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Production Costs and Returns for Tobacco in 2003

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Abstract

Average net returns per acre were estimated to be negative for burley and flue-cured tobacco in 2003. Total economic costs for burley and flue-cured tobacco production likely rose in 2003 from the previous year due to higher costs for energy, labor, and quota rent. 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 2003 data on prices, yields, marketing costs, and quota levels.

Keywords: tobacco, burley, flue-cured, cost of production, net returns, and quota.

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Introduction

Burley and flue-cured are the two major types of tobacco produced in the United States. Burley tobacco is primarily grown in Kentucky and Tennessee and flue-cured in North Carolina, South Carolina, Georgia, and Virginia, with over half of the crop raised in North Carolina. Prior to the 2005 crop year, the U. S. Department of Agriculture (USDA) set the domestic quota level for burley and flue-cured tobacco to meet the projected annual domestic and export demand while maintaining prices above the support level.¹ In recent years, falling domestic and export demand resulted in lower quotas. The effective quotas for burley tobacco dropped to 320 million pounds in 2003 from 720 million pounds in 1996, while harvested acres fell to 152,300 in 2003 from 268,300 in 1996.² The effective quota for flue-cured tobacco fell to 540 million pounds in 2003 from 944 million pounds in 1996, and harvested area dropped to 233,400 acres in 2003 from 422,200 acres in 1996.

Residual returns to management and risk for burley and flue-cured tobacco production were both estimated to be negative on average in 2003.³ Residual returns are the returns from production after all costs, including the cash and opportunity costs for land, quota, labor, and machinery, are subtracted from the value of production. Residual returns from burley tobacco production fell to an estimated -\$10 per acre in 2003 from \$249 per acre in 2002 because the gross value of production remained fairly steady while total economic costs rose. Average burley prices remained steady in the 2002 and 2003 marketing seasons, while yields increased slightly. Total costs per acre for burley production rose due to higher prices for energy, labor, and quota rental. Residual returns per acre from flue-cured tobacco production, an estimated -\$755 per acre in 2003, were lower than in the previous year as the gross production value fell and total economic costs rose. A higher average price per pound did not fully offset lower yields in 2003. As with burley, the total economic costs per acre for flue-cured tobacco rose due to higher prices for energy, labor, and quota rental.

¹The Fair and Equitable Tobacco Reform Act of 2004, also known as the Tobacco Program Buyout, terminates price supports and marketing quotas for flue-cured and burley tobacco beginning with the 2005 crop.

²The effective quota is the amount of tobacco that producers were permitted to market through all means, including auctions and contracts.

³Burley tobacco costs of production are based on the production costs in two States, Kentucky and Tennessee. The costs for flue-cured tobacco are based on the costs in four States, Virginia, North Carolina, South Carolina, and Georgia.

Burley Tobacco: Costs and Returns for 2003

The residual returns to management and risk from burley tobacco production turned negative in 2003 to -\$10 per acre, down from \$249 per acre in 2002 as an increase in total economic cost per acre exceeded the small increase in the gross value per acre. In comparison, the residual returns to management and risk averaged \$418 per acre from 1998 to 2002. The residual return to management and risk is the return after accounting for cash costs, farm machinery and building replacement, and the opportunity cost of land, quota, unpaid labor, and capital. The gross value of production less cash expenses declined to an estimated \$2,062 per acre in 2003, down from \$2,167 in 2002, and down from a 5-year average of \$2,135 from 1998 to 2002.

The gross value of burley tobacco production in 2003 totaled \$3,801 per acre, compared with \$3,777 per acre in 2002, as yields and prices remained steady. Burley tobacco yields averaged 1,920 pounds per acre in 2003, about the same as the drought-reduced level of 1,912 pounds in 2002. Kentucky tobacco farmers produced an average of 1,925 pounds per acre of burley tobacco in 2003, an increase of 10 pounds from 2002. Yields may have been reduced in 2003 by delays in transplanting caused by the wet spring and localized blue mold damage. Burley tobacco prices were stable between 2002 and 2003 at \$1.98 per pound. Prices received by producers with tobacco marketing contracts averaged \$1.99 per pound in 2003, while producers auctioning their tobacco received \$1.96 per pound.

Total cash expenses per acre rose to \$1,739, up \$129 per acre from 2002. Total economic costs increased \$283 from the previous year to reach \$3,811 per acre in 2003. Increased costs of energy, labor, and quota raised the cash expenses per acre, overwhelming the effects from lower interest rates. For example, diesel prices rose 41 percent from April 2002 to April 2003, nitrogen prices in Kentucky rose sharply from 20.7 cents per pound in 2002 to 29.3 cents per pound in 2003, and hired labor costs per acre rose in 2003 because of increased wages. In Kentucky, the average hourly rate for field workers was \$7.37 per hour in 2003, compared with \$6.76 in 2002. Quota rental costs per pound for burley tobacco rose about 10 percent from 2002 to 2003, primarily due to the 8-percent drop in the effective burley tobacco quota.⁴ The increased rental rate was the chief reason for the rise in the opportunity costs of land and quota per acre. Declines in interest rates lowered the opportunity costs for nonland capital. Marketing expenditures declined slightly due to the increased percentage of tobacco marketed through contracts, since producers with marketing contracts do not pay warehouse fees. In 2003, 76 percent of burley tobacco was marketed through marketing contracts, up from 73 percent the previous year.

⁴Production costs are allocated to the year in which the production occurred. Tobacco producers producing more than 103 percent of their allotted tobacco quota could store tobacco until the following year. Storing tobacco gave 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 planted in the spring so that their quota was 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 was charged in the production year using the quota rental rate during the production year.

Flue-Cured Tobacco: Costs and Returns for 2003

Net returns to flue-cured tobacco production in 2003 fell to -\$755 per acre from -\$399 in 2002 as the value of gross production fell and cash production expenses and total economic costs rose. For comparison, net returns averaged -\$92 per acre for 1998 through 2002. Low yields contributed significantly to the reduced net returns in 2003. Yield averaged 1,946 pounds per acre in 2003, in contrast to an average of 2,254 pounds per acre for 1998 through 2002. Total economic cost in 2003 was about \$4,355 per acre, compared with an average of \$4,138 per acre for 1998 through 2002.

Gross production value per acre fell to \$3,600 in 2003 from \$3,836 in 2002. Average yield declined to 1,946 pounds per acre for 2003, down 7 percent from the previous year, while prices rose an average of 3 cents per pound to \$1.85. North Carolina and Virginia tobacco yields fell, with North Carolina yields declining to 1,902 pounds per acre from 2,102 pounds in the previous year and Virginia yields falling to 1,690 pounds per acre from 2,093 pounds. Lower yields resulted from abundant rain that limited the tobacco plant's ability to form a root system and washed fertilizer away from the plant's smaller-than-usual root system. Georgia yields rose to 2,200 pounds per acre, while South Carolina yields reached 2,100 pounds. Increased yields in those States resulted partially from a reduction in losses compared with the prior year. In 2002, the tomato spotted wilt virus plagued the tobacco crop in these States. Hurricane Isabel did not have much of an impact on the 2003 flue-cured tobacco crop, since most of the crop had already been harvested before Isabel arrived.

Both cash and total production expenses per acre rose in 2003 due to higher energy prices, agricultural labor wage rates, and quota rental rates. Total cash expenses rose about 6 percent from 2002 to an estimated \$2,601 per acre in 2003, while total economic costs rose about 3 percent to \$4,355 per acre. Rising fuel prices boosted the 2003 costs for energy-related production items like fertilizers and fuel for farm machinery and curing. Agricultural wage rates rose nearly 5 percent in 2003. A decline in the effective flue-cured tobacco quota in 2003, down 5 percent from 2002, boosted quota rental rates by an estimated 6 percent. The percentage rise in the opportunity cost of land and quota per acre was less than the estimated percentage rise in quota rental rates, since yields fell. The interest paid per acre remained stable, as interest rates remained steady on long-term agricultural loans for real estate and farm machinery. Marketing expenses per acre declined due to the yield reduction, while the opportunity costs for operating capital declined as short-term interest rates fell.

Data and Methods

Most data used to compute enterprise costs and returns 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 ARMS survey are conducted each year. One version is used to collect data for the entire farm operation, while additional versions are used to collect commodity-specific data.⁵ Data on commodities are collected on a rotating basis. Agricultural commodities included in the survey program are corn, soybeans, wheat, cotton, grain sorghum, rice, peanuts, oats, barley, sugar beets, 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 that was the last survey to collect burley tobacco production and cost information. The data was collected in personal interviews with 131 Kentucky farmers and 104 Tennessee farmers. The 1996 tobacco version of the ARMS has data on the cost of production 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 sizes 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 that may influence production costs for burley and flue-cured tobacco have occurred since the last tobacco surveys were conducted. These include quota reductions, a shift from marketing tobacco through auctions to the use of marketing contracts, use of heat exchanges for flue-cured tobacco, and increased use of larger tobacco bales. Where possible, data have been incorporated in the cost accounts to reflect these changes.⁶ The 2003 effective quota for burley tobacco was 45 percent lower than it was when the 1996 survey was conducted, while flue-cured tobacco quota had dropped 43 percent since 1995. In 2003, marketing contracts accounted for 76 percent of burley tobacco and 81 percent of flue-cured tobacco sold in the United States.

Data for computing the annual updates come from a variety of sources, mostly from the National Agricultural Statistics Service (NASS), USDA.⁷ 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.⁸ 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 quota rent.

⁵For more information on ARMS, please visit the ARMS briefing room, <http://www.ers.usda.gov/briefing/ARMS>

⁶For further information, see Linda Foreman, *Tobacco 2001 Production Costs and Returns and Recent Changes That Influence Costs*, TBS-2002-01, Electronic Outlook Report, Economic Research Service, USDA, February 2003. <http://www.ers.usda.gov/publications/tbs/feb03/tbs200201/>

⁷Access at: <http://www.nass.usda.gov>

⁸Access at: <http://www.ams.usda.gov/tob/mnacs/index.htm>

Table 1—U.S. burley tobacco costs and returns, 1996-2003

Item	1996	1997	1998	1999	2000	2001	2002	2003	Dollars per cwt							2002	2003
	Dollars per acre								1996	1997	1998	1999	2000	2001	2002	2003	
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	3,800.64	192.04	189.00	190.40	189.87	196.55	197.46	197.54	197.95	
Cash expenses:																	
Seed and plant bed	103.80	100.04	100.04	98.33	102.61	106.03	106.89	110.34	5.28	5.16	5.24	5.38	5.13	5.10	5.59	5.75	
Fertilizer	305.84	296.94	296.88	290.96	288.81	338.12	276.46	333.81	15.56	15.32	15.54	15.93	14.43	16.27	14.46	17.39	
Chemicals	97.83	98.65	100.29	99.47	98.65	98.65	97.83	99.47	4.98	5.09	5.25	5.44	4.93	4.75	5.12	5.18	
Custom operations	12.90	14.48	13.58	13.35	13.35	13.57	13.46	13.80	0.66	0.75	0.71	0.73	0.67	0.65	0.70	0.72	
Fuel, lube, and electricity	73.35	77.66	63.28	66.88	96.36	87.01	76.22	95.28	3.73	4.01	3.31	3.66	4.82	4.19	3.99	4.96	
Repairs	70.41	72.25	72.86	74.08	75.92	78.37	80.21	82.05	3.58	3.73	3.81	4.05	3.79	3.77	4.20	4.27	
Hired labor	421.80	432.59	455.40	497.01	499.76	527.29	533.45	574.81	21.46	22.32	23.84	27.20	24.98	25.37	27.90	29.94	
Marketing expenses	139.20	128.69	165.02	161.32	152.65	64.42	59.89	56.84	7.08	6.64	8.64	8.83	7.63	3.10	3.13	2.96	
Other variable cash expenses	18.10	18.58	20.58	19.88	20.78	21.50	21.32	22.22	0.92	0.96	1.08	1.09	1.04	1.03	1.12	1.16	
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	1,388.62	63.24	63.98	67.42	72.31	67.42	64.23	66.21	72.33	
General farm overhead	163.48	210.40	202.86	206.27	211.38	218.20	223.31	228.42	8.32	10.86	10.62	11.29	10.56	10.50	11.68	11.90	
Taxes and insurance	40.13	44.22	44.88	45.45	46.19	47.18	47.63	48.58	2.04	2.28	2.35	2.49	2.31	2.27	2.49	2.53	
Interest	64.50	71.22	76.68	74.57	78.79	82.31	73.16	73.16	3.28	3.67	4.01	4.08	3.94	3.96	3.83	3.81	
Total, fixed cash expenses	268.11	325.84	324.42	326.29	336.36	347.69	344.10	350.16	13.64	16.81	16.99	17.86	16.81	16.73	18.00	18.24	
Total, cash expenses	1,511.34	1,565.72	1,612.35	1,647.57	1,685.25	1,682.65	1,609.83	1,738.78	76.87	80.79	84.42	90.17	84.23	80.96	84.21	90.57	
Gross value of prod. less cash exp.	2,263.38	2,097.10	2,016.65	1,823.73	2,256.72	2,411.01	2,167.15	2,061.86	115.13	108.21	105.99	99.70	112.32	116.51	113.33	107.38	
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	1,388.62	63.24	63.98	67.42	72.31	67.42	64.23	66.21	72.33	
General farm overhead	163.48	210.40	202.86	206.27	211.38	218.20	223.31	228.42	8.32	10.86	10.62	11.29	10.56	10.50	11.68	11.90	
Taxes and insurance	40.13	44.22	44.88	45.45	46.19	47.18	47.63	48.58	2.04	2.28	2.35	2.49	2.31	2.27	2.49	2.53	
Capital replacement	91.07	97.25	100.27	104.27	134.13	142.02	153.02	163.91	4.63	5.02	5.25	5.71	6.70	6.83	8.00	8.54	
Operating capital	31.64	32.11	31.23	31.45	40.91	23.02	10.70	7.08	1.61	1.66	1.64	1.72	2.04	1.11	0.56	0.37	
Other nonland capital	104.28	113.12	104.87	102.80	94.08	88.16	89.09	79.12	5.31	5.84	5.49	5.63	4.70	4.24	4.66	4.12	
Land and quota	751.25	512.67	531.74	633.44	991.31	1,081.99	998.22	1,097.76	38.22	26.45	27.84	34.67	49.54	52.07	52.21	57.18	
Unpaid labor	585.19	600.16	631.80	689.53	693.35	731.03	740.09	797.48	29.77	30.97	33.08	37.74	34.65	35.18	38.71	41.54	
Total economic costs	3,010.27	2,849.81	2,935.58	3,134.49	3,560.24	3,666.56	3,527.79	3,810.97	153.12	147.05	153.70	171.56	177.92	176.45	184.52	198.51	
Residual returns to management and risk	764.45	813.01	693.42	336.81	381.73	427.10	249.19	-10.33	38.88	41.95	36.70	18.31	18.63	21.01	13.02	-0.56	
Price (dollars/lb and cwt)	1.92	1.89	1.90	1.90	1.97	1.97	1.98	1.98	192.16	189.00	190.40	189.87	196.55	197.46	197.54	197.95	
Yield (lb and cwt/acre)	1,966	1,938	1,910	1,827	2,001	2,078	1,912	1,920	19.66	19.38	19.10	18.27	20.01	20.78	19.12	19.20	

Source: Estimates were developed from the 1995 Farm Costs and Returns Survey and updated with current price indices; see [Data and Methods](#).

Table 2— U.S. flue-cured tobacco production costs and returns, 1996-2003

Item	1996	1997	1998	Dollars per acre					Dollars per cwt							2002	2003
				1999	2000	2001	2002	2003	1996	1997	1998	1999	2000	2001	2002	2003	
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	3,600.10	183.70	172.00	175.36	173.70	179.30	185.70	182.50	185.16	
Cash expenses:																	
Seed and plant bed	55.71	57.65	59.10	63.46	60.07	63.95	68.79	74.60	2.60	2.53	2.69	2.95	2.51	2.63	3.28	3.83	
Fertilizer	282.59	290.73	304.39	282.66	273.93	320.04	284.21	302.44	13.19	12.75	13.85	13.13	11.45	13.18	13.56	15.54	
Chemicals	216.56	218.38	220.18	218.38	216.58	216.58	214.78	218.39	10.11	9.58	10.02	10.15	9.05	8.92	10.25	11.22	
Custom operations	9.07	9.88	8.00	7.86	7.79	7.92	7.85	8.05	0.42	0.43	0.36	0.37	0.33	0.33	0.37	0.41	
Fuel, lube, and electricity	67.75	71.74	59.56	62.94	90.69	81.89	71.74	89.68	3.16	3.15	2.71	2.92	3.79	3.37	3.42	4.61	
Curing fuel	272.91	301.50	258.98	325.72	477.38	446.30	405.27	476.94	12.74	13.22	11.78	15.14	19.95	18.37	19.34	24.51	
Repairs	106.95	109.74	110.67	112.53	115.32	119.04	121.83	124.62	4.99	4.81	5.04	5.23	4.82	4.90	5.81	6.40	
Hired labor	468.02	491.96	554.12	582.09	594.35	634.61	669.52	699.63	21.85	21.58	25.21	27.05	24.84	26.13	31.94	35.95	
Marketing expenses	143.42	151.39	145.95	160.76	187.24	88.95	92.42	83.96	6.70	6.64	6.64	7.47	7.82	3.66	4.41	4.31	
Other variable cash expenses	3.91	4.01	3.88	3.81	3.98	4.12	4.09	4.26	0.18	0.18	0.18	0.18	0.17	0.17	0.20	0.22	
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	2,082.57	75.94	74.87	78.47	84.59	84.73	81.66	92.58	107.00	
General farm overhead	116.32	149.71	181.75	184.80	189.38	195.49	200.07	204.65	5.43	6.57	8.27	8.59	7.91	8.05	9.55	10.52	
Taxes and insurance	111.78	122.91	140.61	141.26	142.27	148.49	148.27	152.02	5.22	5.39	6.40	6.56	5.95	6.11	7.07	7.81	
Interest	129.03	142.47	169.37	164.71	174.03	181.80	161.60	161.60	6.02	6.25	7.71	7.65	7.27	7.48	7.71	8.30	
Total, fixed cash expenses	357.13	415.09	491.73	490.77	505.68	525.78	509.94	518.27	16.67	18.21	22.38	22.80	21.13	21.64	24.33	26.63	
Total, cash expenses	1,984.02	2,122.07	2,216.56	2,310.98	2,533.01	2,509.18	2,450.44	2,600.84	92.61	93.08	100.85	107.39	105.86	103.30	116.91	133.63	
Gross value of prod. less cash exp.	1,957.26	1,799.53	1,629.94	1,433.50	1,750.46	2,008.76	1,385.24	999.26	91.09	78.92	74.51	66.31	73.44	82.40	65.59	51.53	
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	2,082.57	75.94	74.87	78.47	84.59	84.73	81.66	92.58	107.00	
General farm overhead	116.32	149.71	181.75	184.80	189.38	195.49	200.07	204.65	5.43	6.57	8.27	8.59	7.91	8.05	9.55	10.52	
Taxes and insurance	111.78	122.91	140.61	141.26	142.27	148.49	148.27	152.02	5.22	5.39	6.40	6.56	5.95	6.11	7.07	7.81	
Capital replacement	255.67	273.03	283.70	295.02	313.34	320.86	336.10	324.49	11.94	11.98	12.91	13.71	13.09	13.21	16.04	16.67	
Operating capital	41.60	44.21	41.83	43.32	59.30	33.72	15.72	10.62	1.94	1.94	1.90	2.01	2.48	1.39	0.75	0.55	
Other nonland capital	77.81	84.40	80.10	79.19	77.52	76.83	77.64	68.95	3.63	3.70	3.64	3.68	3.24	3.16	3.70	3.54	
Land and quota	853.63	843.73	974.05	1,131.93	1,370.37	1,433.20	1,244.92	1,227.67	39.85	37.01	44.32	52.60	57.27	59.00	59.40	63.09	
Unpaid labor	189.91	199.62	224.84	236.19	241.16	257.49	271.65	283.87	8.87	8.76	10.23	10.98	10.08	10.60	12.96	14.59	
Total, economic costs	3,273.61	3,424.59	3,651.71	3,931.92	4,420.67	4,449.48	4,234.87	4,354.84	152.82	150.22	166.15	182.72	184.75	183.18	202.05	223.77	
Residual returns to management and risk	667.67	497.01	194.79	-187.44	-137.20	68.46	-399.19	-754.74	30.88	21.78	9.21	-9.02	-5.45	2.52	-19.55	-38.61	
Price (dollars/lb and cwt)	1.84	1.72	1.75	1.74	1.79	1.86	1.83	1.85	183.70	172.00	175.36	173.70	179.30	185.70	182.50	185.16	
Yield (lb and cwt/acre)	2,142	2,280	2,198	2,152	2,393	2,429	2,096	1,946	21.42	22.80	21.98	21.52	23.93	24.29	20.96	19.46	

Source: Estimates were developed from the 1996 Agricultural Resource Management Survey and updated with current price indices; see [Data and Methods](#).