	92.58
General farm overhead	116.32	149.71	181.75	184.80	189.38	195.49	200.07	5.43	6.57	8.27	8.59	7.91	8.05	9.55
Taxes and insurance	111.78	122.91	140.61	141.26	142.27	148.49	148.27	5.22	5.39	6.40	6.56	5.95	6.11	7.07
Interest	129.03	142.47	169.37	164.71	174.03	181.80	161.60	6.02	6.25	7.71	7.65	7.27	7.48	7.71
Total, fixed cash exp.	357.13	415.09	491.73	490.77	505.68	525.78	509.94	16.67	18.21	22.38	22.80	21.13	21.64	24.33
Total, cash expenses	1,984.02	2,122.07	2,216.56	2,310.98	2,533.01	2,509.18	2,450.44	92.61	93.08	100.85	107.39	105.86	103.30	116.91
Gross value of prod. less cash expenses	1,957.26	1,799.53	1,629.94	1,433.50	1,750.46	2,008.76	1,385.24	91.09	78.92	74.51	66.31	73.44	82.40	65.59
Economic (full ownership) costs:														
Variable cash expenses	1,626.89	1,706.98	1,724.83	1,820.21	2,027.33	1,983.40	1,940.50	75.94	74.87	78.47	84.59	84.73	81.66	92.58
General farm overhead	116.32	149.71	181.75	184.80	189.38	195.49	200.07	5.43	6.57	8.27	8.59	7.91	8.05	9.55
Taxes and insurance	111.78	122.91	140.61	141.26	142.27	148.49	148.27	5.22	5.39	6.40	6.56	5.95	6.11	7.07
Capital replacement	255.67	273.03	283.70	295.02	313.34	320.86	336.10	11.94	11.98	12.91	13.71	13.09	13.21	16.04
Operating capital	41.60	44.21	41.83	43.32	59.30	33.72	15.72	1.94	1.94	1.90	2.01	2.48	1.39	0.75
Other nonland capital	77.81	84.40	80.10	79.19	77.52	76.83	77.64	3.63	3.70	3.64	3.68	3.24	3.16	3.70
Land and quota	853.63	843.73	974.05	1,131.93	1,370.37	1,433.20	1,244.92	39.85	37.01	44.32	52.60	57.27	59.00	59.40
Unpaid labor	189.91	199.62	224.84	236.19	241.16	257.49	271.65	8.87	8.76	10.23	10.98	10.08	10.60	12.96
Total, economic (full ownership) costs	3,273.61	3,424.59	3,651.71	3,931.92	4,420.67	4,449.48	4,234.87	152.82	150.22	166.15	182.72	184.75	183.18	202.05
Residual returns to management and risk	667.67	497.01	194.79	-187.44	-137.20	68.46	-399.19	30.88	21.78	9.21	-9.02	-5.45	2.52	-19.55
Price (dollars/lb and cwt)	1.84	1.72	1.75	1.74	1.79	1.86	1.83	183.70	172.00	175.36	173.70	179.30	185.70	182.50
Yield (lb and cwt/acre)	2,142	2,280	2,198	2,152	2,393	2,429	2,096	21.42	22.80	21.98	21.52	23.93	24.29	20.96

Source: Estimates were developed from the 1996 Agricultural Resource Management Survey (ARMS) and updated with current price indices (see box, "Data and Methods").