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I am submitting herewith a thesis written by LaKeya Jones entitled “An Investigation of Post-Buyout Burley Tobacco Production and Trends in the Traditional Burley Regions of Tennessee, North Carolina, and Virginia.” I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Economics.

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**An Investigation of Post-Buyout Burley Tobacco Production and Trends in the
Traditional Burley Regions of Tennessee, North Carolina and Virginia**

A Thesis
Presented for the
Master of Science Degree
The University of Tennessee, Knoxville

LaKeya Jones
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DEDICATION

This thesis is dedicated to my aunt, Phyllis Jones, for always believing in me and encouraging me to do beyond my very best.

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ABSTRACT

The 2004 Fair and Equitable Tobacco Reform Act, commonly referred to as the Tobacco Buyout Program, ended the federal tobacco program. This act ended price supports and quotas, and also ended reporting requirements. The tobacco industry is now faced with new challenges in tobacco production as they have scant information to base production decisions on. The 2006 Burley Tobacco Survey provides an initial outlook of future production, challenges, trends and expectations. The results from the survey were used to analyze future production decisions. An ordered logit model reveals that producers who received prices of \$1.65/lb or more, have farms in excess of 250 acres, received less than 10 percent of total gross farm receipts from tobacco, are 34 years old or younger, or have a graduate or professional degree are more likely to continue burley tobacco production in 2007. Farmers with gross agricultural receipts of \$9,999 or less, those who make higher amounts in terms of net household income, and those producers who are from North Carolina are less likely to continue production in 2007.

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CHAPTER I

INTRODUCTION

The Fair and Equitable Tobacco Reform Act (FETRA), commonly known as the tobacco buyout program, changed the face of the U.S. tobacco production industry dramatically. Enactment of tobacco buyout legislation marked one of the most dramatic policy changes in agricultural policy history over the last half century as it moved the tobacco production industry from a highly regulated government program to a totally free market in one year (Tiller, 2005). In stark contrast to stringent requirements under the former tobacco program, U.S. tobacco farmers are now allowed to determine the type of tobacco they will produce, the quantity of tobacco they will produce, the location of their tobacco production, to whom they will market their crop, and when they market their crop. Termination of the federal tobacco programs ended policies of tobacco acreage allotments, marketing quotas, and price supports that had been in place with relatively few changes since the 1930s.

The vast majority of tobacco farmers now market their tobacco via direct contracts in contrast to nearly exclusive marketing via government sanctioned auction markets as recently as 1999. While a small percentage of farmers still sell their crop through traditional auction markets, direct contracts with tobacco manufacturers or leaf dealers have rapidly become dominant. If a producer does not use a marketing contract, he/she assumes a significantly higher level of marketing risk compared to pre-buyout minimum price guarantees. And producers who engage in marketing contracts with

tobacco product manufacturers or leaf dealers to sell their crop face new risks associated with contracting (Tiller et al., 2005).

When the tobacco program ended with the 2004 crop, the market price of U.S. tobacco dropped dramatically, about 25 percent in one year (NASS). Some tobacco farmers who leased marketing quotas for a significant portion of their production experienced lower costs of production absent the quota requirement, partially offsetting the decline in revenue. Other farmers who owned a significant portion of the quota they marketed experienced sharply lower revenues, without similar reductions in production costs, significantly narrowing profit margins and further emphasizing the need to manage risks and improve the efficiency and profitability of their operations.

One key factor in managing risks and improving profitability is access to timely and accurate market and industry information. Under the previous federal tobacco program, the U.S. government collected a significant amount of detailed and disaggregated tobacco production data, much of which was publicly available. Regularly published data included county-level tobacco acreage, production, and yields; basic and effective marketing quotas; costs of production by type (and state, in some cases); support prices by type and grade; market average prices by type and grade; marketings by type and location; stocks held by the Commodity Credit Corporation (CCC); and domestic and global industry and trade data, analyses, and outlook. With the passage of the tobacco buyout, the vast majority of the government data collection and reporting requirements were also eliminated. Ironically, post-buyout tobacco farmers are expected to adjust to a radically different and evolving market environment with only a small fraction of the market information to which they were accustomed.

With the amount of tobacco production information currently available, it is not possible to accurately estimate how many pre-buyout tobacco producers are still actively engaged in tobacco production. In some areas, tobacco industry experts have estimated that the number of tobacco producers has declined by as much as 75 percent since the buyout. While some anecdotal evidence supports these estimates, data are not available to quantify specific changes in the number of producers. In general, regional shifts in the location of tobacco production are also difficult to quantify since the geographic restrictions under the program have been eliminated. Clear indications of how many burley producers are participating in the post-buyout market, and information about their tobacco operations, production practices, and profitability do not exist.

Data on planted acreage, average market prices, levels of production, income, and other relevant factors that may provide important information for assessing the viability and sustainability of the industry are either not available or not available in time to provide growers with information that can inform their decision making. There is a lack of information about the problems and constraints that potentially influence the long term future of the industry. In general, tobacco producers do not have a strong foundation of information to lead them into the future. This unavailability of timely tobacco data and information is the primary motivation behind this research effort.

The general objective of this research project is to produce timely and unbiased information on tobacco production and tobacco farmers for the Tennessee, North Carolina and Virginia traditional burley producing region. A mail based questionnaire is used to obtain information regarding the past, current, and future state of the leaf tobacco

production industry. To achieve the general objective, the following specific research objectives are identified:

- (1) Generate primary data for post-buyout burley tobacco production in the traditional burley producing regions of Tennessee, North Carolina, and Virginia.
- (2) Provide a descriptive analysis of burley tobacco production and enterprises in the traditional burley producing regions of Tennessee, North Carolina, and Virginia in the post-buyout market.
- (3) Examine changes in farmer intentions to produce burley tobacco and the influence of market incentives, farm characteristics, household-specific characteristics, and risk perceptions on producer decisions to continue to produce burley tobacco in the post-buyout market.

The next section of the thesis provides background information and context for burley tobacco production in the three states of interest. A description of the 2006 Burley Tobacco Grower Survey is then provided, along with an overview and general description of the information collected through the survey. In the next section, a theoretical model is described, appropriate for analyzing farmer decisions whether or not to continue to produce tobacco in the future. The empirical model and results are then presented, followed by a discussion of the implications of the results for the future of the tobacco industry.

CHAPTER II

BACKGROUND AND CASE STUDY REGION

Burley Tobacco Production

This research focuses on burley tobacco, one of the primary ingredients in domestic cigarette manufacturing. Other major types of tobacco produced in the United States include flue-cured tobacco (another major component of cigarettes), dark air-cured and dark-fired tobacco (used primarily in chewing tobacco and snuff), and cigar tobacco types. While burley tobacco is a type of tobacco primarily used in cigarette production, it is also used to produce chewing tobacco and snuff and some cigar products. Burley is low in sugar but high in nicotine and it gives the tobacco smoke a light and sweet flavor. The primary end use for U.S. burley tobacco is as a primary component of the American Blend cigarette, which is a combination of flue-cured, burley, and Oriental tobacco blended into one cigarette.

Burley tobacco production is very labor intensive with few opportunities or alternatives for mechanization, though research has been underway for several years to find ways to improve the labor efficiency and reduce the hard work associated with harvesting burley tobacco (Boyette and Ellington). Modern burley tobacco production looks much like burley tobacco production did several generations ago. Modern burley production generally begins with transplanting greenhouse-grown tobacco plants into cultivated fields using dedicated tobacco setting equipment around mid-May. Field practices include chemical treatments for weed control, disease, fungus, and pests. When the plants enter the flowering stage, plants are “topped” to remove the flower and

promote more abundant growth of the valuable leaves. Once topped, the plants are chemically treated to prevent further suckering (Fisher et al.). About three to five weeks after topping, the top leaves begin to turn yellow, indicating ripening and harvest. Traditional harvesting of burley tobacco requires intensive hand labor (Boyette and Ellington). Most commonly, each plant is cut at the base and several plants are speared onto a tobacco stick and placed in the field to wilt and begin the field curing chemical transformation. After initial field curing, the cut stalks of tobacco are then transported (usually still on the sticks) to the curing location.

Burley tobacco is also referred to as air-cured because the leaf curing process has traditionally been done in large, open barns where the air is allowed to flow freely. Curing refers to the chemical and physical changes that tobacco leaves endure post-harvest and plays a pivotal role in producing quality burley tobacco. The most important factor of the curing process and producing quality burley leaves is the condition of the curing environment. The curing environment is ideal when the temperature, relative humidity, air exchange and ventilation of the curing structure are all in accordance. For burley tobacco, the preferred curing environment temperature is between 60 to 90 degrees Fahrenheit with a relative humidity of 65 to 70 percent over any given 24 hour period. Controlled ventilation is the basic means of managing the curing environment as stagnant and moist air can cause barn rot and low relative humidity can result in undesirable leaf color and smoking characteristics (Mundy and Witcher).

In recent years, much of the burley tobacco produced in the United States has shifted from being cured in barns to being field cured. The field curing process involves hanging the burley at higher densities in open-sided low-profile curing structures. The

spacing between the sticks and side cover management control the curing environment where polyethylene covers are placed over the dry leaf structures. Field curing structures generally require more intensive management efforts, but allow for more effective management of the curing environment than most conventional barns (Mundy and Witcher). Though there is no one barn or structure that is better than the other, the polyethylene field curing structure is generally a lower cost option.

Market preparation is a key factor in producing quality burley tobacco. There are several steps involved with market preparation practices that occur between leaf curing and delivery to market, including transport, stripping, separating by stalk position, baling, and stick removal, among others. Market preparation activities require intensive labor and management, and Mundy and Witcher emphasize the benefits of developing a market preparation system that is tailored to a producer's specific farm characteristics to improve efficiency and profitability.

Case Study Region

Burley tobacco has traditionally been grown in parts of eight states, including Kentucky, Tennessee, Virginia, North Carolina, Indiana, Missouri, Ohio, and West Virginia (Capehart, 2005a). U.S. burley is often referred to as “flavor” burley or “premium” burley, highly valued in the global market for its consistent quality and flavor. Burley tobacco is also produced outside the U.S., with other large contributors to global burley tobacco production including Brazil, Malawi, Zimbabwe, and Argentina.

Kentucky leads burley tobacco production in the U.S., followed by Tennessee, Virginia, and North Carolina. According to published data by the National Agricultural Statistics Service (NASS), these four states have accounted for at least 90 percent of U.S.

burley production over the last decade. This research effort focuses on burley tobacco production in the traditional producing regions of Tennessee, North Carolina, and Virginia. These three states were selected because they comprise the region served by the Burley Stabilization Cooperative (BSC), a producer owned tobacco cooperative, which provided resources to conduct the mail based survey for this research effort. The producer cooperatives were sanctioned as the operating agents for the federal tobacco price support program. Other burley tobacco states, primarily Kentucky, are organized under the Burley Tobacco Growers Cooperative.

Tennessee

Tobacco has played an important role in Tennessee agriculture for decades. It has been a primary factor in sustaining a large number of small family farms, especially in East Tennessee. Tobacco income has played an important part in allowing many rural economies to thrive and grow in areas of the state where few economic alternatives were available (Tiller, 2002). There are three types of tobacco grown in Tennessee: burley, dark air-cured and dark fire-cured, with burley being the dominant type produced. Historically, burley has accounted for about 85 percent of total tobacco grown in the state of Tennessee (Tiller, 2002). Over the 1990s, tobacco was among the top three crops in Tennessee in contributions to cash receipts, along with cotton and soybeans according to published data for Tennessee by NASS. Table 1 shows recent historical levels of burley tobacco acreage, yields, production, prices, and value of production in Tennessee.

Burley tobacco acreage in Tennessee fluctuated somewhat throughout the 1990s, but the trend turned dramatically downward in 2000 and has continued to decline. The 10-year average harvested acreage in Tennessee during the 1990s was 52,200 acres,

Table 1: Summary of Tennessee Burley Tobacco Acreage, Yield, Production, Market Price, and Value of Production (VOP), 1990-2006

Year	Harvested Acreage	Yield (lbs)	Production (thousand lbs)	Market Price (dols/lb)	VOP (thousand dols)
1990	46,000	2,060	94,760	1.747	165,546
1991	54,000	1,950	105,300	1.789	188,382
1992	64,000	2,000	128,000	1.806	231,168
1993	61,000	1,935	118,035	1.800	212,463
1994	51,000	2,125	108,375	1.837	199,085
1995	43,000	1,700	73,100	1.845	134,870
1996	46,000	1,915	88,090	1.920	169,133
1997	51,000	1,830	99,330	1.886	176,020
1998	51,000	1,795	91,545	1.907	174,576
1999	55,000	1,890	103,950	1.894	196,881
2000	37,000	1,920	71,040	1.957	139,025
2001	32,000	2,000	64,000	1.977	126,528
2002	29,000	1,830	53,070	1.968	104,442
2003	25,000	1,900	47,500	1.975	93,813
2004	24,000	1,920	46,080	1.980	91,238
2005	17,000	2,000	34,000	1.600	54,400
2006	14,000	2,200	30,800	1.600	49,280

Source: NASS

but acreage has declined every year since 1999 to a new record low of 14,000 acres in 2006. The average acreage for Tennessee in the post-buyout era has been 15,500 acres with a sharp decrease in acreage occurring between 1999 and 2000. Burley tobacco yields in Tennessee have been variable over the last 17 years, ranging from a high of 2,200 pounds per acre in 2006 to a low of 1,700 pounds per acre in 1995, with an average yield of 1,939 pounds per acre over the period. Post-buyout yields have been somewhat higher, averaging 2,100 pounds per acre, compared to an average of 1,914 pounds per acre over the 2000 to 2004 period.

Burley tobacco production in Tennessee was generally high throughout the 1990s, averaging more than 101 million pounds per year. Production dropped off sharply (32 percent) in 2000, mirroring the acreage reduction, to 71 million acres, and has declined

steadily since. Between 2000 and 2004, burley tobacco production averaged 56.3 million pounds, further declining to an average production level of 32.4 million pounds post-buyout. Comparing average production in the 1990s to average production since the buyout, production has decreased by 68 percent.

The market price of burley tobacco in Tennessee trended upward with very little variation throughout much of the 1990s and 2000s leading to the buyout. Market prices were generally a few cents over the average tobacco program price support level each year. The market price declined dramatically following the buyout, falling 38 cents between the peak year of 2004 and the first year after the buyout, 2005, and remained at \$1.60 in 2006.

Reflecting both changes in production and also price, the value of tobacco production also has declined dramatically in Tennessee. Throughout the 1990s, the value of tobacco production in Tennessee averaged \$185 million, peaking in 1992 at \$231 million. As production began to decline in 2000, so did the value of production, falling by nearly 40 percent in the early part of the 2000s, compared to the 1990s. But the decline in tobacco value accelerated after the buyout, as acreage continued its slide, coupled now with a dramatic price cut. The value of tobacco production in Tennessee has been just 28 percent of the average value during the 1990s, declining from an average of \$185 million to just under \$52 million.

Burley tobacco has been produced in the eastern two-thirds of the state, with heavy concentrations in the northeastern and north central parts of Tennessee. Greene County produced the most burley tobacco throughout the 1990s. In 2000, Macon County became the top producing county of burley tobacco in the state and continues to lead

producing counties. Burley tobacco production was the highest compared to other tobacco types for the state in 2005, with fire cured averaging 16.5 million pounds and dark air-cured averaging 1.17 million pounds (NASS).

North Carolina

Tobacco has historically been a very important part of agriculture in North Carolina. North Carolina has been the leading producer of U.S. tobacco for decades, with tobacco generating a large portion of crop receipts in the state over the 1990s. The majority of tobacco produced in North Carolina is flue-cured tobacco, with a relatively small amount of burley tobacco produced in the mountainous Western portion of the state. Table 2 shows recent historical levels of burley tobacco acreage, yields, production, prices, and value of production in North Carolina.

Burley tobacco acreage in North Carolina was relatively stable over the 1990s, averaging 7,141 harvested acres annually. In 2000, acreage decreased by only 5 percent, but it has continued to decrease dramatically into the post-buyout era. By 2005, harvested acreage was down to 3,000 acres; a 59 percent drop from 2000. Following the low in 2005, acreage jumped markedly by 27 percent in 2006. However, the reported acreage is for all of the state of North Carolina and does not report the regional location of the acreage. Much of the expansion in acreage in 2006 is reported to have been the result of expansion of burley acreage into nontraditional flue-cured production regions in the piedmont and eastern regions of the state.

Burley tobacco yields in North Carolina have generally been lower than in the larger producing states of Tennessee and Kentucky. North Carolina burley yields averaged 1,820 pounds per acre between 1990 and 1999, declining to an average yield of

Table 2: Summary of North Carolina Burley Tobacco Acreage, Yield, Production, Market Price, and Value of Production (VOP), 1990-2006

Year	Harvested Acreage	Yield (lbs)	Production (thousand lbs)	Market Price (dols/lb)	VOP (thousand dols)
1990	8,200	2,195	17,999	1.743	31,372
1991	9,000	2,000	18,000	1.772	31,896
1992	9,200	1,990	18,308	1.759	32,204
1993	9,000	2,280	20,520	1.779	36,505
1994	8,200	2,140	17,548	1.821	31,955
1995	8,100	1,290	10,449	1.843	19,258
1996	7,800	1,665	12,987	1.920	24,935
1997	8,400	1,585	13,314	1.860	24,764
1998	8,100	1,450	11,745	1.899	22,304
1999	7,800	1,600	12,480	1.909	23,824
2000	7,400	1,600	11,840	1.968	23,301
2001	6,700	1,600	10,720	1.950	20,904
2002	6,300	1,500	9,450	1.948	18,409
2003	5,700	1,250	7,125	1.950	13,894
2004	4,700	1,400	6,580	1.943	12,785
2005	3,000	1,650	4,950	1.560	7,722
2006	3,800	1,700	6,460	1.610	10,401

Source: NASS

1,470 pounds per acre between 2000 and 2004. North Carolina burley tobacco yields have increased 14 percent since the buyout, compared to the 2000-2004 average. This result was expected, as many of the low yielding traditional burley tobacco producers could no longer remain competitive in a free market with sharply lower prices.

North Carolina burley tobacco production averaged more than 15 million pounds annually throughout the 1990s. Production began to its downward trend in 2000, reaching a low point of 4.9 million pounds in 2005 before rebounding in 2006. Overall, post-buyout production has been off nearly 63 percent compared to average production in the 1990s, but appears to have begun to regain some lost production, generally in nontraditional production regions of the state. The value of burley tobacco production in North Carolina averaged \$27.9 million over the decade of the 1990s, falling to an average

of \$17.9 million between 2000 and 2004. Again, the steep drop in production, coupled with sharply lower prices after the buyout, have contributed to burley value of production the last two years far below more recent historical levels, although the value of production increased by more than one-third between 2005 and 2006. Since the buyout and elimination of quotas, burley tobacco production in North Carolina has begun to move into non-traditional regions of the state that have historically produced flue-cured tobacco. Some estimates unofficially placed about one-half of North Carolina burley production in the piedmont and coastal plains regions of the state in 2005 and 2006 (Brown, 2006). Both production and price per pound decreased in the first year following the buyout (2005), with price making a significant drop from an average of \$1.95 per pound (2000-2004) to \$1.56 per pound.

Much of the Appalachian region for burley production in North Carolina has historically been a low yielding region, which results in relatively higher per unit costs of production. As prices declined, some smaller and low yielding burley producers were at a competitive disadvantage and have exited tobacco production. As seen in the previous table, tobacco yields in North Carolina have increased since the buyout as low yielding producers have exited burley production. Burley production recovered some of its previous losses in the 2006 crop year. Harvested acreage, yield, production, price per unit, and value of production all increased with the market price increasing by five cents and production exceeding six million. Madison County, located in western North Carolina, dominates burley tobacco production for the state, averaging 3.4 million pounds of burley tobacco between 1990 and 2005 (NASS). Buncombe County is also a major producer of burley tobacco in North Carolina.

Virginia

For the past three centuries, tobacco has dominated Virginia's agriculture sector, and tobacco has been tightly woven into the culture and history of the state. Tobacco is currently Virginia's largest cash crop and Virginia is the fourth largest tobacco producing state in the U.S. (VFBF) Predominately grown in the southwest region of the state, burley tobacco has the highest amount of acres harvested in Washington, Scott, Lee, Russell and Smyth counties (VFBF). Other types of tobacco grown in Virginia include flue-cured, Virginia dark fire-cured and Virginia sun-cured types, with flue-cured being the most dominant. Flue-cured is often referred to as "flue-cured Virginia" or just "Virginia" because the state was the first to use an artificial heat method of curing (VFBF). Table 3 shows recent historical levels of burley tobacco acreage, yields, production, prices, and value of production in Virginia.

Burley tobacco acreage in Virginia increased and decreased slightly throughout the 1990s, averaging 10,830 acres. There was a significant drop in acreage between 1999 and 2000, and acreage continued to decline after 2000. Comparing 1990 to 2006, burley tobacco acreage declined by 79 percent. There was a 53 percent decrease in acreage between 2004, the last year of the federal program, and 2005. The yield for Virginia was at its lowest in 2003, but has increased since that year. Average yield over the 1990s was 1,976 pounds per acres, compared to an average yield of 1,467 pounds per acre between 2000 and 2004. Yield actually increased by 34 percent in 2005, the year following the buyout. Though there was some variation in production from 1990 to 2001, it has been on the decline since 2001. Production averaged more than 21.5 million pounds annually

Table 3: Summary of Virginia Burley Tobacco Acreage, Yield, Production, Market Price, and Value of Production (VOP), 1990-2006

Year	Harvested Acreage	Yield (lbs)	Production (thousand lbs)	Market Price (dols/lb)	VOP (thousand dols)
1990	11,000	2,055	22,605	1.744	39,423
1991	11,900	2,100	24,990	1.773	44,307
1992	12,300	2,210	27,183	1.794	48,766
1993	11,800	2,060	24,308	1.766	42,928
1994	11,000	1,935	21,285	1.832	38,994
1995	9,000	1,540	13,860	1.843	25,544
1996	9,500	1,835	17,433	1.920	33,471
1997	10,800	1,905	20,574	1.903	39,152
1998	10,400	1,940	20,176	1.892	38,173
1999	10,600	2,180	23,108	1.896	43,813
2000	7,000	1,600	11,200	1.974	22,109
2001	7,700	1,620	12,474	1.979	24,686
2002	7,200	1,575	11,340	1.975	22,397
2003	6,500	1,150	7,475	1.972	14,741
2004	5,900	1,390	8,201	1.977	16,213
2005	2,800	2,100	5,880	1.575	9,261
2006	2,300	2,000	4,600	1.600	7,360

Source: NASS

between 1990 and 2000, declining by 53 percent to an average of just over 10 million pounds between 2000 and 2004. Production has continued to decline following the buyout, reaching an historical low level of just 4.6 million pounds in 2006. Comparing 1990 to 2006, production has decreased by 80 percent in the state.

The market average price was on an upward trend throughout all of the 1990s and early 2000s with very little variation, at levels slightly above the government support price. Price dropped by 40 cents in 2005, the year following the buyout, but increased slightly in 2006. In the post buyout era, the value of production for Virginia burley tobacco averaged just \$8.3 million, off 79 percent from the average value throughout the 1990s of \$39.5 million. Washington County dominated burley production for the state of

Virginia from 1990 to 2004, but Scott County led in production in the post buyout year of 2005.

CHAPTER III

REVIEW OF LITERATURE

Tobacco Program and Buyout Background

The federal tobacco program was instituted as part of the Agricultural Adjustment Act of 1938, designed to stabilize the U.S. tobacco market and to increase prices and incomes for tobacco farmers. It has played an important role in Appalachian and Southeastern agriculture for many generations and has preserved tobacco as a vital source of income (Fowlkes). Price supports and supply control were the two main components of the federal program, with the continuation of the program being decided by a referendum vote for each tobacco type every three years (Tiller et al., 2005). The federal tobacco program guaranteed a minimum price for farmers in exchange for limiting the amount of tobacco marketed and produced.

When tobacco quotas were created, they were initially based upon historical production patterns and farmers were restricted on the amount of tobacco they could plant (i.e., acreage, quota restrictions). Over time, the majority of the tobacco produced in the U.S. was converted from an acreage-based production quota to a poundage-based marketing quota and the program underwent a few modifications, primarily affecting the sale and transfer of quota (Tiller et al., 2005). Annual quotas were determined by a formula that included domestic tobacco manufacturers' purchase intentions, the three-year average of exports, and a reserve stock adjustment, with limited quota adjustment flexibility given to the Secretary of Agriculture (Tiller et al., 2005). Quotas could be rented or sold with certain constraints that usually preserved the geographic location of

the quota. All grades of tobacco were assigned a federal minimum price level guarantee determined by a formula based on changes in cost of production and a weighted average of lagged market prices at the start of each new marketing year. During those times, quota tobacco was sold at an auction to the highest bidder. Any tobacco that did not receive a bid at or above the minimum price was purchased using federally guaranteed non-recourse loans from the USDA's Commodity Credit Corporation (CCC).

The federal tobacco program has operated as a no-net cost program since 1982. This means that all of the costs of operating the price support loan program were covered by assessments charged on every pound of tobacco marketed (Tiller et al., 2005). The no-net cost assessment was shared equally among buyers, producers and importers that marketed tobacco. While no-net cost assessments were required by law to cover price support loan program operations plus interest, tobacco also benefited from government outlays (Tiller et al., 2005; Womach, 2005b).

For many years, the federal tobacco program was quite successful at stabilizing the domestic tobacco market. The program assured tobacco farmers a profitable return for their crop and was the foundation of price and income support usually at no taxpayer expense. The federal program flourished for several years because of limited competition from foreign producers, primarily due to the significant difference in the quality of tobacco and the fact that most tobacco growers controlled production quotas.

The tobacco program has experienced significant and varied pressures over the past few decades. The U.S. had an advantage in tobacco quality in global markets and because of this, limited production via quota restrictions supported prices higher than a free market could support. The program set annual quotas at the required level to achieve

the program mandated support price. By program formulas, the support price increased over time and had little room to adjust downward in response to changing market conditions. As a result, the price stability that was driven by the production limiting quotas was achieved through production instability as annual quotas adjusted downward to maintain high support prices (Tiller et al., 2005).

The federal tobacco program implemented changes in the mid 1980s to enhance global price competitiveness, but the changes resulted in only weak responses to changing world market conditions. Quota declines, high rents and inflated market prices made competition in the global market difficult (Womack). The quality of foreign grown tobacco improved significantly in the late 1980s and early 1990s, and in response, buyers around the world began substituting foreign tobacco for the U.S. tobacco in their blends (Tiller et al., 2005). In 1993, Congress tried to address some of the tobacco program problems by requiring that cigarettes manufactured in the U.S. contain at least 75 percent U.S. produced tobacco leaf. This measure was repealed by Congress when it was shown to be in direct conflict with trade liberalization commitments under the General Agreement on Tariffs and Trade (predecessor of the World Trade Organization) with U.S. global trading partners (Womack).

By the late 1990s, it was becoming clear to most tobacco industry participants that the federal tobacco program was unsustainable in its present form and that policy change was likely necessary to address tobacco grower and industry issues.¹ The first serious attempt to radically change the existing federal tobacco program came in 1997 during

¹ For a more in depth discussion of the factors and conditions that contributed to the unsustainability of the current federal tobacco program and the various policy changes proposed and discussed prior to the eventual passage of tobacco buyout legislation, see Tiller, 2003a; Tiller, 2003b; Tiller, Brown and Snell 2004; Tiller, Snell and Brown 2005; Womack 2005.

discussions of a proposed settlement to class action lawsuits that most states had filed against tobacco manufacturers for costs incurred to treat sick smokers. A 1997 settlement proposal introduced in Congress also included a \$23 billion buyout of the federal tobacco program and transition to a new set of tobacco policy programs. Ultimately, the legal issue was resolved in 1998 with passage of the tobacco Master Settlement Agreement (MSA), an agreement between major manufacturers and 46 states involving payment of \$206 billion to states. Unlike previous settlement proposals, the MSA did not require Congressional approval, and thus the first serious attempt at tobacco buyout legislation did not come to fruition.

Between 1997 and 2004, there were dozens of proposals for changing U.S. tobacco farm policy that were discussed or proposed involving changes to or elimination of various aspects of the federal tobacco program and compensation payments to tobacco farmers. The tobacco farming community had mixed reactions to various proposals, concerned with differing impacts of a buyout by tobacco type, differing elements of future tobacco policy, and differing levels of compensation payments based on differing criteria, among other things (Tiller et al., 2005). After several unsuccessful attempts to move tobacco buyout legislative proposals forward, the tobacco program was finally terminated through tobacco buyout legislation enacted in 2004. The Fair and Equitable Tobacco Reform Act (FETRA) was included as Title VI of the American Jobs Creation Act of 2004, a broad piece of corporate tax reform legislation, signed and enacted on October 22, 2004 (P.L. 108-357).

The total cost of the buyout program was estimated to be up to \$10.1 billion with \$9.6 billion being distributed as direct buyout compensation payments to quota owners

and active producers over a 10 year period. An additional \$500 million was authorized for disposition of stocks held by grower associations and the Commodity Credit Corporation (CCC) (Brown, 2004). The U.S. Department of Agriculture's Farm Service Agency (FSA) was charged with implementing the buyout. The entire cost of the buyout was funded through quarterly assessments on tobacco product manufacturers and importers, handled through the CCC. No taxpayer dollars were authorized to fund the buyout.

Participation in the Tobacco Transition Payment Program (TTPP), i.e., receiving a tobacco buyout compensation payment, is completely voluntary. However, tobacco quota and price support programs were terminated for all of the tobacco producing industry, regardless of whether a producer claimed the TTPP contract payment or not (Tiller et al., 2004). To have been eligible for a TTPP contract payment, a producer must have owned a tobacco quota in 2002 and/or been an active tobacco producer (meaning they shared in the risk of producing tobacco) in at least one of the crop years 2002, 2003 or 2004. Quota owners (numbering about 416,000, including 57,000 active producers and 359,000 landlords) as of the date of enactment were eligible to receive \$7 for each pound of basic tobacco quota owned (Womach, 2005a). Active tobacco growers (numbering about 57,000) were eligible to receive \$3 per pound of marketing quota they produced in 2002, 2003, and 2004 (Tiller et al., 2004 and Womach, 2005a).

For each approved TTPP contract, the CCC is responsible for making equal annual payments over the 10-year period, 2005-2014 (Womach, 2005a), and is not allowed to make any lump sum payments. However, a third party entity may enter into an assignment contract (which transfers only the rights to the TTPP payment) or successor

in interest contract (which transfers the actual TTPP contract) to pay a discounted lump sum to TTPP contract holders in exchange for their expected payment stream (Tiller et al., 2005).

Once these significant tobacco policy changes were enacted with the 2005 tobacco crop, tobacco economics and markets changed dramatically. The general goal of the tobacco buyout program was to increase the competitiveness of tobacco farmers who desire to continue to produce tobacco in the post buyout era and remove the majority of inactive tobacco growers who benefited from the quota program while compensating them for their lost assets. Though the hope is that the U.S. burley industry will remain viable and profitable, the reality is that there is more uncertainty in the industry for growers and buyers than ever before. Burley tobacco producers are now expected to make sound production and marketing decisions with limited foundations of data and information to base their decisions.

Tobacco Data Availability

Table 4 shows the availability of data relevant for burley tobacco. The USDA's National Agricultural Statistics Service (NASS) collects data about burley tobacco production for all states that grow burley tobacco. NASS reports data for harvested acreage, production, yields, price per unit and value of production on a state and county level. Furthermore, they report a season average price and state tobacco planting intentions. The Agricultural Marketing Service once reported data regarding tobacco sales and marketing, daily and weekly auction market prices by location, and tobacco stocks that were placed under loan. In the post buyout era, no information is available. In the pre-buyout era, the Foreign Agricultural Service (FAS) once reported a global

Table 4: Tobacco Production and Market Data Availability

Pre-Buyout	Post-Buyout
<i>Farm Service Agency</i>	<i>Farm Service Agency</i>
Farm Sizes and Locations Amount of Quota Owned by Farm ^a Amount of Quota Grown by Farm ^a Tobacco Marketings Acreage Yields Price Per Unit County Level Data State Level Data, by Type	No detailed information available
<i>NASS</i>	<i>NASS</i>
Acreage Planting Intentions	Acreage Planting Intentions
Harvested Acreage Production Yields Season Average Market Price Value of Production (County/State Level) Planting Intentions	Harvested Acreage Production Yields Season Average Market Price Value of Production (County/State Level) Planting Intentions
<i>Agricultural Marketing Service</i>	<i>Agricultural Marketing Service</i>
Sales and Marketings by Location Daily/Weekly Auction Market Prices by Location Tobacco Stocks Placed Under Loan	No information available
<i>Foreign Agricultural Service</i>	<i>Foreign Agriculture Service</i>
Global Tobacco Market Situation & Outlook Periodic Detailed Country Production Reports	No information available
<i>Economic Research Service</i>	<i>Economic Research Service</i>
Quarterly Tobacco Situation & Outlook Annual Tobacco Yearbook Annual Costs and Returns by Type Periodic Production Special Reports	Semi-annual Tobacco Situation & Outlook
<i>Census of Agriculture</i>	<i>Census of Agriculture</i>
Number of Tobacco Farms Tobacco Acreage, Yields, Production Harvested and Irrigated Acreage Demographic and Descriptive Data by Farm Categories	Number of Tobacco Farms Tobacco Acreage, Yields, Production Harvested and Irrigated Acreage Demographic and Descriptive Data by Farm Categories

^aPer Producer

tobacco market situation and outlook. The agency also had detailed country reports. In the post buyout era, information about tobacco is no longer available.

The Economic Research Service (ERS) issues a tobacco situation and outlook report that is published semi-annually in the post buyout era. Prior to the buyout, the tobacco situation and outlook was published quarterly, there was an annual tobacco yearbook, information regarding the annual costs and returns by tobacco type, and periodic special reports on production. The Census of Agriculture, conducted by NASS, reports the number of tobacco farms, production, and harvested and irrigated acreage, with geographical disaggregation down to the county level where possible while still preserving anonymity of responses. While these data are a valuable source of information about tobacco producers and tobacco production, the Census of Agriculture is only conducted once every five years with the last Census conducted in 2002. Though another Census of Agriculture is expected in 2007, the results from that study will not be released until 2009. Since the dramatic changes in tobacco production began in the mid 1990s, only two data points are available for the tobacco industry, 1997 and 2002, and no data will be available for the post-buyout market until 2009, five years after the program was terminated.

Arguably, the most important source of data that is no longer available is that from the Farm Service Agency (FSA). Prior to the buyout, FSA produced comprehensive data on burley tobacco farms, farm sizes, and their locations; the amount of quota owned and grown per producer; acreage, yields, price per unit, etc., per state and per county. Technically, tobacco farmers are still required to report their annual acreage and production to their local FSA service center. However, given that there is no federal

program that requires this reporting, the reporting requirement is essentially voluntary and actual reporting post-buyout has been minimal. With this information no longer collected, there is a major void to be filled in the tobacco industry.

Other Studies

A University of Kentucky researcher conducted a study on post buyout burley production. The study was completed at the end of 2005 to the beginning of 2006 and surveyed county extension agents from the state of Kentucky (Appendix A). The study asked respondents about their 2005 and 2006 crop. Questions ranged from percentage change in burley acres from 2005 compared to 2004, average burley yield for 2005, concerns for the 2006 crop, and identifying reasons why farmers did or did not take the lump sum option for buyout compensation payments. The reported results are from 68 counties in Kentucky, representing 76 percent of the 2004 quota. A sample questionnaire and the summarized results from the study are included in Appendix A.

Another researcher at the University of Kentucky conducted a study on tobacco production in Kentucky in 2005 (Appendix B). This study used a mail based survey instrument to obtain information on farming characteristics, demographics, and tobacco production. The survey inquired about community involvement, personal goals and character traits, business endeavors, and a series of hypothetical scenarios involving business decisions. A few of the questions in the Kentucky study are similar to those asked in the mail based questionnaire used for this study. However, the nature of this study is more personal and focuses more on the possibility of establishing a new business. Preliminary results for the survey are not available at this time.

Robert Beach of Research Triangle International led a study in 2005 on tobacco farmer interest and success in diversification. This paper focuses on flue cured tobacco production in North Carolina. The basis of the research is a survey of North Carolina tobacco farmers conducted in 1997, 1999, 2001, and 2004. The purpose of the survey was to elicit information on tobacco production, attitudes, knowledge, and behaviors regarding on-farm diversification, off-farm employment, tobacco manufacturers, tobacco control and other key issues (Beach, 2005). The theoretical framework of Beach's study serves as the foundation of the theoretical framework for this study and is discussed in more detail in subsequent sections.

Survey Methods

While crafting the mail-based questionnaire, several considerations were taken into account to ensure the integrity of the survey responses and to increase response rates. Before deciding the questions to be used in the questionnaire, it is important to know what kind of evidence is needed to fulfill the purpose of the study and to know and understand how the information will be used (Powell and Marshall). Ways of achieving this included making a list of what needed to be achieved from the survey, checking other sources that may have completed similar research, and eliminating ambiguous and non-essential questions (Powell and Marshall). Powell and Marshall emphasize that the questionnaire should be pleasing to the eye and easy to complete. They provide several suggestions for a concise survey such as simple and clear wording, the importance of detail, including all necessary information, avoiding questions that are too time consuming or double barreled, avoiding bias and making assumptions, and the value of planning ahead.

There are essentially two types of questions that can be asked on a survey. Open ended questions allow for the respondent to state his or her own answer without being given a range of answer selections from which to choose. Though open ended questions are the easiest to compose, they are more difficult to analyze. Close ended questions usually have an ordered selection of answers to choose from, such as two-option response, ordered choice and one best answer. Close ended questions with an unordered response category allow for the respondent to rank a set of answers according to the directions provided. The ordered response category close ended questions allow for respondents to select answers according to a scalar concept (Dillman). Close ended questions are generally preferred and they play a vital role in the process of collecting data for this research project.

Dillman gave thorough direction on the length and relevance of each question as it fits into the survey project. The author outlines several examples of formatting questions that do not flow and ways of re-formatting those questions by tailoring them to specific survey needs. The author also states that the formatting should be consistent throughout the questionnaire. For example, if the arrangement of the first question has the answer choices listed in the number format, every question following that first one should have the answer choices listed in the number format; proper design should not switch from numbers to letters in the middle of the survey. The directions for the questionnaire should be clearly stated at the beginning and more specific directions for specific questions that have more than one answer selection should be indicated with that particular question. It is also important to provide respondents with an estimate of the range of time that will be required to complete the questionnaire.

Respondents must know that the answers they provide will be kept strictly confidential and will be used for research purposes. When the participants of the questionnaire feel that their answers play an important role in the research process, they are more apt to answer each question. Also, when participants are assured that their individual responses cannot be identified, they are more likely to provide truthful and accurate answers.

The Dillman method includes five needed elements for achieving high response rates. The first element is to have a respondent-friendly questionnaire, which is achieved through careful survey design and formatting while paying close attention to detail in terms of the questions and the survey as a whole. Ensuring that the questions are easy to understand and having a questionnaire layout that is in agreement with visual principles of design for simple comprehension and response are two key components to this element. Second, potential respondents must be contacted by first class mail. Dillman suggested that the surveying process includes four of the following five compatible contacts:

- A brief pre-notice letter, sent to respondents or contacts of the survey sample a few days prior to sending the actual survey. This step is important because persons in the survey sample are aware that the survey will arrive soon and they will anticipate its arrival.
- The actual questionnaire. It is very important to include a cover letter explaining the purpose of the survey and the need for their participation.
- A thank you post card. The post card should be sent a few days to a week after sending the actual questionnaire. Not only does this post card express appreciation

for the respondent's participation, it also reminds those respondents that have not complied to please complete and return their survey.

- A replacement questionnaire. This questionnaire is sent to those in the survey sample that have not responded. It should be sent 2-4 weeks after the initial survey.
- A final contact. Final contact should be made by telephone if telephone numbers are available or by first class or priority mail 2-4 weeks after the replacement questionnaire.

For this study, it is not necessary to perform the fourth or the fifth element. To ensure the confidentiality of the respondent, each survey had business reply postage on the back.

There was no way to track each individual who filled out each survey and there was no way of detecting who returned each survey.

The third element is to have return envelopes with real first class stamps. The questionnaire is less likely to be discarded when the return postage is paid. Due to the sensitive nature of this study, business reply mail was the better postage option as it was the more cost efficient option. Fourth, the correspondence must be personalized. The more personal and official the questionnaire, the more likely the respondent will comply. If the respondent can identify with the fact that a questionnaire was composed by a real person and not by a computer, they are more likely to comply. The fifth and final element is to offer token prepaid financial incentives. According to Dillman, the inclusion of small, token financial incentives of one to five dollars with a request to respond to a mail questionnaire can improve response rates significantly. Each one of these elements plays a pivotal role in improving response rates. This study follows the Dillman method as

closely as possible. Certain parts of the study do not correspond to the Dillman method because of the nature of this research project.

CHAPTER IV

METHODS AND PROCEDURES

Data and Variables

Data were obtained from the results of the 2006 Burley Tobacco Survey that was developed in Spring 2006. The survey included a cover letter explaining the need and purpose of the survey and assuring respondents that all responses will be kept confidential. An assortment of 32 questions was included in the survey, divided into specific sections: tobacco production, future production, farming operation, and demographic characteristics of the primary decision maker of the household.

The tobacco production questions pertain to production in 2004, 2005 and 2006. Since all reporting requirements were eliminated with the federal tobacco program, it is essential to gather information about the burley crop just before and just after the buyout took place. Questions about contracts, average sales price and yield per acre were included in this section. Under future production, the questions are aimed at the probability of still being in the industry up until 2015 and factors influencing that decision. The future production section inquires about the significance of federal crop insurance subsidies and issues that may cause a producer to exit the industry. The importance of investments, financing and perceived challenges for the burley producer are also highlighted in this section. Under the farming operation segment, questions addressing total acreage, other farming enterprises and the relative importance of various sources of industry information. Queries dealing with net farm income and gross agricultural receipts for the total farming operation and his/her tobacco operation are

asked in this section. These questions were included to determine the role of tobacco production in the larger farming operation and to estimate the profitability of tobacco enterprises post-buyout. The demographics questions were standard, yet constructed with caution to increase the probability of obtaining reliable responses. For instance, questions regarding the level of education can include completion of post graduate degrees. This particular survey need not go up to the dissertation level. According to Dillman, instead of providing response ranges from *some high school* to *doctoral degree*, a more appropriate range would be *no formal education* to a *graduate or professional degree*.

The survey instrument was pre-tested with a focus group of tobacco farmers and was designed with input and feedback from a variety of economists, agronomists, industry organization representatives, and Extension specialists working in tobacco, following recognized survey standards, techniques, and recommendations (Dillman; Tiller and Jones). The survey questionnaire is available in Appendix C.

Since the buyout, a database of active tobacco farmers does not exist. The most recent database of tobacco producers available includes tobacco farmers who received a contract payment under the tobacco buyout, available through the Farm Service Agency. There are two types of contracts under the tobacco buyout program. A tobacco quota owner contract is for the owner of a farm for which a basic marketing quota was established for the 2004 marketing year. A tobacco quota producer contract is for an owner, operator, landlord, tenant or anyone else who shared in the risk of producing tobacco on a farm. For this study, the tobacco quota producer (the grower) is the primary concern. Any tobacco farmer who shared in the risk of producing tobacco in 2002, 2003 and/or 2004 qualified for an active grower TTPP contract under the tobacco buyout

program. There were a total of 28,779 Tobacco Transition Payment Program (TTPP) contracts for active producers of burley tobacco representing 18,677 households across Tennessee, North Carolina, and Virginia (Appendix D). This number (28,779) included multiple producer contracts where an individual fell into one of the following three categories: an individual producer had one or multiple contracts for the same address, an individual producer had one or multiple contracts for different addresses, or an individual address had one or several contracts assigned to it with different individual names. This number (28,779) also included those farms that fell on state lines between either Tennessee and North Carolina, North Carolina and Virginia, or Virginia and Tennessee. The target population for the survey was households producing burley tobacco. Thus, the TTPP active grower observations were initially collapsed and merged with a separate FSA database containing contract amounts (but without individual-specific information) to reflect a unique observation for each individual household.

The observations were then collapsed to reflect one individual name, regardless of the number of contracts that he or she had. The number of contracts that the individual had was included, but instead of there being multiple entries with one name, there was one name with the number of contracts noted. This collapse did not include addresses. The last collapse included assigning one address for each household, regardless of the number of contracts that were assigned for that address. If an address had more than one individual assigned to it, the entry reflected both individuals' names and the total number of contracts for that address and the total value of the contracts associated with that household. Once the databases were merged, the total number of observations decreased to 15,644.

From this total (15,644), a stratified sample of 6,000 observations was drawn from the database. The sample was stratified to ensure that the sample cross section among states reflected production in the three states and to increase the probability of sampling growers who were more likely to still be actively producing tobacco. It was important that the number of surveys that went to each state matched the relative share of production in each state. Each state's percentage of harvested burley acreage from 2002-2004 was taken from NASS and multiplied by 6,000 to retrieve the sample size for each state. The sample size for Tennessee was 4,094, for North Carolina was 877, and for Virginia was 1,029. These numbers represent the total number of surveys that would be mailed to each state, but does not reflect which producer the survey would be sent to in each state. Additional information about the sample stratification details are included in Appendix E.

It was hypothesized that the contract amount may be indicative of the likelihood of current production. Those producers that had higher contract amounts were hypothesized to be more likely to still be producing and, in turn, would be more likely to complete the survey. The average contract amount for Tennessee was \$14,515, for North Carolina was \$12,258, and for Virginia was \$9,651. Each producer whose contract amount was at or above their respective state average was included in the survey sample. Those producers whose contract amount fell below their respective state average were chosen at random to be included in the survey sample. This filtering process continued until the sample totaled 6,000 observations.

Six thousand surveys were sent by first class mail on May 15, 2006. Completed surveys began to arrive by the end of May. Reminder and thank you postcards followed

and by the end of June, a total of 813 surveys had been returned garnering a 13 percent response rate.

Table 5 shows summary statistics from the survey. Preliminary statistical analyses were conducted immediately after the survey results had been recorded and coded. Results were reported from the states of Tennessee, North Carolina, Virginia, Kentucky and Oregon with 70 percent of the respondents having their primary farming operation in Tennessee². Of the 813 responses, approximately 46 percent of producers are still producing burley tobacco and 54 percent indicated that they are no longer actively producing tobacco.

For Tennessee, of the 546 responses, 53 percent indicated that they are no longer producing tobacco. In North Carolina, of the 86 respondents, 61 percent have exited production and in Virginia, of the 114 responses, 48 percent have exited tobacco production. Among the 54 percent total that indicated they are no longer producing tobacco, the majority of them exited production after the 2004 crop, following the last year of the federal tobacco program. Among those growers still actively producing tobacco in Tennessee in 2006, the average planted acreage is 9.1 acres of burley, with North Carolina averaging 7.3 acres and Virginia averaging about 4.8 acres. The dramatic reduction in contract prices, increasing costs of hiring labor, and the increasing costs of nitrogen fertilizer were the primary issues that farmers perceived to be the biggest challenges in the next two to five years.

² Producers in states outside Tennessee, Virginia, and North Carolina were eligible to receive a TTPP contract as an active tobacco producer in those states if they certified that they actively participated in tobacco production in the target state, although their address of record did not have to be in the same state as the location of the eligible tobacco farming operation.

Table 5: Preliminary Results: Summary Statistics of Tobacco Acreage

Growing Tobacco in 2006			Not Growing Tobacco in 2006		
Tennessee					
Status	<i>n</i>	%	Status	<i>n</i>	%
	256	46.9%		290	53.1%
North Carolina					
Status	<i>n</i>	%	Status	<i>n</i>	%
	34	39.5%		52	60.5%
Virginia					
Status	<i>n</i>	%	Status	<i>n</i>	%
	59	51.8%		55	48.3%
Survey TOTAL					
Status	<i>n</i>	%	Status	<i>n</i>	%
	374	46.3%		433	53.7%

The analysis performed in this study is limited to those producers that indicated they were still actively producing burley tobacco in 2006. The responses were used to evaluate the likelihood of a 2006 tobacco producer still producing tobacco in 2007. Responses to the questions about the likelihood of production were divided into four categories. The first category is the Producing category, which includes those producers who indicated on the survey that they definitely intend to still produce burley tobacco in 2007. The second category is the Probably Producing category, which includes producers who indicated that they would probably still produce in 2007. The third category, Undecided, includes those producers who indicated on the survey that they are not sure about producing burley tobacco in 2007. The fourth and final category, Exiting, includes those producers who indicated that they will probably not or definitely not produce burley tobacco in 2007.

Table 6 shows the survey results examining the likelihood of production in 2007. Statistical tests were performed to determine whether the distribution of producers among the four categories—Producing, Probably Producing, Undecided, and Exiting—was

Table 6: Likelihood of Producing in 2007

Survey Total		
Status	<i>n</i>	%
	374	46
Category	<i>n</i>	%
Producing	62	17
Probably Producing	163	43
Undecided	132	35
Exiting	17	5

significantly different across states. Absent statistical significance, and considering the very small number of responses in some states for some categories (particularly the Exiting category), the data are not further categorized by state in the analysis. Among current producers, 17 percent are in the producing category, 43 percent are in the probably producing category; 35 percent are in the undecided category; and five percent are in the exiting category (Tiller and Jones). The question types on the survey varied. Some variables were likert-response questions, others were either yes/no, ordinally ranked, multiple-response, or continuous.

Theoretical Framework

Following the approach in Beach (2005), a household is assumed to maximize utility subject to a time constraint and a budget constraint. The household production function for a farmer who is facing the decision to produce burley tobacco in a future year (H) is specified as:

$$1) \quad H = H(HS, MI, RE, RU, BF)$$

where HS represents a vector of household-specific characteristics; MI is a vector of market incentives; RE is a vector of resource endowments; RU is a vector of

characteristics under risk and uncertainty; and BF represents a vector of biophysical factors.

The time constraint is specified as:

$$2) \quad T = T_o + T_f + T_l$$

where T_o represents the time spent for off-farm labor, T_f represents time spent for on-farm labor, and T_l represents time devoted to leisure. Time spent for leisure activities includes daily household tasks, such as child care and chores, and also includes time spent on activities other than on-farm and off-farm work.

The budget constraint is specified as:

$$3) \quad I_h = (PY - E) + (PQ - C) + W_r W_h + I_o$$

where I_h represents the total net household income; $PY - E$ equals the tobacco income, where P represents price, Y equals yield and E equals expenses; $PQ - C$ equals other farm operation income, where P represents price, Q represents quantity, and C equals costs; W_r represents wage rate; W_h represents the hours worked at the wage; and I_o represents other income.

The framework is representative of the decision making process of a producer. The producer considers several factors before ultimately making a production decision. The goal is to measure what specifically influences a producer's production decision, and the statistical model chosen to measure that decision is the ordered logit model.

An ordered logit model is used to determine the factors that influence a farmer's decision to produce or not produce burley tobacco in the future. The ordered logit model was chosen due to the ordinal nature of the dependent variable, its mathematical

simplicity compared to the ordered probit, and the natural ordering of the responses and the discrete nature of the response levels (Nieme et al.; Lu).

The ordered logit model is specified as:

$$4) \quad y^* = \beta'x + \varepsilon$$

where y^* is an unobserved value that represents the farmer's decision of whether or not to produce; x is the matrix of measurable factors (explanatory variables); β is a parameter vector; and ε is the error term, assumed to have a standard logistic distribution (Greene, 1997). What we observe from the survey responses is:

$$\begin{aligned} 5) \quad y &= 0 \text{ if } y^* \leq 0 \\ &= 1 \text{ if } 0 < y^* \leq \mu_1 \\ &= 2 \text{ if } \mu_1 < y^* \leq \mu_2 \\ &= 3 \text{ if } y^* \geq \mu_2 \end{aligned}$$

The μ 's are unknown parameters to be estimated with β . The dependent variables must begin with 0 to allow for the estimation of the intercept term (Dixon et al.). The μ 's were calculated from estimates of $\beta'x$, where $-\beta'x$ is the threshold that divides the probability of a response being 0 or 1, $\mu_1 - \beta'x$ is the threshold dividing the probabilities of a response being 1 or 2, and so on. This procedure provides estimates of the probabilities that an outcome will be 0, 1, 2, or 3 (Greene, 1993).

The unknown parameters are estimated using LIMDEP and marginal effects were calculated for each variable. The marginal effects are calculated to determine the effect of a change in an independent variable on the probability that the dependent variable will take a particular value (Torbett et al.; Aradhyula and Tronstad). For this model, each variable will have four marginal effects, one for each ordinal category, that will show the

effect on the probability that $y=0, 1, 2$ or 3 . The marginal effects of continuous variables were calculated by differentiating the probabilities with respect to the explanatory variables (Larkin et al., Roberts et al.). An example of how the marginal effects for dummy variables were computed is included in equation 6. The marginal effects for dummy variables in the probability of definitely or probably not producing ($y=0$) were computed as:

$$6) \quad \text{Prob}[y=0 | x_i=1] - \text{Prob}[y=0 | x_i=0]$$

where y represents the likelihood of producing in 2007, from the probably or definitely not producing (0) to the definitely still producing category (3), and x_i is the i^{th} dummy variable (Greene, 2002b).

The log-likelihood function of the ordered logit model can be expressed as (Maddala, 1983):

$$7) \quad L^* = \log L = \sum_{i=1}^n \sum_{j=1}^k Z_{ij} \log [\Phi(\mu_j - \beta'x_i) - \Phi(\mu_{j-1} - \beta'x_i)]$$

where

$$8) \quad \begin{aligned} Z_{ij} &= 1 \text{ if } Y_i \text{ falls into the } j\text{th category} \\ Z_{ij} &= 0 \text{ otherwise } (i = 1, 2, \dots, n, j = 1, 2, \dots, k) \end{aligned}$$

We assume that ε is logistically distributed across all observations. The mean and variance of ε are standardized to 0 and 1 with the following probabilities:

$$9) \quad \begin{aligned} \text{Prob}(y = 0) &= \Phi(-\beta'x) \\ \text{Prob}(y = 1) &= \Phi(\mu_1 - \beta'x) - \Phi(-\beta'x), \\ \text{Prob}(y = 2) &= \Phi(\mu_2 - \beta'x) - \Phi(\mu_1 - \beta'x) \\ \text{Prob}(y = 3) &= 1 - \Phi(\mu_3 - \beta'x) \end{aligned}$$

with Φ representing the commonly used notation for standard logistic distribution (Greene, 1997).

CHAPTER V

RESULTS

Variable means, definitions, and hypothesized effects are presented in Table 7.

The ordered logit model was specified as:

$$(10) \quad \text{Lik07}_i = \beta_0 + \beta_1 \text{ACRES06}_i + \beta_2 \text{YIELDLO}_i + \beta_3 \text{YIELDHI}_i + \\ \beta_4 \text{PRICELO}_i + \beta_5 \text{PRICEHI}_i + \beta_6 \text{AC049}_i + \beta_7 \text{AC5099}_i + \beta_8 \text{AC250MOR}_i + \\ \beta_9 \text{OTHRTOBY}_i + \beta_{10} \text{SHAREHH2}_i + \beta_{11} \text{SHAREHH3}_i + \beta_{12} \text{GRRECLO}_i + \\ \beta_{13} \text{GRRECHI}_i + \beta_{14} \text{TGR10}_i + \beta_{15} \text{TGR1024}_i + \beta_{16} \text{TGR5074}_i + \\ \beta_{17} \text{TGR7599}_i + \beta_{18} \text{TGR100}_i + \beta_{19} \text{AGELO}_i + \beta_{20} \text{AGEHI}_i + \beta_{21} \text{HHSIZE1}_i + \\ \beta_{22} \text{HHSIZE3}_i + \beta_{23} \text{HHSIZE4}_i + \beta_{24} \text{HHSIZE5}_i + \beta_{25} \text{INC024K}_i + \\ \beta_{26} \text{INC5074K}_i + \beta_{27} \text{INC7599K}_i + \beta_{28} \text{INC100K}_i + \beta_{29} \text{FTOFF}_i + \\ \beta_{30} \text{PTOFF}_i + \beta_{31} \text{RETIRED}_i + \beta_{32} \text{NOEDUC}_i + \beta_{33} \text{COLLEGE}_i + \\ \beta_{34} \text{GRAD}_i + \beta_{35} \text{CONTNO}_i + \beta_{36} \text{STATE2}_i + \beta_{37} \text{STATE3}_i + \varepsilon_i$$

where LIK07 is the producer's response category indicating the reported likelihood of producing burley tobacco in 2007; YIELDLO =1 if the producer's yield in 2006 was less than 1,999 pounds per acre, and 0 otherwise; YIELDHI = 1 if the producer's yield in 2006 was more than 3,000 pounds per acre, and 0 otherwise; PRICELO =1 if the producer's sale price in 2005 was \$1.49/lb or less, and 0 otherwise; PRICEHI =1 if the producer's sale price in 2005 was \$1.65/lb or more, 0 otherwise; AC049 =1 if the producer's total farm acreage is 49 acres or below, and 0 otherwise; AC5099 =1 if the producer's total farm acreage is between 50 and 99 acres, and 0 otherwise; AC250MOR =1 if the producer's total farm acreage is 250 acres or more, and 0 otherwise;

Table 7: Variable Definitions, Means, and Hypothesized Effects

Format	Variable Definition	Variable	Mean	Hypothesized Effect
0-3	Lik07 (Dependent Variable)	LIK07		
#	Acres Produced in 2006	ACRES06	8.5534	+
0/1	Yield Per Acre (1,999 and below)	YIELDLO	0.1815	-
0/1	Yield Per Acre (2000 to 2,999)^a	YIELDMD	0.7789	
0/1	Yield Per Acre (3,000 or more)	YIELDHI	0.0396	+
0/1	Sale Price (\$1.49/lb and below)	PRICELO	0.0363	-
0/1	Sale Price (\$1.50 to \$1.64)^a	PRICEMD	0.8218	
0/1	Sale Price (\$1.65/lb or more)	PRICEHI	0.1419	+
0/1	Total Farm Acres (49 acres and below)	AC049	0.1716	-
0/1	Total Farm Acres (50-99 acres)	AC5099	0.1254	-
0/1	Total Farm Acres (100 to 249 acres)^a	AC100249	0.3498	
0/1	Total Farm Acres (250 acres or more)	AC250MOR	0.3531	+
0/1	Other Types of Tobacco Grown No^a	OTHRTOBN	0.8911	
0/1	Other Types of Tobacco Grown Yes	OTHRTOBY	0.1089	+
0/1	HH Shared in Tobacco Receipts 2005 (1)^a	SHAREHH1	0.6304	
0/1	HH Shared in Tobacco Receipts 2005 (2)	SHAREHH2	0.2772	+
0/1	HH Shared in Tobacco Receipts 2005 (3 or more)	SHAREHH3	0.0924	+
0/1	Gross Receipts (\$9,999 and below)	GRRECLO	0.1353	-
0/1	Gross Receipts (\$10,000 to \$99,999)^a	GRRECMD	0.6337	
0/1	Gross Receipts (\$100,000 or more)	GRRECHI	0.2310	+
0/1	Tobacco Gross Receipts (less than 10%)	TGRls10	0.1023	-
0/1	Tobacco Gross Receipts (10% to 24%)	TGR1024	0.1848	-
0/1	Tobacco Gross Receipts (25% to 49%)^a	TGR2549	0.2904	
0/1	Tobacco Gross Receipts (50% to 74%)	TGR5074	0.2244	+
0/1	Tobacco Gross Receipts (75% to 99%)	TGR7599	0.1320	+
0/1	Tobacco Gross Receipts (100%)	TGR100	0.0660	+
0/1	Age (34 or younger)	AGELO	0.0429	+
0/1	Age (35 to 64)^a	AGEMD	0.7657	
0/1	Age (65 or older)	AGEHI	0.1914	-
0/1	Household Size (1 person)	HHSIZE1	0.0660	-
0/1	Household Size (2 people)^a	HHSIZE2	0.5281	
0/1	Household Size (3 people)	HHSIZE3	0.1716	+
0/1	Household Size (4 people)	HHSIZE4	0.1683	+
0/1	Household Size (5 people or more)	HHSIZE5	0.0660	+

Table 7: Continued

Format	Variable Definition	Variable	Mean	Hypothesized Effect
0/1	Net Household Income (\$24,999 or less)	INC024K	0.1650	+
0/1	Net Household Income (\$25,000 to \$49,999)^a	INC2549K	0.3399	
0/1	Net Household Income (\$50,000 to \$74,999)	INC5074K	0.2541	-
0/1	Net Household Income (75,000 to \$99,999)	INC7599K	0.1188	-
0/1	Net Household Income (\$100,000 or more)	INC100K	0.1221	-
0/1	Occupation (Full Time Farmer)^a	FTF	0.5215	
0/1	Occupation (employed full time off farm)	FTOFF	0.2475	-
0/1	Occupation (employed part time off farm)	PTOFF	0.1254	-
0/1	Occupation (retired)	RETIRED	0.1056	-
0/1	Education (Some high school/no formal education)	NOEDUC	0.1485	-
0/1	Education (completed high school)^a	HS	0.4455	
0/1	Education (Some college/completed college)	COLLEGE	0.3432	+
0/1	Education (Graduate/Professional Degree)	GRAD	0.0627	+
0/1	Contract (Yes)^a	CONTYES	0.0858	
0/1	Contract (No)	CONTNO	0.9142	-
0/1	State (TN)^a	STATE1	0.7426	
0/1	State (NC)	STATE2	0.0891	-
0/1	State (VA)	STATE3	0.1551	+

^adenotes reference category

OTHRTOBY = 1 if the producer grew another type of tobacco besides burley, and 0 otherwise; SHAREHH2 = 1 if two households shared in the tobacco receipts, and 0 otherwise; SHAREHH3 = 1 if three households or more share in the tobacco receipts, and 0 otherwise; GRRECLO = 1 if the producer's gross agricultural receipts were \$9,999 or below, and 0 otherwise; GRRECHI = 1 if the producer's gross agricultural receipts were \$100,000 or more, and 0 otherwise; TGRLS10 = 1 if the producer's gross receipts from tobacco were 10 percent of total gross agricultural receipts or less, and 0 otherwise; TGR1024 = 1 if the producers gross receipts from tobacco were 10 percent to 24 percent of total gross agricultural receipts, and 0 otherwise; TGR5074 = 1 if the producers gross receipts from tobacco were 50 percent to 74 percent of total gross agricultural receipts, and 0 otherwise; TGR7599 = 1 if the producers gross receipts from tobacco were 75 percent to 99 percent of total gross agricultural receipts, and 0 otherwise; TGR100 = 1 if the producers gross receipts from tobacco were 100 percent of total gross agricultural receipts, and 0 otherwise; AGELO = 1 if the producers is 34 years old or younger, and 0 otherwise; AGEHI = 1 if the producer is 65 years old or older, and 0 otherwise; HHSIZE1 = 1 if the size of the household is one person, and 0 otherwise; HHSIZE3 = 1 if the household size is three people, and 0 otherwise; HHSIZE4 = 1 if the household size is four people, and 0 otherwise; HHSIZE5 = 1 if the household size is five people or greater, and 0 otherwise; INC024K = 1 if the producer's total household income was \$24,999 or less in 2005, and 0 otherwise; INC5074K = 1 if the producer's total household income was \$50,000 to \$74,999 in 2005, and 0 otherwise; INC7599K = 1 if the producer's total household income was \$75,000 to \$99,999 in 2005, and 0 otherwise; INC100K = 1 if the producer's total household income was \$100,000 or more, and 0 otherwise; FTOFF = 1 if

the producer is employed full time off the farm, and 0 otherwise; PTOFF =1 if the producer is employed part time off the farm, and 0 otherwise; RETIRED =1 if the producer is retired, and 0 otherwise; NOEDUC =1 if the producer did not complete high school, and 0 otherwise; COLLEGE =1 if the producer completed some college or attained a four-year degree, and 0 otherwise; GRAD =1 if the producer completed a graduate or professional degree, and 0 otherwise; CONTNO =1 if the producer did not have a marketing contract for his/her 2006 crop, and 0 otherwise; STATE2 =1 if the producer's primary farming operation is in North Carolina, and 0 otherwise; STATE3 =1 if the producer's primary farming operation is in Virginia, and 0 otherwise. β_0 through β_{37} are parameters to be estimated, ε is an error term representing the logistic distribution and i is a subscript representing the i^{th} farmer (Torbett et al., 2007).

Empirical Model

Though the original answer selection choice for the likelihood of producing burley tobacco in 2007 was a range from 1 to 5, the responses were transformed from 0 to 3 to agree with the logit model format and to combine the producers who indicated they were definitely not or probably not producing tobacco in 2007 into one response category. If the respondent selected 1 (*definitely still producing*), the recoded value is now 3. If the respondent selected 2 (*probably still producing*), the recoded value is now 2. If the respondent chose 3 (*not sure yet*) the recoded value is now 1. If the respondent chose 4 (*probably not producing*) or 5 (*definitely not producing*) the recoded value is now 0. For this study, the analysis is limited to those respondents who indicated that they are still actively producing tobacco in 2006. In the decision of whether or not to produce

burley tobacco in 2007, the data had 62 responses with Lik07= 3, 163 responses with Lik07=2, 132 responses with Lik07=1 and 17 responses with Lik07=0.

Most of the answer selections for the variables of interest were combined into groups due to the low number of responses in some of the answer choice categories. Instead of using all eight answer choices for yield per acre expected in 2006, the answer choices were combined into three groups. The first group, YIELDLO, included the answer selections *less than 1,750* and *1,750 to 1,999*. The second group, YIELDMD, included the answer selections *2,000 to 2,249*; *2,250 to 2,499*; *2,500 to 2,749*; and *2,750 to 2,999*. YIELDHI, the third group, included answer selections *3,000 to 3,249* and *more than 3,250*.

Average sale price received for 2005 crop was combined into three groups. The first group, PRICELO, included the following price categories: *less than \$1.35/lb*, *\$1.35/lb to \$1.39/lb*, *\$1.40/lb to \$1.44/lb*, and *\$1.45/lb to \$1.49/lb*. PRICEMD, the second price group, included the price ranges *\$1.50/lb to \$1.54/lb*, *\$1.55/lb to \$1.59/lb*, and *\$1.60/lb to \$1.64/lb*. The third price group, PRICEHI, included *\$1.65/lb to \$1.69/lb*, *\$1.70/lb to \$1.74/lb*, and *\$1.75/lb or more*. Total acreage comprising the farming operation was combined into four groups. The first group, AC049, represents *less than 10 acres*, *10 to 24 acres*, and *25 to 49 acres*. The second group, AC5099, includes *50 to 74 acres* and *75 to 99 acres*. The third group, AC100249, is comprised of the answer choices *100 to 149 acres*, *150 to 199 acres*, and *200 to 249 acres*. The final group, AC250MOR, contains the *250 to 500 acres* and the *more than 500 acres* answer choices.

Respondents were asked if they grew any other crop or livestock enterprises on their farms. Of the answer choices, three of them included other types of tobacco: dark-

fired, dark air-cured and flue-cured. The responses to those three individual answer choices were grouped into two newly created variables referred to as “Other Tobacco” or OTHRTOBN and OTHRTOBY. Producers who grew other types of tobacco are assigned a positive value (1) for the OTHRTOBY variable and producers who did not grow other types of tobacco are assigned a positive value (1) for the OTHRTOBN variable. The number of households that share in the tobacco receipts was divided into three groups. SHAREHH1 includes those that share their tobacco receipts with only *1 household*. SHAREHH2 includes those that share their tobacco receipts with *2 households*, and SHAREHH3 includes those that share their tobacco receipts with *3 or more households*.

The answer choices for gross agricultural receipts of the total farming operation in 2005 were combined into three groups. The first group, GRRECLO, includes *less than \$1,000* in gross receipts, *\$1,000 to \$4,999* in gross receipts, and *\$5,000 to \$9,999* in gross receipts. Group 2, GRRECMD, includes *\$10,000 to \$24,999* in gross receipts, *\$25,000 to \$49,999* in gross receipts and *\$50,000 to \$99,999* in gross receipts. The final group, GRRECHI, contains those gross agricultural receipts valued at \$100,000 or more: *\$100,000 to \$199,999; \$200,000 to \$299,999; \$300,000 to \$399,999; \$400,000 to \$499,999; and \$500,000 or more*.

The answer choices for the total gross farm receipts from tobacco variable were grouped as follows. Group 1, TGRLS10, includes the *less than 10 percent* and *none* answer choices. TGR1024 includes those *10 percent to 24 percent*, TGR2549 includes *25 percent to 49 percent*, TGR5074 includes *50 percent to 74 percent*, TGR7599 includes *75 percent to 99 percent*, and TGR100 includes *100 percent* of total gross farm receipts from tobacco. The age of the primary decision maker was divided into three groups. AGELO

represents those farmers that are *younger than 25* or *25 to 34* in age. AGEMD represents those farmers that are *35 to 44*, *45 to 54*, or *55 to 64* in age. AGEHI represents those farmers that are *75 to 84* or *85 or older*.

There was only one grouping of answer choices for the size of the household variable. For households ranging from 1 to 4 people, those categories remained individual and were named according to the answer selection (i.e. HHSIZE1, HHSIZE2, etc.). For those respondents that had more than 5 persons per household, they were grouped into the HHSIZE5 category. This group includes those that indicated their household comprised of 5, 6, 7 or *8 or more* members. The answer choices for the 2005 net household income variable were divided into 5 groups. Group 1, INC024K, includes those that made *less than \$10,000* or *\$10,000 to \$24,999*. INC2549K includes those that made *\$25,000 to \$49,999*; INC5074K includes those that made *\$50,000 to \$74,999*; INC7599K represents those that made *\$75,000 to \$99,999* in 2005; and INC100K represents those who made *\$100,000 or more*.

The occupation variable did not have any combinations and each answer selection represented its own individual group. FTF includes those that are *full-time farmers*, FTOFF includes those who are *employed full-time off the farm*, PTOFF includes those that are *employed part-time off the farm*, and RETIRED represents those that are *retired*. The answer choices for the education variable were divided into four groups. The first group, NOEDUC, consists of those that had *no formal education* or only completed *some high school*. The second group, HS, includes those that *completed high school*. COLLEGE, the third group, consists of those that completed *some college* or *completed a 4-year college degree*. The final category, GRAD, includes those that *completed a*

professional or graduate degree. The marketing contract variable was divided into two categories. CONTNO represents those producers who *did not have a marketing contract in place for 2006* and CONTYES represents those producers that *did have a marketing contract in place for 2006*.

The states that are included in this study were divided into four groups. STATE1 represents producers from *Tennessee*, STATE2 represents producers from *North Carolina* and STATE3 represents those producers from *Virginia*. STATE4 represents those producers from *Kentucky*. The amount of burley acres produced in 2006, ACRES06, is also a variable of interest, but the responses are continuous instead of categorical, as respondents reported their 2006 burley acreage amount instead of choosing from a range of answers.

While estimating the model, one of the answer selection groups was dropped from each variable of interest and used as a reference category. This procedure was added to decrease the chances of multicollinearity among the regressor variables. Another reason for the procedure was to allow for comparison among the answer selection groups and to test if they were significantly different from the reference category. The reference categories were chosen after completing a frequency distribution, and generally, the answer selection group containing the most responses became the reference category for that variable.

For yield per acre in 2006, the reference category is YIELDMD. For the average sale price in 2005, the reference category is PRICEMD. For total acreage of farming operation, the reference category is AC100249. For other types of tobacco grown, OTHRTOBY is the reference category. The reference category for the number of

households that shared in the tobacco receipts is SHAREHH1. The reference category for gross agricultural receipts for the total farming operation in 2005 is GRRECMD. For total gross farm receipts from tobacco, the reference category is TGR2549. The reference category is AGEMD for the age of the producer. For household size, the reference category is HHSIZE2. The reference category for net household income in 2005 is INC2549K. The reference category for occupation is FTF, and for education, the reference category is HS. The reference category for whether or not they had a marketing contract in CONTNO, and the reference categories for the states are STATE1 and STATE4. Both STATE1 and STATE4 are included because there were so few responses for STATE4 (Kentucky) and Kentucky is not included in the case study area. The amount of burley acres produced in 2006, ACRES06, did not require the use of reference categories since it is a continuous variable.

Hypothesized Effects

As described previously, the tobacco production industry is subject to a significantly higher level of market risk and uncertainty following passage of the tobacco buyout. As indicated, it is highly likely that at least half of the burley tobacco producers have exited production since the buyout. There are some farmers, however, who have continued to produce amidst the changes. It is hypothesized that among farmers who produced burley tobacco in 2006, those with higher acreages of burley tobacco production are more likely to produce burley tobacco in 2007. Individuals with larger burley acreage are expected to have more investments in tobacco equipment and barns and tobacco-specific resources and expertise that may influence their decision to remain

in their current production enterprises. For this reason, the parameter for acres, β_1 , is expected to be positive.

Higher yields are favorable in tobacco farming, increasing the profitability of the tobacco enterprise. If a producer has lower yields in burley tobacco, he or she may not be willing to continue to produce tobacco in the future, especially as profit margins decline given the sharply lower market prices. If a farmer had a higher expected yield per acre for 2006, it is hypothesized that he or she will continue production in 2007. For the expected yield per acre in 2006, β_2 is expected to be negative and β_3 is expected to be positive.

The first crop year after the buyout's inception was crucial in determining the impacts the buyout had on the tobacco industry. Several sources have indicated that tight profit margins in the post-buyout industry are influencing farmers' decisions to remain in production. Though sales prices declined greatly in the post-buyout era, the farmers that received higher sales prices likely also received higher profits. Given two years of post-buyout market price information, variation in 2005 prices is assumed to proxy for variation in price expectations. If a producer had a higher expected sales price, it is hypothesized that the farmer will be more likely to continue to produce in subsequent years. The parameter β_4 is expected to be negative and β_5 is expected to be positive.

Producers who have larger farms usually also have higher levels of capital, labor and other resources related to managing a farming operation. Smaller farms are hypothesized to lack a sufficient amount of those resources and may be less eager to produce burley tobacco in the post-buyout market. Since the burley tobacco industry is functioning under uncertainty, smaller farms may not be as eager to produce the crop

within their farming operations. The total farm size is expected to have a negative impact through the parameters β_6 and β_7 , while β_8 is expected to be positive.

The variable indicating whether or not the farmer grows other types of tobacco on his farm is a market incentive variable indicating tobacco-specific infrastructure in place that may make the individual more likely to produce burley tobacco in the future. It is hypothesized that farmers who grow other types of tobacco in addition to burley (primarily dark-fired tobacco and dark air-cured tobacco in these traditional burley regions of Tennessee, Virginia, and North Carolina) may have additional investments in equipment, barns, greenhouses or other infrastructure for producing tobacco that would influence their decision to continue to produce burley (Tiller and Jones). Thus, the parameter for farmers who also grew another type of tobacco on their farms, β_9 , is expected to be positive.

The number of households that share in the tobacco receipts is indicative of how the money received for the crop is to be divided, and also gives a measure of obligation to the burley crop. The most common arrangements for sharing tobacco receipts in these regions are familial in nature (e.g., father-son, brother-brother, etc.) Farmers that share their tobacco receipts with other households may be more likely to continue production, perhaps feeling obligated to continue production since his decision to exit would significantly affect at least another household as well. Since the producer's own household is not the only one that is dependent upon any income received for producing burley, it is likely that he or she may be more hesitant to exit. For this reason, β_{10} and β_{11} are expected to be positive.

Total gross agricultural receipts reflect all income received for a farming operation before expenses are subtracted. These receipts include money received from all crops or livestock sold, direct government payments, and revenue received from using farming equipment for custom field work on other farming operations. The percentage of total gross agricultural receipts from tobacco depicts how much of an impact tobacco had on total revenue. Producers who have higher amounts of gross agricultural receipts are likely to have more resources and additional means of income on their farming operation. It is hypothesized that farmers with higher amounts of gross agricultural receipts are more likely to continue production in 2007 than those farmers who have lower amounts of gross agricultural receipts. If a large percentage of the total gross agricultural receipts are from tobacco, the producer may be more likely to continue production. For the percentage of gross agricultural receipts, β_{12} is expected to be negative and β_{13} is expected to be positive. For gross agricultural receipts from tobacco, β_{14} and β_{15} are expected to be negative while β_{16} , β_{17} , and β_{18} are expected to be positive.

The age of the producer is hypothesized to be a major factor in future production decisions. Younger farmers are typically less risk averse and have a longer planning time horizon, and thus are believed to be more likely to continue production in 2007 while older farmers may be more likely to exit production. The parameter β_{19} is expected to be positive and β_{20} is expected to be negative.

Producers who have larger households may also have more household help in managing the daily farming operations. Given that tobacco production is highly labor intensive, larger households may be better positioned to produce a crop using household labor. The larger the household, the more likely a producer is predicted to continue

production. Several farms are family enterprises, which may be an incentive to continue production as part of a family tradition. Thus, β_{21} is expected to be negative while β_{22} , β_{23} , and β_{24} are expected to be positive.

The net household income is expected to be a major factor in future production decisions. With the burley industry facing new challenges and undergoing changes, the profitability of the industry is not as predictable, or believed to be as high in many cases. According to Chang and Boisvert, for at least the past half century, the dependence of farm households in the U.S. on income from non-farm sources has increased steadily, ultimately narrowing the income gap between farm and non-farm households. Income from off-farm work is estimated to be well over twice the amount of net income from farming (Chang and Boisvert). According to Fernando-Cornejo, off farm income now constitutes the largest component of farm household income. How farm operators allocated their time largely affects household production decisions (Fernando-Cornejo et al.). Burley tobacco is a labor intensive crop, and producers would need to have ample time for production. With off farm income being on the rise and time having an effect on production decisions, it is hypothesized that the higher the net household income, the less likely a farmer is to produce. The coefficient β_{25} is expected to be positive while β_{26} , β_{27} , and β_{28} are expected to be negative.

The occupation of the producer is a measure of time availability. Producers who are full-time farmers may continue to produce in 2007 because they currently devote most of their time to farming. Producers who work full-time off the farm are hypothesized to be less likely to continue production because most of their time is devoted to off-farm activities and tobacco is labor intensive. Producers who work part-

time off the farm are hypothesized to be less likely to continue production because a good portion of their time is allocated to off-farm activities. Producers who are retired are predicted to be less likely to continue production because they are retired and might be less physically able to perform the strenuous manual labor required in tobacco production. The parameters β_{29} , β_{30} , and β_{31} are expected to be negative.

The education level of producers is expected to be a contributing factor in future production decisions. It is hypothesized that more educated farmers might be better informed about profit potential and tools or techniques to improve management or reduce risk. Thus, β_{32} is expected to be negative, but β_{33} and β_{34} are expected to be positive.

A marketing contract is indicative of market availability for producers, especially important given the absence of any government provided safety net for tobacco farmers in the post-buyout free market. Farmers who have a marketing contract have more options in terms of marketing the burley leaf and have added protections. Though it is possible to still market the leaf without a contract, it may be more challenging and certainly involves additional market risk. Producers who do not have a marketing contract in 2006 are hypothesized to be less likely to continue production in 2007, with β_{35} expected to be negative.

In 1999, the Golden LEAF Foundation was created to provide economic assistance to tobacco dependent communities in North Carolina as a result of the Master Settlement Agreement. The goal of the non-profit foundation is to help citizens of North Carolina make the transition from a tobacco dependent economy through grants and investments that will positively impact the long-term economy of the state (Golden LEAF). Although burley tobacco production has increased in some non-traditional areas,

it is hypothesized that producers in traditional burley regions of North Carolina—where significant investments in transitioning away from tobacco income have been made—are less likely to continue production in 2007. Tobacco is the largest cash crop for the state of Virginia with Virginia ranking fourth in the U.S. in tobacco production. Although burley tobacco production has decreased since the buyout, Virginia is still a dominant force in overall tobacco production. The parameter β_{36} is expected to be negative and β_{37} is expected to be positive.

Descriptive Statistics

Tennessee

Since the analysis was limited to producers who confirmed that they produced burley tobacco in 2006, the number of observations decreased from 813 to 374. Of the 374 producers, 265 were from the state of Tennessee. Table 8 shows the descriptive statistics of important variables from the survey for Tennessee. The 2006 average burley acreage in Tennessee was about 9 acres with roughly 60 percent of producers in Tennessee indicating that they probably will or definitely will continue production in 2007. About 36 percent of the Tennessee sample is undecided about their 2007 production decision. Farmers were asked to determine what they considered to be the biggest challenges facing tobacco farmers in the next 2-5 years. Close to 76 percent of producers indicated that Labor (increasing costs of hiring labor and shortage of affordable and/or legal labor) would be a major challenge in the next 2-5 years. Price (contract prices are too low) was the second most important challenge among Tennessee producers. Sixty eight percent of producers believe that contract prices will be a challenge in the next 2-5 years. Production costs (increasing costs of nitrogen fertilizer

Table 8: Descriptive Statistics – TN

Acres (n=265)	<i>acres</i>	<i>n</i>
ACRES06	9.00	265
Lik07 (n=265)	<i>Freq</i>	<i>%</i>
Exiting	12	4.53%
Undecided	95	35.85%
Probably Producing	109	41.13%
Producing	49	18.49%
Challenges (n=260)	<i>Freq</i>	<i>%</i>
Labor	197	75.77%
Production Cost	169	65.00%
Price	178	68.46%
Contract Risk	30	11.54%
Land	27	10.38%
Price (n=254)	<i>Freq</i>	<i>%</i>
PRICELO	12	4.72%
PRICEMD	206	81.10%
PRICEHI	36	14.17%
Contract (n=265)	<i>Freq</i>	<i>%</i>
CONTYES	254	95.85%
Farm Size (n=262)	<i>Freq</i>	<i>%</i>
AC049	49	18.70%
AC5099	36	13.74%
AC100249	88	33.59%
AC250MOR	89	33.97%
Age (n=263)	<i>Freq</i>	<i>%</i>
AGELO	9	3.42%
AGEMD	197	74.90%
AGEHI	57	21.67%

Table 8: Continued

Income (n=246)	<i>Freq</i>	<i>%</i>
INC024K	48	19.51%
INC2549K	78	31.71%
INC5074K	62	25.20%
INC7599K	25	10.16%
INC100K	33	13.41%
Occupation (n=264)		
FTF	132	50.00%
FTOFF	65	24.62%
PTOFF	36	13.64%
RETIRED	31	11.74%
Education (n=264)		
NOEDUC	38	14.39%
HS	125	47.35%
COLLEGE	87	32.95%
GRAD	14	5.30%

and increasing costs of other inputs) was also a major factor among Tennessee producers with 65 percent indicating that production costs would be a challenge in the upcoming years. Contract risk (contractors exerting too much control over production) and Land (availability of quality land) were considered challenges, but for only a small portion of the Tennessee respondents.

The average sale price received for the 2005 burley crop in Tennessee was dominant in the PRICEMD category. PRICEMD includes prices ranging from \$1.50/lb to \$1.64/lb. Eighty-one percent of Tennessee producers indicated that their sale price in 2005 fell within this range. Though farm sizes of 100 acres or more were more frequent, there were also a good number of smaller farms in Tennessee. Almost all Tennessee producers received a marketing contract for their 2006 burley crop.

About 57 percent of farmers reported between \$25,000 and \$74,999 in net household income with full time farmer being the primary occupation of 50 percent of

producers in Tennessee. Close to 25 percent of producers are employed full time off the farm. The most frequent level of education completed is high school for 47 percent of producers, and 33 percent of producers indicated that they have completed at least some college level education.

North Carolina

Table 9 presents descriptive statistics of important variables from the survey for North Carolina. Of the 374 producers, 34 were from the state of North Carolina with average burley acreage in 2006 being 7.48 acres. Fifty-three percent of producers in the state were undecided about their future production decision while 35 percent indicated that they would probably still produce in 2007. Among the challenges being faced in the next 2-5 years, labor, production costs, and price were all important to North Carolina producers. Fifty-nine percent stated that labor and price were big challenges and 56 percent stated that production costs was among the biggest challenges facing farmers over the next few years. Though contact risk and availability of quality land were considered challenges, only a few respondents from North Carolina stated the two among their biggest challenges. Eighty-four percent of farmers reported average sale price in 2005 was in the PRICEMD category while 50 percent of farmers stated that they received a marketing contract for their 2006 burley crop. Forty-two percent reported that their farm size was 49 acres or less. Sixty-eight percent of farmers in North Carolina are in the AGEMD category, with ages ranging from 35 to 64. Thirty-eight percent of respondents ranged between \$25,000 and \$49,999 in net household income. The major occupation for respondents from North Carolina is full time farmer, and 76 percent of producers have completed high school or attained at least some college level education.

Table 9: Descriptive Statistics - NC

Price (n=32)	<i>Freq</i>	<i>%</i>
PRICELO	1	3.13%
PRICEMD	27	84.38%
PRICEHI	4	12.50%
Contract (n=34)	<i>Freq</i>	<i>%</i>
CONTYES	17	50.00%
Farm Size (n=33)	<i>Freq</i>	<i>%</i>
AC049	14	42.42%
AC5099	2	6.06%
AC100249	9	27.27%
AC250MOR	8	24.24%
Age (n=34)	<i>Freq</i>	<i>%</i>
AGELO	2	5.88%
AGEMD	23	67.65%
AGEHI	9	26.47%
Income (n=32)	<i>Freq</i>	<i>%</i>
INC024K	5	15.63%
INC2549K	12	37.50%
INC5074K	7	21.88%
INC7599K	6	18.75%
INC100K	2	6.25%
Occupation (n=34)	<i>Freq</i>	<i>%</i>
FTF	18	52.94%
FTOFF	6	17.65%
PTOFF	2	5.88%
RETIRED	8	23.53%
Education (n=34)	<i>Freq</i>	<i>%</i>
NOEDUC	3	8.82%
HS	12	35.29%
COLLEGE	14	41.18%
GRAD	5	14.71%

Table 9: Continued

Acres (n=34)	<i>acres</i>	<i>n</i>
ACRES06	7.48	34
Lik07 (n=34)	<i>Freq</i>	<i>%</i>
Exiting	2	5.88%
Undecided	18	52.94%
Probably Producing	12	35.29%
Producing	2	5.88%
Challenges (n=34)	<i>Freq</i>	<i>%</i>
Labor	20	58.82%
Production Cost	19	55.88%
Price	20	58.82%
Contract Risk	5	14.71%
Land	4	11.76%

Virginia

Table 10 presents descriptive statistics of important variables from the survey for Virginia. Of the 374 producers, 60 were from the state of Virginia with average burley acreage in 2006 being 4.85 acres. About 57 percent of producers stated that they would probably still produce in 2007 while 27 percent are undecided about their production decision. The biggest challenges for Virginia farmers mirror that of Tennessee and North Carolina farmers with labor, production costs, and price being the three major factors. Seventy percent of Virginia farmers feel that labor ranks among their biggest challenges over the next 2 to 5 years. Sixty-eight percent of producers feel that high production costs are among the biggest challenges while 65 percent believe that price is among the biggest challenges that burley tobacco will face. Eighty-five percent of farmers' average market sale prices are between \$1.50/lb and \$1.64/lb, while 87 percent of producers had a marketing contract for their 2006 burley crop. Farm size in Virginia is between 100 to 249 acres for 44 percent of producers, and 69 percent of producers are between the ages

Table 10: Descriptive Statistics - VA

Acres (n=59)	<i>acres</i>	<i>n</i>
ACRES06	4.85	59
Lik07 (n=60)	<i>Freq</i>	<i>%</i>
Exiting	2	3.33%
Undecided	16	26.67%
Probably Producing	34	56.67%
Producing	8	13.33%
Challenges (n=60)	<i>Freq</i>	<i>%</i>
Labor	42	70.00%
Production Cost	41	68.33%
Price	39	65.00%
Contract Risk	11	18.33%
Land	1	1.67%
Price (n=59)	<i>Freq</i>	<i>%</i>
PRICELO	1	1.69%
PRICEMD	50	84.75%
PRICEHI	8	13.56%
Contract (n=60)	<i>Freq</i>	<i>%</i>
CONTYES	52	86.67%
Farm Size (n=59)	<i>Freq</i>	<i>%</i>
AC049	9	15.25%
AC5099	7	11.86%
AC100249	26	44.07%
AC250MOR	17	28.81%
Age (n=59)	<i>Freq</i>	<i>%</i>
AGELO	4	6.78%
AGEMD	41	69.49%
AGEHI	14	23.73%

Table 10: Continued

Income (n=56)	<i>Freq</i>	<i>%</i>
INC024K	10	17.86%
INC2549K	21	37.50%
INC5074K	13	23.21%
INC7599K	7	12.50%
INC100K	5	8.93%
Occupation (n=59)		
FTF	27	45.76%
FTOFF	15	25.42%
PTOFF	7	11.86%
RETIRED	10	16.95%
Education (n=59)		
NOEDUC	18	30.51%
HS	21	35.59%
COLLEGE	15	25.42%
GRAD	5	8.47%

of 35 and 64. Eighteen percent of producers earned less than \$24,999 in net household income in 2005 while 38 percent reported between \$25,000 and \$49,999. The most common occupation among producers in Virginia is full time farmer, with 46 percent indicating full time farmer as their primary occupation. About thirty-six percent of producers in Virginia have at least completed high school.

Production Category

The trends in variables considered in the state-by-state analysis are similar in direction and magnitude when examining variables according to individual categories of future production likelihood (Producing, Probably Producing, Undecided, Exiting). Approximately 43.6 percent of producers stated that they would probably still produce burley tobacco in 2007 with 35 percent stating they were undecided about their production decision. Seventeen percent of producers indicated that they were definitely still producing in 2007 and about 5 percent plan to exit production. The majority of

producers received a marketing contract for their 2006 burley crop, regardless of their production intention in 2007. Over 90 percent of respondents in both the producing and probably producing category received a marketing contract, while a little under 90 percent, about 88 percent for both exiting and undecided, received a marketing contract. Labor, production costs, and price were among the three biggest challenges believed to be faced by producers over the next 2-5 years for all production categories. The majority of producers received prices within the \$1.50/lb to \$1.64/lb, and most of them are between 35 to 64 years old across all production likelihood categories.

Producers in the probably producing and definitely producing categories have relatively larger farms. Thirty-six percent of farmers have farms with 250 acres or more in the probably producing category while roughly 43 percent of producers in the definitely producing category have farms that are 250 acres or larger. Close to 37 percent of producers in the probably producing category, and 33 percent of producers in the definitely still producing category, reported that they earned between \$25,999 and \$49,999 in net household income. Twenty-five percent of producers in the exiting category earned less than \$24,999 in net household income. The most common primary occupation among all production likelihood categories is full time farmer. Twenty-five percent of producers that indicated they plan to exit production have no formal education while 45 percent of producers that are definitely planning to continue production in 2007 have completed high school. The modal household size is two people among all production categories.

Geographical Distribution

There were many counties that reported small amounts of acreage produced in 2006. As shown in Figure 1, burley tobacco production in Tennessee is dominant in the far northeastern and central portions of the state. West Tennessee is not a production region for burley tobacco as indicated on the map. Production is heavily concentrated in northern areas of the state with Hawkins, Hamblen, Claiborne, Pickett, Macon, Sumner, Robertson and Montgomery counties being among the counties reporting the highest level of burley acreage. Macon County has been the highest producing burley county in Tennessee since 2000 (NASS) and it was also the county with the highest average acreage from this survey (31 acres). The largest number of survey responses came from Greene County (24 responses) followed by Robertson County (23 responses) and Macon County (22 responses), but the highest average acreage was reported from Macon County, followed by Hamblen County and Sumner County.

Responses were spread among each of the farm size categories. Though Tennessee has more farms in excess of 100 acres, about 32 percent of the respondents stated that their total farming operation was 99 acres and below. Roughly 34 percent of respondents stated that their farms are between 100 and 249 acres, while an additional 34 percent of Tennessee farms are 250 acres or above. Farms in Macon County were as small as 10 to 24 acres and as large as 500 acres or more. The average total farm acreage for the county fell in the AC100249 category, which covers farms whose acreage totaled 100 to 249 acres. Sumner County had farms from less than 10 acres to more than 500 acres, but the average total acreage was 200 to 249 acres, which is part of the AC100249 category.

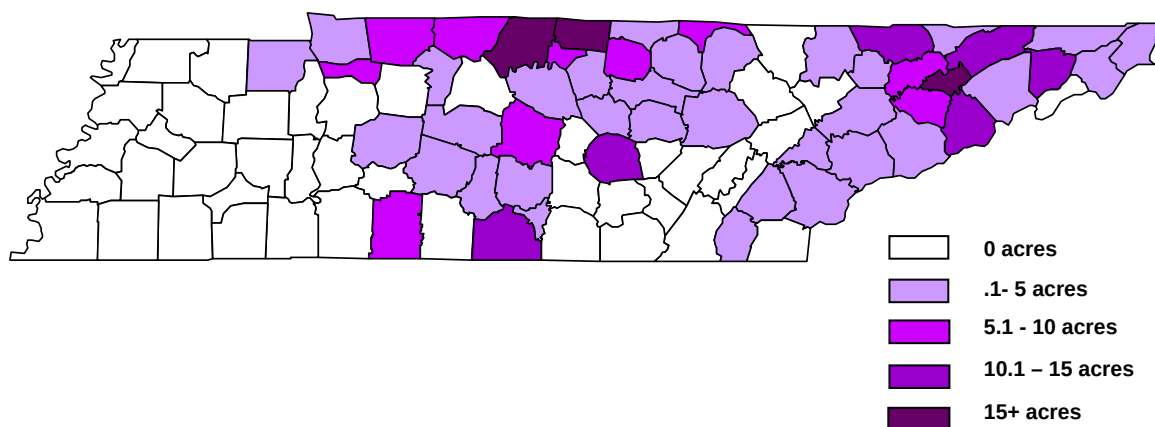


Figure 1: Tennessee – Average Burley Acreage by County in 2006

There were very few counties that reported acreage for North Carolina, all located in western North Carolina. There was no response for counties that are colored in white as show in Figure 2. Madison County has been the leading burley tobacco producing county in North Carolina since 1990 (NASS), and for the survey, the highest average acreage reported was also in Madison County (13.32 acres). Watauga County followed with 12.2 average acres reported, and Graham County had an average of 8 acres reported. The largest number of survey responses were from Madison County (9 responses) and Buncombe County (5 responses).

Overall, farms in North Carolina were larger with 51 percent of total responses indicating farm acreage over 100 acres. Of the 49 percent of farms in North Carolina that fell below 100 acres in total farm acreage, 30 percent of them were between 25 and 49 acres, or in the AC049 category. Though there were farms with less than 10 acres and more than 500 acres reported for Madison County, the average total farm acreage for the

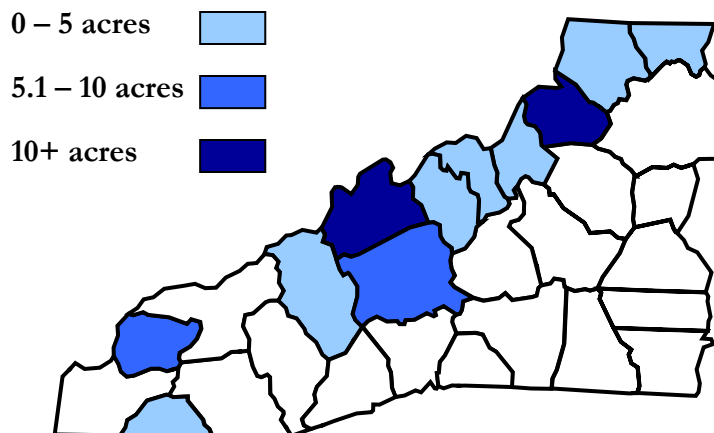


Figure 2: North Carolina – Average Burley Acreage by County in 2006

county was between 100 to 149 acres, which is the AC100249 category. The average total farm acreage for Watauga County and Haywood County was 75 to 99 acres, which falls into the AC5099 category.

Most of the responses from Virginia were from counties in the southern part of the state, so Figure 3 only shows the southern part of Virginia. Washington County led Virginia in burley tobacco production from 1990 to 2004, but Scott County became the leading burley tobacco producing county in 2005. For this survey, both Washington and Scott counties reported average burley acreage between five and six acres (5.89 and 5.18 acres, respectively), but Prince Edward County reported the highest average acreage with 8.25 acres. Floyd County had the lowest average acreage reported while both Campbell and Grayson counties had an average of six acres. Lee County was among those counties that had a large number of survey responses, with average acreage in 2006 for the county about 2.8 acres. The majority of farms in Virginia are larger in size with 73 percent of farms being larger than 100 acres.

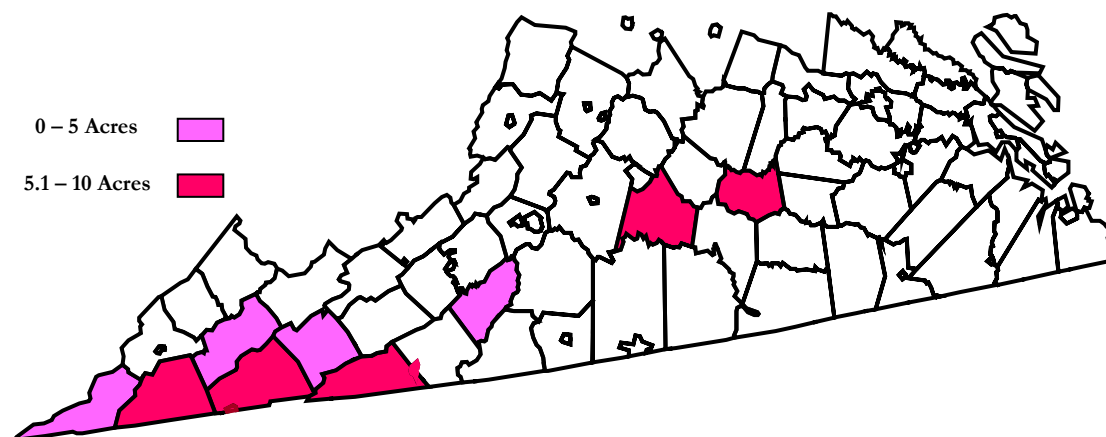


Figure 3: Virginia – Average Burley Acreage by County in 2006

The largest total farm acre category for Virginia is 250 to 500 acres, which falls into the AC250MOR category for farms that are 250 acres or more in size. The average total farm acreage for Lee County was 100 to 149 acres. Scott County also had average farm acreage of 100 to 149 acres. The smallest farm size reported for Russell and Scott counties was 25 to 49 acres, and Russell County had average total farm acreage of 200 to 249 acres. Lee, Russell, and Scott counties all fall into the AC100249 farm acreage category. Prince Edward County only had two respondents to report their farm size with the smallest being 100 to 149 acres and the largest being more than 500 acres. The average total farm acreage for the county is 200 to 249 acres, placing it in the AC100249 category. Washington County averaged 100 to 149 acres in total farm acreage.

Ordered Logit Model Results

The results of the ordered logit model are presented in Table 11. The model chi-squared statistic of 50.57 was significant at the $\alpha = 0.10$ level. To test for

Table 11: Ordered Logit Model Results

Model Statistic	Value
n	303
Log Likelihood Function	-330.6715
Restricted Log Likelihood Function	-355.9569
Chi Squared	50.57082
Degrees of Freedom	37
Model Significance	.0676941

Table 11: Continued

Format	Variable	Estimated Coefficient	Standard Error	t-ratio	Significance Level	VIF
0-3	CONSTANT	3.403	0.405	8.404	0.000	0.000
#	ACRES06	0.011	0.007	1.635	0.102	1.424
0/1	YIELDLO	0.224	0.324	0.691	0.490	1.279
0/1	YIELDMD					
0/1	YIELDHI	-0.239	0.601	-0.398	0.691	1.116
0/1	PRICELO	-0.550	0.661	-0.831	0.406	1.192
0/1	PRICEMD					
0/1	PRICEHI***	0.604	0.341	1.768	0.077	1.180
0/1	AC049	0.281	0.400	0.704	0.482	1.896
0/1	AC5099	0.468	0.401	1.166	0.244	1.423
0/1	AC100249					
0/1	AC250MOR***	0.546	0.326	1.676	0.094	1.910
0/1	OTHRTOBN					
0/1	OTHRTOBY	0.249	0.464	0.536	0.592	1.647
0/1	SHAREHH1					
0/1	SHAREHH2	-0.063	0.282	-0.225	0.822	1.284
0/1	SHAREHH3	0.043	0.421	0.101	0.919	1.194
0/1	GRRECLO*	-1.100	0.431	-2.554	0.011	1.797
0/1	GRRECMD					
0/1	GRRECHI	-0.471	0.399	-1.179	0.238	2.227
0/1	TGRls10***	0.863	0.457	1.887	0.059	1.558
0/1	TGR1024	-0.206	0.348	-0.591	0.555	1.540
0/1	TGR2549					
0/1	TGR5074	-0.005	0.324	-0.015	0.998	1.546
0/1	TGR7599	0.451	0.395	1.142	0.254	1.512
0/1	TGR100	0.069	0.557	0.125	0.901	1.508
0/1	AGELO***	1.081	0.591	1.828	0.068	1.092
0/1	AGEMD					
0/1	AGEHI	-0.408	0.347	-1.176	0.240	1.593
0/1	HHSIZE1	-0.077	0.465	-0.165	0.869	1.169
0/1	HHSIZE2					
0/1	HHSIZE3	0.136	0.345	0.394	0.694	1.291
0/1	HHSIZE4	-0.160	0.338	-0.474	0.636	1.383
0/1	HHSIZE5	0.193	0.481	0.403	0.687	1.271
0/1	INC024K	-0.498	0.351	-1.420	0.156	1.437
0/1	INC2549K					
0/1	INC5074K***	-0.538	0.326	-1.651	0.099	1.623
0/1	INC7599K	0.109	0.414	0.262	0.793	1.474

Table 11: Continued

Format	Variable	Estimated Coefficient	Standard Error	t-ratio	Significance Level	VIF
0/1	INC100K***	-0.817	0.432	-1.893	0.058	1.718
0/1	FTF					
0/1	FTOFF	-0.485	0.336	-1.445	0.149	1.712
0/1	PTOFF	-0.011	0.380	-0.030	0.976	1.390
0/1	RETIRED	0.527	0.468	1.127	0.260	1.801
0/1	NOEDUC	-0.203	0.350	-0.580	0.562	1.314
0/1	HS					
0/1	COLLEGE	0.001	0.273	0.003	0.998	1.410
0/1	GRAD**	1.020	0.523	1.950	0.051	1.261
0/1	CONTYES					
0/1	CONTNO	-0.341	0.457	-0.747	0.455	1.423
0/1	STATE1					
0/1	STATE2*	-1.136	0.466	-2.438	0.015	1.412
0/1	STATE3	0.039	0.333	-0.116	0.907	1.261

* significant at the 1% level

** significant at the 5% level

*** significant at the 10% level

multicollinearity, the variance inflation factor was inserted into the model. The variance inflation factor is a measure of multicollinearity in terms of the effect of the intercorrelation of the regressors on the variances of the least squares coefficient estimators (Greene, 2002). Some researchers have suggested that any values in excess of 10 may be problematic; however, all of the values for this model were less than 10 with the highest value being 2.227 for gross agricultural receipts in excess of \$100,000 (β_{11}), suggesting that multicollinearity is not a problem (Greene, 2002b).

The model correctly classified 53 percent of the responses. There were a total of nine significant variables at the 10 percent level or better. The marginal effects of those statistically significant variables are presented in Table 12. There are four marginal effects estimated, one for each ordinal category. The column $y=0$ represents the 'Exiting' category, $y=1$ is the 'Undecided' category, $y=2$ represents the 'Probably Producing' category and $y=3$ is the 'Producing' category.

Table 12: Marginal Effects of Significant Variables

Significant Variables			Marginal Effects			
Variable	Coefficient	Significance	y=0	y=1	y=2	y=3
PRICEHI	0.604	.0770	-.0178	-.1153	.0483	.0848
AC250MOR	0.546	.0936	-.0182	-.1073	.0556	.0700
GRRECLO	-1.099	.0107	.0583	.2095	-.1679	-.0999
TGRLS10	0.863	.0591	-.0228	-.1581	.0494	.1316
AGELO	1.081	.0675	-.0252	-.1872	.0324	.1799
INC5074K	-0.538	.0987	.0218	.1077	-.0705	-.0591
INC100K	-0.817	.0584	.0393	.1606	-.1209	-.0790
GRAD	1.019	.0512	-.0247	-.1799	.0395	.1652
STATE2	-1.135	.0148	.0639	.2126	-.1784	-.0981

The variable for higher sales prices in 2005 (PRICEHI) was positive and significant at the $\alpha = 0.10$ level (0.0770). The negative marginal effect for y=0 indicates that, compared to farmers in the reference category (PRICEMD) farmers who received a higher price for their burley crop in 2005 were less likely to fall into the lower ordinal categories (probably not or definitely not producing in 2007). The positive marginal effect for y=3 indicates that farmers who received higher prices for their burley crop in 2005 were more likely to fall into the higher ordinal category (definitely still producing in 2007), compared to producers in the reference category. The y=0 category for PRICEHI has a marginal effect value of -0.0178, meaning the producers in the higher sales price category are 1.78 percent less likely to exit production compared producers in the PRICEMD category. The y=1 column has a value of -0.1153, meaning that the producers with higher sales prices are 11.53 percent less likely to be undecided about their production decision, relative to producers in the PRICEMD category. The y=2 column has a value of 0.0483, meaning producers in the PRICEHI category are 4.83 percent more likely to be probably producing, compared to the PRICEMD category. The y=3 column has a value of 0.0848 meaning that, compared to producers in the PRICEMD category,

producers in the PRICEHI category are 8.48 percent more likely to be in the producing category. As expected, the results suggest that farmers who received higher prices for their burley tobacco crop in 2005 were more likely to indicate that they intend to continue production in 2007.

The variable for producers whose farming operations totaled 250 acres or more (AC250MOR) was positive and significant at the $\alpha = 0.10$ level (0.0936). The negative marginal effect for $y=0$ indicates that farmers who have 250 acres or more in their total farming operation were less likely to fall into the lower ordinal categories (i.e., exit tobacco production). The positive marginal effect for $y=3$ indicates that farmers who have 250 acres or more in their total farming operation were more likely to fall into the higher ordinal category (i.e., continue to produce tobacco). The $y=0$ column has a value of -0.0182, meaning that, compared to the AC100249 reference category, producers with farms in excess of 250 acres are 1.82 percent less likely to exit production. Producers with farms in excess of 250 acres are 10.73 percent less likely to be undecided about their production decision; 5.56 percent more likely to probably produce; and 7 percent more likely to produce, compared to those in the AC100249 category. The results indicate that farmers with larger farm acreage (AC250MOR) are more likely to continue production in 2007. The other variables indicating total acreage of farming operation category, AC049 and AC5099, were insignificant.

The variable for producers who have lower levels of gross agricultural receipts (GRRECLO) was negative and significant at the $\alpha = 0.01$ level (0.0107). The estimated marginal effect of $y=0$ is 0.0583, suggesting that farmers who have low gross receipts are 5.83% more likely to exit production, compared to those in the GRRECMD category.

The marginal value of $y=1$ is 0.2095, meaning that producers with low gross receipts are 20.95 percent more likely to be undecided about their production decision, compared to those in the GRRECMD category. The $y=2$ column has a value of -0.1679, suggesting that producers with low gross receipts are 16.79 percent less likely to probably produce, compared to those in the GRRECMD category. The $y=3$ column has a value of -0.0999. Compared to the GRRECMD category, producers in the GRRECLO category are 9.99 percent less likely to produce. The higher category for gross receipts (GRRECHI) was insignificant. The marginal effects suggest that the lower the gross agricultural receipts, the less likely farmers are to continue production in 2007.

The variable for gross receipts from tobacco less than 10 percent of agricultural receipts (TGRLS10) was positive and significant at the $\alpha = 0.10$ level (0.0591). The negative marginal effect for $y=0$ indicates that farmers are 2.28 percent less likely to exit production, compared to the TGR2549 category. For farmers in the TGRLS10 category, producers are 15.81 percent less likely to be undecided about their production decision compared to the TGR2549 category. Producers in the $y=2$ category are 4.94 percent more likely to probably produce while producers in the $y=3$ category are 13.16 percent more likely to produce, compared to the TGR2549 category. The other variables for gross receipts from tobacco, TGR1024, TGR5074, TGR7599, AND TGR100, were insignificant. The results suggest that producers with lower portions of gross receipts from tobacco are more likely to continue production in 2007.

The first age variable (AGELO) was positive and significant at the $\alpha = 0.10$ level (.0675). The negative marginal effect for $y=0$ indicates that farmers who are younger in age are less likely to fall into the lower ordinal categories, or exit production. The

positive marginal effect for $y=3$ indicates that farmers who are younger were more likely to fall into the higher ordinal category, or continue production. The -0.0252 value in $y=0$ suggests that younger farmers are 2.52 percent less likely to exit production, compared to those in the AGEMD category. Younger farmers are 18.72 percent less likely to be undecided about their production decision, 3.24 percent more likely to probably produce, and 17.99 percent more likely to produce, compared to those in the AGEMD category. The results suggest that younger farmers are more likely to continue production in 2007.

The variable for producers whose net household income totaled between \$50,000 and \$74,999 (INC5074K) was negative and significant at the $\alpha = 0.10$ level (.0987). Compared to the reference category of lower net household income (INC2549K), producers with higher incomes are less likely to continue to produce tobacco. The $y=0$ column has a value of 0.0218, meaning that producers with net household income between \$50,000 and \$74,999 are 2.18 percent more likely to exit production, compared to those in the INC2549K category. The $y=1$ column has a value of 0.1077, indicating that producers in the INC5074K category are 10.77 percent more likely to be undecided about their production decision, compared to those in the INC2549K category. The value of -0.0705 in the $y=2$ category suggests that producers are 7.05 percent less likely to probably produce, compared to those in the INC2549K category. Producers in the INC5074K are 5.91 percent less likely to produce, compared to the INC2549K category.

Similarly, the variable for producers whose net household income totaled \$100,000 or more (INC100K) was negative and significant at the $\alpha = 0.10$ level (.0584), also indicating that households with even higher net household income, compared to the reference category) are less likely to remain in tobacco production. The $y=0$ column has a

value of 0.0393, suggesting that farmers who made \$100,000 or more are 3.93 percent more likely to exit production, compared to those in the INC2549K category. The value of $y=1$ is 0.1606, meaning that producers who made \$100,000 or more are 16.06 percent more likely to be undecided about their production decision, compared to those in the INC2549K category. The $y=2$ column has a value of -0.1209, meaning that producers who made \$100,000 or more are 12.09 percent less likely to probably produce, compared to those in the INC2549K category. Producers who made \$100,000 or more in net household income are 7.90 percent less likely to produce, compared to those in the INC2549K category. The marginal effects suggest that as net household income increases, farmers are less likely to continue production in 2007. The other categories for the income variable, INC024K, INC5074K and INC7599K, were insignificant.

The variable for producers who have achieved at least a Master's degree (GRAD) was positive and significant at the $\alpha = 0.05$ level (.0512), meaning that producers with higher levels of education, relative to high school graduates, are more likely to continue to produce tobacco. The $y=0$ column has a value of -0.0247, meaning that producers with a graduate/professional degree are 2.47 less likely to exit production, compared to those that completed high school. Producers are 17.99 percent less likely to be undecided about their production decision, 3.95 percent more likely to probably produce, and 16.52 percent more likely to produce, compared to those that completed high school. The marginal effects for this variable indicate that farmers who have completed higher levels of education are more likely to continue production in 2007. The other variables for the education category, NOEDUC and COLLEGE, were insignificant.

The variable indicating those producers whose primary farming operation is located in North Carolina (STATE2) was negative and significant at the $\alpha = 0.01$ level (0.0148). The $y=0$ column has a value of 0.0639, meaning that producers from North Carolina are 6.39 percent more likely to exit production, relative to the reference category, which was producers located in Tennessee (STATE1). The value of $y=1$ is 0.2126, suggesting that producers from North Carolina are 21.26 percent more likely to be undecided about their production decision. The $y=2$ column has a value of -0.1784, suggesting that farmers are 17.84 less likely to probably produce. The $y=3$ column suggests that 9.81 percent of producers are less likely to produce. The marginal effects suggest that producers who are located in North Carolina are less likely to continue production in 2007, compared to producers in Tennessee.

The remaining variables in the model were insignificant, meaning they have neither a conclusively positive or negative effect on the decision to continue burley tobacco production in 2007. Among the statistically significant factors that influence the likelihood that a producer will remain in tobacco production, some variables show a stronger influence on a producer's decision than others. Among producers in the Exiting category ($y=0$), the factor with the strongest influence in placing a producer in the Exiting category is whether they are a North Carolina tobacco producer. If a tobacco producer farms in North Carolina, the probability that he or she will exit tobacco production increases by 6.4 percent. The next strongest influence is whether or not the producer is in the lowest category of gross farm receipts, where producers with GRRECLO=1 are 5.8 percent more likely to be in the Exiting ($y=0$) category. In contrast, the factors that contribute most strongly to a negative result for a producer Exiting are whether or not the

producer is in the youngest age category (AGELO=1), which makes the producer 2.5 percent less likely to be in the Exiting ($y=0$) category, and whether or not the producer has education above the college level (GRAD=1), which also makes the producer 2.5 percent less likely to be in the Exiting ($y=0$) category.

At the other end of the response scale, the factors that most strongly influence a producer's decision to definitely continue tobacco production ($y=3$) are whether or not the producer is in the lowest age category and whether or not the producer has education above some college. Producers in the lowest age category (AGELO=1) are 18 percent more likely to be in the definitely producing ($y=3$) category, and producers with some education beyond the college level (GRAD=1) are 16.5 percent more likely to be in the definitely producing ($y=3$) category. The strongest influence on the likelihood that a producer will NOT be in the definitely producing ($y=3$) category is whether the producer has gross receipts that are in the lowest category, where producers with GRRECLO=1 are 10 percent less likely to be in the definitely producing category, followed by whether or not the producer is from North Carolina (STATE2=1), which makes the producer 9.8 percent less likely to be in the definitely producing category.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Farmers who produced burley tobacco in 2006 were asked to determine their likelihood of producing burley tobacco in 2007 by selecting a response category from a set of ordered response categories. The answer selections ranged from definitely still producing to definitely not producing. Roughly 44 percent of farmer respondents who were actively growing tobacco in 2006 expect to probably still be producing in 2007. Another 35 percent are not sure about their decision to produce burley in 2007. A small percentage of farmers who produced in 2006 expect to exit production while only 17 percent expect to definitely still be producing in 2007.

The ordered logit model results show differences in what factors influence a producer to continue burley production in 2007. The results show that producers who received higher prices, had larger farms, had low tobacco gross receipts, were younger in age, or had a graduate or professional degree were more likely to continue production in 2007. Producers who had low gross agricultural receipts, higher net household incomes, or their primary farming operation was located in North Carolina were less likely to continue burley production in 2007.

Farmers who received higher prices were more likely to continue production in 2007. This finding suggests that producers who received higher prices for their crop likely reaped higher profit margins. Higher profits entice producers to continue to produce tobacco, despite higher levels of market risk in the post-buyout free market. Producers who had larger farms were more likely to continue production in 2007. This

finding suggests that producers with larger farms are more likely to produce because larger farms have more capital and resources to maintain an efficient farming operation.

In general, younger farmers are less risk averse than older farmers (Dimara and Skuras). Younger farmers may also be more willing and able to perform difficult labor tasks associated with tobacco production. The findings suggest that younger farmers are more likely to continue production. Farmers with the highest level of education (professional/graduate degree) were more likely to continue production. This may suggest that being profitable in the post-buyout tobacco industry requires higher levels of production and risk and labor management skills and more sophisticated management tools that can be gained through higher education. This finding suggests that the more education a farmer has, the more likely he/she is to continue production.

Producers who had lower amounts of gross agricultural receipts were less likely to continue production. Lower gross agricultural receipts is an indication of the overall income level for the farming operation. With relatively lower levels of farm income, a producer may be less likely to continue to engage in producing a crop that faces high levels of risk and uncertainty without any guaranteed safety net. Also, tobacco production requires significant levels of manual labor and producers with low levels of farm income may choose to allocate their labor and time to farm enterprises with lower risk. Producers with higher net household incomes are less likely to continue production. These results may suggest that higher income households are less willing to take on the risk and labor required in a post-buyout tobacco market, or that the potential returns from tobacco production are valued less at the margin as household income increases. Of the three states surveyed, North Carolina was the smallest contributor to burley production and,

accordingly, had fewer responses. But compared to other states, current burley producers in traditional growing regions of North Carolina are more likely to exit production. North Carolina's burley production decreased after the buyout, as in other states, though the traditional burley region of North Carolina has been historically characterized with yields lower than in other burley states and regions. The results suggest that a farmer whose primary farming operation is located in North Carolina is less likely to continue production in 2007. Also, given the significant investments in North Carolina over the last eight years to encourage farming alternatives to tobacco through the Golden LEAF Foundation, a higher probability of exiting among North Carolina growers is not a surprising result.

There are a number of tobacco and agriculture industry segments that can benefit from the information this research has yielded. Tobacco has traditionally been a very significant contributor to the agricultural economy in the major tobacco states. As the industry has undergone dramatic changes over the last decade or so, these states have lost significant farm income as tobacco production and revenue has declined, by up to 80 percent in some cases. As these tobacco state economies adjust to the new market dynamics for the tobacco industry, general agriculture interests are looking for information that will help them understand the outlook for tobacco production and income and how and where a new post-buyout equilibrium may settle. This research provides the first in-depth analysis of tobacco production and tobacco producer attitudes following the buyout. The tobacco industry in general (including producers, input suppliers, equipment dealers, creditors, manufacturers and leaf dealers), county Extension agents, and researchers working in this area are very interested in new information that

contributes to an understanding of how the tobacco industry has changed since the buyout, where the industry may settle, and factors that may contribute to improving the sustainability and profitability of the industry. This study provides a glimpse of the post-buyout tobacco industry, including very specific details that are not widely available since the major structural change in the tobacco production industry brought about through the buyout.

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APPENDICES

Kentucky County Ag Agents Burley Tobacco Survey (December 2005)

**(Results from 68 counties reporting, representing 76% of the 2004 quota
(Note: Results below based on weighting counties by 2004 quota levels))**

2005 Crop

1. What percentage of tobacco growers in your county would you estimate exited production in 2005? **43%**
2. Estimate the percentage change in 2005 burley acres for your county compared to 2004. **-30%**
3. Estimate the range of 2005 burley acres planted among growers in your county along with the average size per grower. **Range: 0.5 Acres to 250 Acres, Average 13.8 Acres**
4. Estimate your county's average burley yield for the 2005 crop. **2039 lbs/acre**
5. On a scale of 1 to 5, with 1 being very dissatisfied and 5 being very satisfied how would you rank the "general" feeling of burley tobacco contract growers in your county with respect to:

3.0 contract terms
3.5 relationship with receiving station operator
3.2 grading
2.3 market prices
6. What percentage of your county's 2005 burley crop would you estimate will be sold at auction this marketing season? **4.8%**
7. How many new tobacco barns/curing facilities were constructed in your county this past year? **68% of reporting counties responded 0, with only 5 counties reporting 5 or more**
8. On a scale of 1 to 5 with 1 being very difficult to 5 being not difficult, how would you assess the availability of tobacco labor for the 2005 crop. **2.3**

2006 Crop

9. Given the following range of "potential" average prices for 2006, what percentage change in the **number of burley growers** would you estimate to occur in your county for 2006 vs. 2005?

\$1.40 -51%
 \$1.50 -31%
 \$1.60 -10%
 \$1.70 +1%
 \$1.80 +16%

10. Given the following range of “potential” average prices for 2006, what percentage change in **burley tobacco acres** would you estimate to occur in your county for 2006 vs 2005?

\$1.40 -55%
 \$1.50 -25%
 \$1.60 -7%
 \$1.70 +9%
 \$1.80 +21%

11. Besides price, what other concerns do “potential” tobacco growers in your county have regarding the 2006 crop?

Labor Cost and Availability	(35%)
Fertilizer/Fuel/Other Input Prices	(15%)
2006 Grading:	(11%)
Big Bale:	(10%)
Barn/Curing Facilities	(9%)
Contract Terms	(7%)
Other (e.g. trust, disease, weather, etc)	(13%)

12. In a “normal” growing season, what would you estimate to be a reasonable average yield for burley tobacco grown in your county given the soil conditions and the management skills of your post-buyout growers? **2412 lbs/acre**

13. Estimate the range of acres planted you expect among burley growers in your county for 2006 along with the average size per grower. **Range: 0.5 to 250 Acres, Average: 16.2 Acres**

14. Does there appear to be interest among the growers in your county to participate in the Burley Tobacco Growers Infrastructure Program? **74% of responding counties indicated some positive interest – mostly limited**

Tobacco Buyout

15. What percentage of buyout recipients in your county would you estimate took the lump sum payment option for payments 2-10.? **32%**. What percent of total tobacco buyout dollars would that account for in your county? **25%**

16. What percentage of buyout recipients in your county would you estimate will take the lump sum payment option for payments 3-10, beginning in 2006? **12%**

17. Identify the top three reasons (or uses for the buyout dollars) that farmers in your county elected to take the lump sum option.

Retire Debt:	(22%)
Trust/Fear:	(16%)
Invest in Alternative Ag/Land:	(16%)
Age	(13%)
Small Amount of \$:	(11%)
Non-Ag Investments:	(10%)
Other:	(12%)

18. Identify reasons why you think farmers in your county chose NOT to take a lump sum. **Predominately for tax reasons. Other reasons included discount rates being too high, didn't need the money now, and didn't understand the lump sum option**

Highlights from the 2005-2006 KY County Agent Survey on Burley Tobacco
Will Snell, University of KY (January 2006)

Thanks to all of you who responded to my annual county agent tobacco survey. Despite a year of experience in the post buyout era, many burley tobacco farmers remain very unsure about their future participation in this industry. The increasing cost and availability of labor, escalating energy-based input prices, and 2006 price incentives have collectively dampened the enthusiasm for many burley growers. Following the distribution of the December 2005 survey, I received completed surveys from 68 Kentucky counties, representing 76% of the state's historical production base. The aggregated results were **weighted** by each county's historical production quota levels. Selected survey highlights (on a regional and statewide basis) are presented below. A copy of the entire survey along with aggregated results (Word file) or a slideshow (Powerpoint) presentation summarizing the survey results will be made available upon request via email.

2005 Crop Survey Results:

KY Crop Reporting District	Change in Growers (2005)	Change in Acres (2005)	Avg. Size (Acres) (2005)	Avg. Yield (Lbs/Acre) (2005)
Eastern	-62%	--39%	8.0	2036
Bluegrass	-47%	-37%	18.5	2016
Northern	-33%	-32%	8.8	2060
Central	-41%	-23%	8.8	2012
Midwest	-17%	-2%	22.3	2381
Purchase	-57%	-51%	14.4	2036
State	-43%	-30%	13.8	2039

2006 Crop Survey Results:

Potential Prices	\$1.50	\$1.60	\$1.70
Number of growers (KY)	-31%	-10%	+1%
Number of acres (KY)	-25%	-7%	+9%

KY Crop Reporting District	Change in Growers (2006 at \$1.60/lb)	Change in Acres (2006 at \$1.60/lb)	Avg. Size (Acres) (2006)	“Potential” Yield (Lbs/Acre)
Eastern	-2%	-2%	9.3	2262
Bluegrass	-7%	-6%	19.6	2507
Northern	-7%	-1%	11.3	2328
Central	-23%	-14%	11.9	2315
Midwest	-1%	+5%	36.8	2799
Purchase	-12%	-12%	12.0	2438
State	-10%	-7%	16.2	2412

- Besides price, what other concerns do tobacco growers in your county have regarding the 2006 crop?

Labor Cost and Availability	(35%)
Fertilizer/Fuel/Other Input Prices	(15%)
2006 Grading:	(11%)
Big Bale:	(10%)
Barn/Curing Facilities	(9%)
Contract Terms	(7%)
Other (e.g. trust, disease, weather)	(13%)

- Identify the top three reasons (or uses for the buyout dollars) that farmers in your county elected to take the lump sum option.

Retire Debt:	(22%)
Trust/Fear:	(16%)
Invest in Alternative Ag/Land:	(16%)
Age	(13%)
Small Amount of \$:	(11%)
Non-Ag Investments:	(10%)
Other:	(12%)

Personal Observations from Survey Results:

2005 Crop: The percentage of burley farmers exiting (48%) was slightly below expectations, while acreage reductions (30%) were very similar to the results obtained from the November 2004 agent survey and recent USDA crop estimates. As anticipated, the survey revealed a massive reduction in the number of tobacco growers in the Eastern region versus a much smaller percentage reduction in the Midwestern region. The average tobacco grown per Kentucky farm more than doubled – increasing from traditional levels of around 5 acres per farm to 13.8 acres per farm. Farm size varied tremendously across the state, ranging from 0.5 acres in several Eastern Kentucky counties to 250 acres on the largest Bluegrass and Midwestern Kentucky tobacco farms. The average state-wide yield of 2039 pounds per acre was considerably above the 1800 average pound yield in the last USDA crop report.

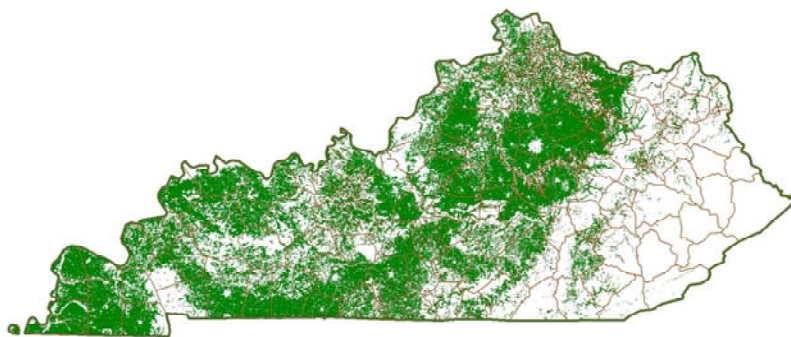
2006 Crop: Most of the surveys were returned prior to the announcement of 2006 price schedules/programs which generally indicated very little change in 2006 contract prices. While 2005 auction/contract prices have averaged between \$1.55 to \$1.60/lb, the 2006 contract price schedules will likely indicate an “expected” average price closer to \$1.55/lb for the 2006 crop. The survey results revealed that it will take an approximate 10 cent/lb increase (using \$1.55/lb as a base expected price) to keep Kentucky burley acreage constant in 2006 and an approximate 15 cent/lb increase to keep the number of growers constant. Thus, the survey results indicate another potential double-digit percentage drop in the number of Kentucky burley tobacco farms and acres for 2006. Regionally, the survey results project that concentration, following a massive exit in 2005, may tend to stabilize in Eastern Kentucky in 2006, continue, but at a slower pace in the Bluegrass region, but show another steep spiral decline in the Central Kentucky crop

reporting district. If price expectations remain relatively stable, burley acreage in the Midwestern region could actually expand in 2006. Based on the survey results, the average tobacco farm will likely continue to expand modestly in 2006, increasing to over 15 acres per farm statewide, with the biggest increase in the Midwestern region. Finally, the agents indicated that “potential” average state-wide burley yields could expand to more than 2400 pounds per acre, which under “ideal” growing conditions could offset the anticipated drop in acres and growers.

Final Thoughts: Concentration and shifts will continue to take place in the second year of the post-buyout era. Look for production to continue to shift out of the Eastern, Central, and Bluegrass regions of Kentucky into the Midwestern region. Prior to the buyout, the Eastern Kentucky region grew 10 to 15% of the state’s burley, while the Midwestern region only grew around 5 to 10%. Survey results indicate that the market share of burley production for these two regions will likely reverse during the early period of the post-buyout era (i.e. Midwestern region growing 10 to 15% of the state’s burley, with the Eastern region falling below 10%). Despite a massive decline in growers and acres, burley production in the other crop reporting districts will not likely change significantly on a market share basis. And despite a lot of attention to burley production in non-traditional areas, Kentucky is still expected to produce more than two-thirds of the nation’s burley in 2006.

By completing this confidential survey you will help our research efforts for farmers. May we contact you again in future years if we are able to repeat this survey. YES _____ NO _____

A Survey of Kentucky Farmers: The Tobacco Buyout



University of Kentucky
Department of Agricultural
Economics
400 C.E. Barnhart
Lexington, KY 40546-7290



We would like to start by asking a few questions about your farm and farming activities.

A1 **In general, how would you describe the current business climate for farmers in your area compared to last year?** (Circle the number of your answer.)

- 1 GETTING BETTER
- 2 ABOUT THE SAME
- 3 GETTING WORSE

A2 **Have you farmed in the past 3 years?** (Circle the number of your answer.)

1 NO →

2 YES



(IF YES)

IF YOU HAVE NOT FARMED IN
THE LAST 3 YEARS, SKIP TO
QUESTION C1 ON PAGE 6.

A3 **How many acres do you own?**

_____OWN

A4 **How many acres do you rent?**

_____RENT

A5 **What is the primary county where your farm is located?**

_____COUNTY

A6 **In what year did you become the primary decision maker on your farm?**

_____YEAR

A7 **Which of the farm activities listed below are you involved in?** (Circle the number for all that apply.)

- | | |
|-----------|----------------|
| 1 TOBACCO | 2 HAY |
| 3 BEEF | 4 POULTRY |
| 5 DAIRY | 6 SWINE |
| 7 HORSES | 8 VEGETABLES |
| 9 FRUITS | 10 AQUACULTURE |
| 11 GRAINS | 12 OTHER |

We would like to know about your activity growing tobacco.

B1 Have you raised tobacco in the last 3 years?

(Circle the number of your answer.)

- 1 NO → IF YOU HAVE NOT RAISED
2 YES TOBACCO IN THE LAST 3 YEARS,
SKIP TO QUESTION B4 ON PAGE 4.



B2 (If yes) How many acres of tobacco did you raise last year?

_____ACRES

B3 How many pounds of tobacco did you sell last year?

_____POUNDS

B4 Do you plan to raise tobacco in the future?

(Circle the number of your answer.)

- 1 YES
2 NO

B5 Did you receive a tobacco buyout check?

(Circle answer.)

- 1 YES
2 NO

B6 Do you expect to receive a tobacco buyout check in the future? (Circle answer.)

- 1 YES
2 NO → IF YOU HAVE NOT & WILL NOT
RECEIVE A BUYOUT CHECK, SKIP
TO QUESTION C1 ON PAGE 6.

B7 There were several payment options available for those who were to receive tobacco buyout checks. Which option did you choose? (Circle answer.)

- 1 A SINGLE LUMP SUM PAYMENT
2 TWO ANNUAL PAYMENTS PLUS A LUMP SUM
3 10 ANNUAL PAYMENTS

4 OTHER PAYMENT OPTION

B8 **What is the total dollar amount you expect to receive in tobacco buyout checks? Include all past and future tobacco buyout checks you expect to receive.**

_____ TOTAL AMOUNT

B9 **What do you plan to do with the tobacco buyout money you receive?**

(Circle the number for all that apply.)

- 1 PAY OFF DEBTS
- 2 SPEND ON USUAL HOUSEHOLD EXPENSES
- 3 PAY MEDICAL EXPENSES
- 4 RETIREMENT FUND
- 5 INVEST IN FINANCIAL ASSETS (e.g., STOCKS, BONDS, CDs, MUTUAL FUNDS)
- 6 INVEST IN EXISTING ON FARM BUSINESS ACTIVITY
- 7 INVEST IN EXISTING OFF FARM BUSINESS ACTIVITY
- 8 INVEST IN NEW ON FARM BUSINESS ACTIVITY
- 9 INVEST IN NEW OFF FARM BUSINESS ACTIVITY
- 10 SPEND ON ONE-TIME HOUSEHOLD EXPENSES
- 11 GIFTS OR CHARITY
- 12 I HAVE NOT DECIDED HOW TO USE THIS MONEY
- 13 OTHER _____

B10 **What percentage of your income came, or do you expect to come, from growing tobacco in each of the following years?**

2002 _____	2003 _____
2004 _____	2005 _____
2006 _____	2007 _____

The following questions about your community help identify characteristics about your community.

C1 **How many years have you lived in your current house or residence?**

_____ YEARS

C2 **How many years have you lived in your current community?**

_____ YEARS

C3 **Would you describe the community you live in as rural, urban or suburban?** (Circle answer.)

- 1 RURAL
- 2 URBAN
- 3 SUBURBAN

C4 **Had you or your significant other ever lived in your current community before you moved there?** (Circle answer.)

- 1 YES, THIS COMMUNITY HAD BEEN A HOME FOR ONE OR BOTH OF US BEFORE
- 2 NO, NEITHER I NOR MY SIGNIFICANT OTHER HAD LIVED IN THIS COMMUNITY BEFORE

C5 **Which of the following statements best describes the location of the previous community you lived in?** (Circle the number of your answer.)

- 1 ANOTHER COMMUNITY IN THE SAME COUNTY
- 2 ANOTHER COMMUNITY IN A DIFFERENT COUNTY BUT STILL IN KENTUCKY
- 3 ANOTHER COMMUNITY NOT IN KENTUCKY

C6 **Do you belong to any social groups in your community (e.g., religious, service, clubs, etc.)?** (Circle answer.)

- 1 YES
- 2 NO

C7 **What is the name of the closest university, college or technical college?**

_____ COLLEGE

C8 **How far is this school from your home?**

_____ MILES

Please tell us what you think about the possibility of starting a new business.

- D1 **Do you personally know people who started their own business in your community or elsewhere?** (Circle the number of your answer.)
- 1 YES
 - 2 NO
- D2 **Have you ever considered starting a new business, either full-time or part-time** (Circle answer.)
- 1 YES, FULL-TIME
 - 2 YES, PART-TIME
 - 3 NO
- D3 **Have you ever started a new business?** (Circle answer.)
- 1 YES
 - 2 NO
- D4 **Are you planning to start a new business?** (Circle answer.)
- 1 NO →
 - 2 YES ↓
- IF YOU ARE NOT PLANNING TO START A NEW BUSINESS, SKIP TO QUESTION E1 ON PAGE 9.
- D5 **What type of business do you plan to start?**
- _____TYPE
- D6 **Which steps have you taken toward starting your new business?** (Circle the number for all that apply.)
- 1 FINANCING
 - 2 MARKETING
 - 3 PRODUCTION
- D7 **If you have received or expect to receive a tobacco program buyout check, does this affect your decision whether or not to start a new business?** (Circle answer.)
- 1 YES
 - 2 NO
 - 3 I WILL NOT RECEIVE A CHECK

The following questions concern access to computer related sources of information.

- E1 **Do you have a computer at home?** (Circle the number of your answer.)

1 YES

2 NO

E2 **Do you have a webpage for your farm?** (Circle answer.)

1 YES

2 NO

E3 **Do you have internet access from other places than home? (library, friends, etc.)** (Circle answer.)

1 YES

2 NO

E4 **Do you have internet access from your home?** (Circle answer.)

1 YES

2 NO

If you answered "Yes" to either question E3 or E4 above, please continue, otherwise, skip to question F1 on the next page.

Many farmers are using the internet and e-mail for personal and business activities. For each activity listed below, please circle the year only if you used the internet in that year for the listed activity.

1 E-mail friends and family.....	2003	2004	2005
2 E-mail county agent, farm supplier or other organizations for farm or business related activity.....	2003	2004	2005
3 Purchase farm or business related items over the internet.....	2003	2004	2005
4 Sold farm or business related items over the internet.....	2003	2004	2005
5 Used the internet to perform banking or investment activity.....	2003	2004	2005
6 Print tax or other business forms or submit tax or other business forms.....	2003	2004	2005
7 Run advertisements.....	2003	2004	2005
8 Acquire information about the tobacco buyout program.....	2003	2004	2005

Finally, we would like to ask you a little about yourself.

F1 **What is your present age?**

_____ AGE

F2 **What is your sex?** (Circle the number of your answer.)

- 1 Female
 - 2 Male
- F3 **What is your race?** (Circle answer.)
- 1 WHITE/CAUCASIAN
 - 2 BLACK/AFRICAN AMERICAN
 - 2 ASIAN AMERICAN
 - 3 HISPANIC/LATINO
 - 4 NATIVE AMERICAN
 - 5 BI-RACIAL/MULTI-RACIAL
 - 6 OTHER
- F4 **What is your marital status?** (Circle answer.)
- | | |
|-------------------|-----------------|
| 1 NOW MARRIED | 2 WIDOWED |
| 3 SEPARATED | 4 DIVORCED |
| 5 LIVING TOGETHER | 6 NEVER MARRIED |
- F5 **What is your significant other's age, if applicable?**
- _____ AGE
- F6 **What is your significant other's sex, if applicable?** (Circle answer.)
- 1 Female
 - 2 Male
- F7 **What is your significant other's race, if applicable?** (Circle answer.)
- 1 WHITE/CAUCASIAN
 - 2 BLACK/AFRICAN AMERICAN
 - 2 ASIAN AMERICAN
 - 3 HISPANIC/LATINO
 - 4 NATIVE AMERICAN
 - 5 BI-RACIAL/MULTI-RACIAL
 - 6 OTHER
- F8 **What is your current household income?** (Circle answer.)
- 1 ZERO TO \$\$29,999
 - 2 \$30,000 TO \$79,999
 - 3 \$80,000 TO \$119.999
 - 4 MORE THAN \$120,000

F9 **What is the employment status for you and your significant other, if applicable?** (Circle number of one choice in each column.)

YOU	SIGNIFICANT OTHER	
1	1	EMPLOYED FULL-TIME
2	2	EMPLOYED PART-TIME
3	3	EMPLOYED TEMPORARILY
4	4	UNEMPLOYED
5	5	RETIRED
6	6	IN SCHOOL

F10 **Are you or your significant other, if applicable, currently employed on your farm?**

(Circle number of one choice in each column.)

YOU	SIGNIFICANT OTHER	
1	1	FULL-TIME ON FARM
2	2	PART-TIME ON FARM
3	3	<u>NOT</u> EMPLOYED ON FARM

F11 **Have you changed employment in the last two years?** (Circle the number of your answer.)

- 1 YES
- 2 NO

F12 **Are you considering a future change in employment?** (Circle answer.)

- 1 YES
- 2 NO

F13 **How many children under 18 currently live at home?**

_____ CHILDREN

F14 **How many additional family members, other than the children included in your answer to the previous question, live in your home?**

_____ OTHER FAMILY MEMBERS

F15 **Of the children and family members who live with you, how many work at least part-time on your farm, if applicable?**

_____ WORK ON FARM

F16 **What is the highest level of education you and your significant other, if applicable, have completed?** (Circle number of one choice in each column.)

YOU	SIGNIFICANT OTHER	
1	1	NO FORMAL EDUCATION
2	2	COMPLETED GRADE SCHOOL
3	3	SOME HIGH SCHOOL
4	4	COMPLETED HIGH SCHOOL
5	5	SOME COLLEGE/TECHNICAL
6	6	COMPLETED 4 YEAR COLLEGE
7	7	SOME GRADUATE WORK
8	8	GRADUATE DEGREE

F17 What is the highest level of education your parents have completed?

(Circle number of one choice in each column.)

YOU	SIGNIFICANT OTHER	
1	1	NO FORMAL EDUCATION
2	2	COMPLETED GRADE SCHOOL
3	3	SOME HIGH SCHOOL
4	4	COMPLETED HIGH SCHOOL
5	5	SOME COLLEGE/TECHNICAL
6	6	COMPLETED 4 YEAR COLLEGE
7	7	SOME GRADUATE WORK
8	8	GRADUATE DEGREE

G. It would help to understand your situation by asking about important events that may have occurred in your life recently. Please indicate if any of the notable events below took place by circling the year in which that event took place.

1 Birth of a child.....	2003	2004	2005
2 Death of a family member.....	2003	2004	2005
3 Marriage for you or an immediate family member.....	2003	2004	2005
4 Divorce for you or an immediate family member.....	2003	2004	2005
5 A child left to go to college.....	2003	2004	2005
6 Adult child returned to live at home.....	2003	2004	2005
7 Major medical condition for you or an immediate family member.....	2003	2004	2005
8 You or your significant other retired from a job.....	2003	2004	2005

H. We would like to learn about the level of support provided for new businesses in your community. Please indicate the extent to which you agree or disagree with each statement by circling your answer.

Statements		(Please circle your answer.)				
1	Those with successful businesses get a lot of attention and admiration...	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
2	Young people are encouraged to start their own businesses.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
3	State and local governments provide good support for people starting new businesses.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
4	Bankers and investors go out of their way to help new businesses get started.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
5	Other community groups provide good support for people starting new businesses.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
6	The local media does a good job of covering local business news	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
7	Most of the leaders in this community are people who own their own businesses.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
8	There are many examples of well-respected people who made a success of themselves starting new businesses.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

I. Once again, imagine that you have decided to start a new business. Please indicate how accurately you think the following statements would describe each possible start-up problem your new business might face by circling your answer.

Statements	(Please circle your answer.)				
1 Being taken seriously as a business person.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
2 Receiving from family and friends.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
3 Getting suitable health insurance for myself and my family	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
4 Balancing time between business and personal or family time	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
5 Lack of mentors or a support structure who can provide advice and support.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE

J. We would like to turn our attention to the news media and learn about sources of communication in your community. Please indicate how reliable you think each source of information is by circling your answer.

Statements	(Please circle your answer.)				
1 Newspaper.....	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE
2 TV/Radio	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE
3 Internet.....	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE
4 Family member	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE
5 Friend.....	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE
6 County agent.....	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE

K. In the U.S. it is estimated that 80% of new business start-ups will fail within 5 years. Please circle the response that best represents your opinion as to how many new businesses started this year will close within five years for each type of community?

Statements	(Please circle your answer.)				
1 In rural U.S.....	MANY MORE	MORE THAN 80%	SAME 80%	FEWER THAN 80%	FAR FEWER
2 In Kentucky.....	MANY MORE	MORE THAN 80%	SAME 80%	FEWER THAN 80%	FAR FEWER
3 In rural Kentucky.....	MANY MORE	MORE THAN 80%	SAME 80%	FEWER THAN 80%	FAR FEWER
4 In my community.....	MANY MORE	MORE THAN 80%	SAME 80%	FEWER THAN 80%	FAR FEWER

L. Imagine that you have decided to start a new business. Please indicate the extent to which you agree or disagree with each statement about how certain you are that your new business will be able to accomplish each of the following by circling your answer.

Statements		(Please circle your answer.)				
1	Obtain raw materials.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
2	Attract employees.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
3	Obtain start-up capital.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
4	Obtain working capital.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
5	Deal with distributors.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
6	Attract customers.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
7	Compete with other businesses.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
8	Comply with local, state & federal regulations.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
9	Keep up with technological advances.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
10	Obtain a bank financing.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
11	Obtain venture capital financing.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN

M. Imagine that you have decided to start a new business. Please indicate the extent to which you agree or disagree with each statement by circling your answer.

Statements		(Please circle your answer.)				
1	If I work hard, I can successfully start a new business.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
2	Overall, my skills and abilities will help me start a business	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
3	My past experience will be very valuable in starting a business	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

4	I am confident I can put in the effort needed to start a business	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
5	Several new companies opened in my community in the last three years.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
6	I will have to move to another community if I want to start a new business.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

N. Listed below are some statements about business activity in your community. Please indicate the extent to which you agree or disagree with each statement by circling your answer.

Statements		(Please circle your answer.)				
1	Many new people moved into my community in the last three years.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
2	Many people in my community start new businesses.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
3	People in my community often talk about new business opportunities.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
4	Local county agents suggest new business possibilities.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
5	Several new companies opened in my community in the last three years.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
6	I will have to move to another community if I want to start a new business.....	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

O. We would like to understand characteristics about you. Please indicate how accurately the following statements would describe you by circling the answer that applies.

Statements		(Please circle your answer.)				
1	I am successful in completing new tasks.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
2	I can reach goals I set for myself.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
3	I am successful when confronting obstacles.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE

4	I can do anything I set my mind to.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
5	Owning my own business is more important than spending time with my family.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
6	I have no trouble making and keeping friends.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
7	When I make plans I am almost certain to make them work.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
8	When I get what I want, it is usually because I worked hard for it.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
9	I would be proud of my children if they started their own business.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
10	I have been very impressed with the people I know who have their own business.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
11	I would probably choose the same career path again.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
12	I usually know what is appropriate in any social situation.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
13	I consider myself a loner..	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
14	I am often concerned about what others think of me.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
15	I am a good judge of character.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE

2006 BURLEY TOBACCO PRODUCER SURVEY

As you're well aware, the tobacco production industry has changed tremendously over the last several years. And the changes have been particularly dramatic since the tobacco quota buyout. Since the buyout, a lot of the data and information about tobacco production are no longer available. Ironically, at this time of unprecedented industry adjustment and change, we have less information than ever before to help get a handle on where the industry is, where it's going, and how to ensure a successful future.

This survey is designed to collect general information about burley production, to help us identify how much is being grown, where it's being grown, how production and production practices have changed, and what the future looks like for burley production. This survey and analysis are being conducted by the University of Tennessee, with support from the Burley Stabilization Corporation.

Once the data are collected and analyzed, the summary results of this survey will be publicly available. All individual responses to this questionnaire will be kept strictly confidential!

Our testing indicates it will take you 10-15 minutes to fill out this survey. If possible, we would like for the household's primary decision maker regarding tobacco production to fill out this survey.

As research and Extension workers in tobacco, we need the type of data collected from this survey to help you and your neighbors be competitive and profitable in tobacco production. Even if you no longer produce tobacco, you can provide valuable information. Thank you for participating in this survey!

TOBACCO PRODUCTION

1. Are you producing a 2006 crop of burley tobacco?
 - ☐ yes
 - ☐ no — If no, when was the last year you produced a burley crop? _____
How much acreage did you produce that last year?
_____ acres (*skip questions that don't apply*)

2. How many acres of burley are you producing in 2006? _____
How many acres did you produce in 2005? _____
How many acres did you produce in 2004? _____

3. Do you have a contract for your 2006 burley crop?
 - ☐ yes — If yes, which company/companies do you contract with?
 - ☐ no
 - ☐ Alliance One Int'l (DIMON / Standard)
 - ☐ Hail and Cotton
 - ☐ Philip Morris
 - ☐ Reynolds American Inc (RJR / B&W)
 - ☐ Universal Leaf Tobacco
 - ☐ Other: _____

4. What yield per acre do you expect from your 2006 crop?

☐ less than 1,750	☐ 2,500 to 2,749
☐ 1,750 to 1,999	☐ 2,750 to 2,999
☐ 2,000 to 2,249	☐ 3,000 to 3,249
☐ 2,250 to 2,499	☐ more than 3,250

5. What was your yield per acre for your 2005 crop?

☐ less than 1,500	☐ 2,250 to 2,499
☐ 1,500 to 1,749	☐ 2,500 to 2,749
☐ 1,750 to 1,999	☐ 2,750 to 2,999
☐ 2,000 to 2,249	☐ 3,000 or more

6. What was your yield per acre for your 2004 crop?

☐ less than 1,500	☐ 2,250 to 2,499
☐ 1,500 to 1,749	☐ 2,500 to 2,749
☐ 1,750 to 1,999	☐ 2,750 to 2,999
☐ 2,000 to 2,249	☐ 3,000 or more

7. How did your 2005 and 2004 yield compare with your expectations?

2005 crop yield

2004 crop yield

- | | |
|--|--|
| ☐ above | ☐ above |
| ☐ below | ☐ below |
| ☐ about what I expected | ☐ about what I expected |

8. Were there unusual circumstances that caused your yield to be above or below expectation in 2004 and/or 2005?

2005 crop yield

2004 crop yield

- | | |
|---|---|
| ☐ yes (please specify below) | ☐ yes (please specify below) |
| ☐ no | ☐ no |

2005 _____

2004 _____

9. What was the average sale price you received for your 2005 crop?

- | | |
|--|--|
| ☐ less than \$1.35/lb | ☐ \$1.55 to \$1.59/lb |
| ☐ \$1.35 to \$1.39/lb | ☐ \$1.60 to \$1.64/lb |
| ☐ \$1.40 to \$1.44/lb | ☐ \$1.65 to \$1.69/lb |
| ☐ \$1.45 to \$1.49/lb | ☐ \$1.70 to \$1.74/lb |
| ☐ \$1.50 to \$1.54/lb | ☐ \$1.75/lb or more |

FUTURE PRODUCTION

10. How likely do you think you are to produce burley tobacco in 2007?

- ☐ a. definitely still producing
- ☐ b. probably still producing
- ☐ c. not sure yet
- ☐ d. probably not producing
- ☐ e. definitely not producing

11. If you answered a. or b. in question 10, how do you expect your acreage in 2007 to compare to 2006?

- | | |
|--|--|
| ☐ keep it about the same | |
| ☐ increase up to 25% | ☐ decrease up to 25% |
| ☐ increase by 25% to 50% | ☐ decrease by 25% to 50% |
| ☐ increase by more than 50% | ☐ decrease by more than 50% |

12. If you answered a. or b. in question 10 (you DO plan to produce in 2007), how would your answer change if the federal crop insurance subsidy for tobacco were not available in 2007?
- ☐ definitely still producing, even without federal insurance subsidy
 - ☐ probably still producing, even without federal insurance subsidy
 - ☐ not sure yet
 - ☐ probably not producing without federal insurance subsidy
 - ☐ definitely not producing without federal insurance subsidy
13. How likely do you think you are to produce burley tobacco in the future?
- | <u>2010</u> | <u>2015</u> | |
|--------------------------|--------------------------|----------------------------|
| ☐ | ☐ | definitely still producing |
| ☐ | ☐ | probably still producing |
| ☐ | ☐ | not sure yet |
| ☐ | ☐ | probably not producing |
| ☐ | ☐ | definitely not producing |
14. If you plan NOT to produce in 2007 or you are undecided about production in 2007 (answered c., d. or e. in question 10), which of the following factors are important in your decision? (please select no more than 3)
- ☐ age, near retirement
 - ☐ not profitable enough
 - ☐ shortage of labor
 - ☐ too risky without a price guarantee
 - ☐ contract terms too strict
 - ☐ didn't have a good contracting experience
 - ☐ poor quality of land
 - ☐ may rent out or sell my land
 - ☐ better options for making money on the farm (please specify)
-
- ☐ better options for making money off the farm (please specify)
-
- ☐ other (please specify) _____
-
15. Please indicate the degree of importance that availability of financing will have on your future production decisions.
- ☐ very important
 - ☐ fairly important
 - ☐ minor importance
 - ☐ not important at all

16. Please rank in order of importance and urgency the priority of investments in your tobacco operation that would make you a more efficient and competitive tobacco producer. (*1 is the most important, 9 is the least important*)

- _____ irrigation
 - _____ curing barns
 - _____ migrant worker housing
 - _____ field curing structures
 - _____ upgrading equipment or new equipment
 - _____ market preparation facilities
 - _____ market preparation and baling equipment
 - _____ acquiring more good land
 - _____ other investment needs not listed (please specify below)
-

17. What do you perceive to be the biggest challenges facing tobacco farmers over the next 2-5 years? (*please select no more than 3*)

- ☐ increasing costs of hiring labor
 - ☐ increasing costs of nitrogen fertilizer
 - ☐ increasing costs of *other* production inputs
 - ☐ contract prices too low
 - ☐ shortage of affordable and/or legal labor
 - ☐ availability of quality land
 - ☐ lower U.S. prices still can't compete with foreign tobacco
 - ☐ contractors may exert too much control over production
 - ☐ long travel distance to market
 - ☐ other (*please specify*) _____
-

18. What is the total acreage of your farming operation (owned plus rented land) in 2006?

- | | |
|---|--|
| ☐ less than 10 acres | ☐ 100 to 149 acres |
| ☐ 10 to 24 acres | ☐ 150 to 199 acres |
| ☐ 25 to 49 acres | ☐ 200 to 249 acres |
| ☐ 50 to 74 acres | ☐ 250 to 500 acres |
| ☐ 75 to 99 acres | ☐ more than 500 acres |

19. What other crop or livestock enterprises are part of your farm?

- | | |
|---|---|
| ☐ beef cattle | ☐ fruits or vegetables |
| ☐ dairy cattle | ☐ other types of tobacco |
| ☐ broilers/poultry | ☐ dark-fired |
| ☐ hay | ☐ dark air-cured |
| ☐ grain crops | ☐ flue-cured |
| ☐ other: _____ | |
-

20. Which category describes your gross agricultural receipts for your total farming operation for 2005?

- | | |
|---|---|
| ☐ less than \$1,000 | ☐ \$100,000 to \$199,999 |
| ☐ \$1,000 to \$4,999 | ☐ \$200,000 to \$299,999 |
| ☐ \$5,000 to \$9,999 | ☐ \$300,000 to \$399,999 |
| ☐ \$10,000 to \$24,999 | ☐ \$400,000 to \$499,999 |
| ☐ \$25,000 to \$49,999 | ☐ \$500,000 or more |
| ☐ \$50,000 to \$99,999 | |

21. What portion of your total (gross) farm receipts were from tobacco in 2005?

- | | |
|--|-------------------------------------|
| ☐ none | ☐ 50% to 74% |
| ☐ less than 10% | ☐ 75% to 99% |
| ☐ 10% to 24% | ☐ 100% |
| ☐ 25% to 49% | |

22. What portion of your net farm income do you estimate was from tobacco in 2005?

- | | |
|--|-------------------------------------|
| ☐ none | ☐ 50% to 74% |
| ☐ less than 10% | ☐ 75% to 99% |
| ☐ 10% to 24% | ☐ 100% |
| ☐ 25% to 49% | |

23. How many households shared in your 2005 tobacco receipts?

- ☐ 1
☐ 2
☐ 3 or more

24. Describe the importance of the following outlets for keeping you informed about tobacco industry developments and tobacco production research and news.

	None	Minor	Fairly	Very
the internet.....	1	2	3	4
farm magazines/newspapers.....	1	2	3	4
county extension agents.....	1	2	3	4
county/regional extension meetings, expos, field days....	1	2	3	4
neighbors/other farmers.....	1	2	3	4
contractor mailings/meetings.....	1	2	3	4
input industry/retailer contacts.....	1	2	3	4
ag retailers.....	1	2	3	4
researchers/research publications	1	2	3	4

DEMOGRAPHIC INFORMATION

25. What is the state and county of your primary farming operation?

state _____

county _____

26. Does your farming operation include other counties or states?

☐ yes

☐ no

27. What is the size of your household?

☐ 1 person

☐ 5 people

☐ 2 people

☐ 6 people

☐ 3 people

☐ 7 people

☐ 4 people

☐ 8 people or more

28. Which describes the age of the farm's primary decision maker?

☐ younger than 25

☐ 55 to 64

☐ 25 to 34

☐ 65 to 74

☐ 35 to 44

☐ 75 to 84

☐ 45 to 54

☐ 85 or older

29. Which describes your 2005 net household income?

☐ less than \$10,000

☐ \$50,000 to \$74,999

☐ \$10,000 to \$24,999

☐ \$75,000 to \$99,999

☐ \$25,000 to \$49,999

☐ \$100,000 or more

30. What percentage of your 2005 net household income was from off farm income?

☐ less than 10%

☐ 50% to 74%

☐ 10% to 24%

☐ 75% to 99%

☐ 25% to 49%

☐ 100%

31. For the farm's primary decision maker, how would you describe your primary occupation?

☐ full-time farmer

☐ employed full time off the farm

☐ employed part time off the farm

☐ retired

32. Which describes the highest level of education for the farm's primary decision maker?

☐ no formal education

☐ some college

☐ some high school

☐ completed 4-yr college degree

☐ completed high school
or equivalent

☐ completed graduate or
professional degree

THANK YOU!

Your participation in this survey is greatly appreciated. Please use the adhesive tab to seal the edge and drop the survey in the mail, no postage required. We ask that you return the survey by May 31, 2006.

Once the data are collected and analyzed, the summary results of this survey will be publicly available. All individual responses to this questionnaire will be kept strictly confidential!

If you have questions about this survey, you may contact:

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Appendix D

Summary of burley tobacco producer contract records for TTPP contracts approved in Tennessee, Virginia and North Carolina.

Address of Record	No. of Unique Observations	No. of Observations by Approving State		
		Tennessee	North Carolina	Virginia
Alaska	1		1	
Alabama	15	12	2	1
Arkansas	4	3		1
Arizona	3	1	2	
California	5	4		1
Colorado	1	1		
Delaware	1	1		
Florida	36	22	6	8
Georgia	33	19	5	9
Iowa	1	1		
Idaho	2		1	1
Illinois	5	1		4
Indiana	25	18		7
Kansas	3	3		
Kentucky	175	162		13
Maryland	8	1	1	6
Michigan	14	8	1	5
Missouri	4	3	1	
Mississippi	2	2		
North Carolina	2,713	59	2,620	34
Nebraska	1	1		
New Jersey	5	3	1	1
Nevada	1			1
Ohio	30	9	3	18
Pennsylvania	3	1		2
Rhode Island	1	1		
South Carolina	19	5	8	6
Tennessee	11,645	11,427	44	174
Texas	20	15	4	1
Virginia	3,898	71	14	3,813
Wisconsin	1	1		
West Virginia	2	1		1
TOTAL	18,677	11,856	2,714	4,107
<i>Incomplete</i>	<i>125</i>	<i>85</i>	<i>14</i>	<i>26</i>

NOTES:

1. Multiple producer contracts with identical producer names and addresses were collapsed to a single observation. The total number of burley producer TTPP contracts including duplicates to a single producer is 28,779.
2. Duplicate producer records (i.e., same producer name and same address) may still exist when the approving county or state were not identical for the contracts. That is, a name/address approved in a particular state/county was considered to be unique from the same name/address approved in a different state/county.
3. The 125 incomplete records include a contract number, approving county and state, and producer name, but do not include complete address data. Incomplete records are not included in the total.

Appendix D: Summary of Burley Tobacco Contract Records, 2006. Tiller, K

Sample Stratification

Sample	Total in Database	State % of Harvested Acreage 2002-2004 Average	State n in
Virginia	3,379	17.15%	1,029
Tennessee	10,022	68.24%	4,094
North Carolin	2,243	14.61%	877
	Avg of Contract Amount	n in State Subsample >= contract amt avg	
Virginia	\$9,651	735	
Tennessee	\$14,515	1,939	
North Carolin	\$12,258	516	

If State FIPS = 47 and SumOfAMOUNT >= 14,515 then probability of being in the sample = 1
(n=1,939)

If State FIPS = 37 and SumOfAMOUNT >= 12,258 then probability of being in the sample = 1
(n=516)

If State FIPS = 51 and SumOfAMOUNT >= 9,651 then probability of being in the sample = 1
(n=735)

If State FIPS = 47 and SumOfAMOUNT < 14,515 then probability of being in the sample = 0.2666089 (n=2,155)

If State FIPS = 37 and SumOfAMOUNT < 12,258 then probability of being in the sample = 0.209033 (n=361)

If State FIPS = 51 and SumOfAMOUNT < 9,651 then probability of being in the sample = 0.1111951 (n=294)

VITA

LaKeya Nichole Jones was born in Monroe, LA on May 10, 1982. She was raised in Winnsboro, LA and attended grade school at Winnsboro Elementary and Winnsboro Junior High, and high school at Winnsboro High School. She graduated from Winnsboro High School in 2000. She attended Louisiana State University from 2000 to 2004, and graduated with a Bachelor of Science in Agricultural Business with a minor in Business Administration in 2004. LaKeya is currently pursuing her Master of Science degree in Agricultural Economics with a minor in Statistics at the University of Tennessee.