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Post-Buyout Burley Tobacco Production and Trends in the Traditional Burley Regions of Tennessee, North Carolina and Virginia^{1,2}

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Abstract

The 2004 federal tobacco buyout ended the longstanding tobacco quota and price support programs, and also eliminated all tobacco reporting requirements. Producers are adjusting to the free market with scant information. The 2006 Burley Tobacco Survey provides an initial glimpse of post-buyout burley tobacco production, trends, challenges, and expectations.

Keywords: tobacco, quota buyout, farmer survey, tobacco production

JEL Classifications: Q12, Q18

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INTRODUCTION

The tobacco quota buyout legislation enacted in 2004 marks the most significant change in U.S. tobacco policy since the creation of the federal tobacco program in the 1930s, and one of the most dramatic and rapid policy changes experienced by any agricultural commodity in decades (Tiller, Capehart & Tegenge, 2006). Tobacco quota buyout legislation, signed into law in October 2004 and effective with the 2005 tobacco crop, abruptly eliminated the federal tobacco price support and supply control (quota) programs that had operated relatively unchanged since 1938. U.S. tobacco farmers now have two years of experience growing and marketing tobacco outside the federal tobacco program.

In the first year after the buyout (2005), tobacco acreage and prices plunged, as expected. In the first year of post-buyout transition, total U.S. tobacco acreage and production declined by 27%, and prices generally declined by 20-25% (Tiller, Brown & Snell, 2006). The number of farmers actively producing tobacco also declined dramatically in the post-buyout market characterized by reduced profitability and increased risk. Additionally, many growers appeared to have remained in production in the last years before the buyout, hoping to be eligible for buyout benefits, but ready to exit the industry after a buyout (Tiller, 2005). While it is difficult to quantify farmer exits, it appears that more than half of all tobacco farmers who were actively producing tobacco in 2004 are no longer producing tobacco, as predicted by pre-buyout simulations of the impacts of eliminating the federal tobacco program (Brown, et al., 1999).

The general objective of this paper is to explore post-buyout burley tobacco production and production decision making in traditional burley tobacco growing regions of Tennessee, North Carolina and Virginia. In the absence of rich data on tobacco production and marketing that has historically been available, this study reports the results from a mail-based survey of 6,000 burley tobacco producers. The survey is designed to provide information about how much tobacco is being produced post-buyout and where; how production patterns, attitudes, and concerns have changed following termination of the tobacco program; the factors that are influencing producers' decisions to continue producing burley tobacco or exit; post-buyout trends and challenges in tobacco production and marketing; and characteristic and demographic information about post-buyout tobacco farmers and their operations. This paper focuses on an initial exploration of factors contributing to the likelihood that a tobacco farmer will continue to produce tobacco in the future. Note that results in this paper should be considered preliminary as this is an early research step in a larger research effort.

BACKGROUND

A major change in federal tobacco policy occurred in 2004, with passage of the Fair and Equitable Tobacco Reform Act (FETRA), included as Title VII of the American Jobs Creation Act of 2004, enacted on October 22, 2004. FETRA, more commonly referred to as the tobacco buyout, marked the beginning of a period of dramatic and rapid change in the tobacco industry. While a number of factors placed a tremendous amount of strain on the traditional tobacco program over a period of several decades, the dramatic policy reversal was abrupt (Capehart, 2003). Within one year after the buyout, tobacco farmers moved from a production and marketing system tightly controlled by government limits and parameters (marketing quotas and minimum price guarantees) to an entirely free market. Under the former tobacco program,

annual tobacco production was limited to the government-set quota. Each individual producer was required to own or lease quota sufficient to cover any tobacco to be marketed.

The former federal tobacco program was very data intensive, requiring USDA's Farm Service Agency (FSA) to maintain detailed annual records of every tobacco farmer who owned or leased tobacco quota, including the exact location of the quota. The program also yielded rich market price data since tobacco was historically sold via government-sanctioned tobacco auctions. Prices were closely tied to the government-set minimum support prices guaranteed under the federal tobacco program. No tobacco could be legally sold in the U.S. without providing a significant amount of farm-level production and marketing data to the government agency administering the tobacco program.

When the tobacco program ended, the program reporting requirements also vanished. Absent government minimum price guarantees, and without the cost of the quota to factor into production, the price of tobacco in the year following the buyout fell by about 25 percent on average. Tobacco production in the year following the buyout fell by about one third, and some industry analysts suggest that two-thirds or more of all producers for some types of tobacco in some regions have exited the industry. A concern is that data do not exist that allow producers or analysts or other industry stakeholders to develop a timely and complete picture of recent changes in tobacco production, geographic movement of production, and expectations about the future of tobacco production and markets. Better industry information is needed, especially during this critical transition period.

DATA

In this study, we use data from a mail survey of burley tobacco producers to explore their intentions and attitudes regarding tobacco farmers' plans to continue growing tobacco in the post-buyout market.

The mail-based 2006 Burley Tobacco Survey was conducted in Tennessee, Virginia, and North Carolina in May 2006. A stratified sample of 6,000 burley tobacco growers was selected to receive the mail-based questionnaire. The survey sample was drawn from the FSA database of 18,677 households that received a tobacco buyout contract as an active tobacco producer (representing more than 28,000 individual contracts).¹ In order to qualify for this producer buyout contract, the individual had to actively share in the risk of producing tobacco in at least one of the years 2002, 2003 or 2004. Educated guesses place the post-buyout exit of producers at 50% or higher. Thus, a relatively large sample (6,000) was selected in order to overcome the expected low response rate for non-growers and to achieve a response level that would allow reporting geographically disaggregated data and results. The survey sample was stratified by state and TTPP contract size to try to maximize the probability of targeting active tobacco farmers representative of current production levels and locations.

¹ Under the Tobacco Transition Payment Program (TTPP, or tobacco buyout), two types of payment contracts were available. For each pound of tobacco grown and marketed in the U.S., a contract was offered to pay \$7 per pound to the individual who owned the quota, and a separate contract was offered to pay \$3 per pound to the individual(s) who actively grew the quota. When an individual owned quota and grew that quota, the individual was eligible for two separate TTPP contracts, totaling \$10 per pound (\$7 per pound as the quota owner and \$3 per pound as the active grower). In some cases, an individual owned a tobacco quota, but did not actively grow the quota, leasing the quota to another farmer for production. In this case, multiple individuals may have received a buyout contract that covered the "same" tobacco quota; one as the owner and another as the grower. This study is concerned with tobacco production, and so only uses the portion of the TTPP database listing contracts to individuals who were certified as the active grower of tobacco quota, regardless of whether they also received a contract as the owner of quota. An individual farmer may have received multiple TTPP contracts as the active grower of multiple tobacco quota lots. In drawing a survey sample from the database of database of TTPP grower contracts, every attempt was made to collapse the database to a household level, preserving total contract size for stratification.

Surveys, followed in two weeks by reminder/thank you postcards, were mailed to the sample during May and June 2006. The survey instrument 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 (e.g., Dillman, 1999). The survey instrument was pre-tested with a focus group of tobacco farmers. The booklet form questionnaire was composed of 32 questions divided into four sections: tobacco production, future production, farming operation, and demographics. The survey covers the 2006, 2005 and 2004 production years, which are crucial points in the burley industry, representing the period just before and just after the tobacco buyout.

Of the 6,000 surveys mailed, 813 completed surveys were returned representing a 13.5% response rate, considered successful given that likely half or more of the survey sample is no longer actively involved in the industry. While the design of the survey is not able to provide data to estimate the exit rate of tobacco farmers, 54% of the surveys returned indicated that they are no longer actively producing tobacco. Assuming that individuals who are still involved in tobacco farming and agriculture are probably more likely to complete and return a tobacco survey, it is reasonable to assume that significantly more than 54% of the farmers growing burley tobacco in these three states before the buyout are no longer producing tobacco. Table 1 provides a summary of the tobacco survey data, by state, showing the number and percentage of respondents actively growing tobacco in 2006, and the average tobacco acreage produced in 2006 and the two previous years. For respondents no longer actively producing tobacco, it also shown the last year in which they produced a crop of tobacco.

The responses by state are representative of each of the three states' contribution to U.S. burley tobacco production, with a much larger number of tobacco farmers and tobacco acreage in Tennessee than Virginia or North Carolina. In Tennessee, 53% of the 546 respondents are no longer producing tobacco. In Virginia, 48% of the state's 114 respondents have exited tobacco, and in North Carolina, 61% of 86 respondents have exited tobacco. Among all producers active in tobacco production in 2006, tobacco acreage averages 8.2 acres, and is considerably higher in Tennessee than in Virginia. Among producers who are no longer actively growing tobacco, the vast majority (61% in Tennessee, 63% in Virginia, and 70% in North Carolina) quit producing tobacco after the buyout legislation was passed in 2004. On average, another 22% of those no longer producing tobacco stayed in production for one year in the post-buyout free market, but exited after the 2005 crop.

METHODOLOGY

We follow the methodology of Beach et al. (2005) in developing a framework to examine tobacco farmers' intentions regarding future tobacco production. We use data from a survey of 6,000 burley tobacco farmers in Tennessee, Virginia, and North Carolina to examine the impact of farm, market, and household characteristics on the likelihood that a farmer will continue to produce burley tobacco in the post-buyout market. Similar to Beach et al. (2005), we assume that farmers seek to maximize the net present value of a stream of expected utility, subject to a time constraint, production function, and budget constraint. In examining a farmer's decision to produce a particular crop, tobacco, in a future year, we have organized the data into five primary categories that fit the expected utility model: household-specific characteristics, resource endowments, market incentives, risk and uncertainty, and biophysical factors (Beach, 2006).

For this initial investigation of the decision to produce tobacco in the future, descriptive statistics and frequency distributions for variables of interest are examined for three categories of producers. We have limited the analysis to respondents who indicated that they were still actively producing tobacco in 2006. The first group (referred to as Producing) includes those current producers who indicated that they are likely to produce burley tobacco in 2007 (agreed with the statements that they intend to *definitely* or *probably* still produce in 2007). The second group (referred to as Undecided) includes those current producers who indicated that they are not sure yet how likely they are to produce burley tobacco in 2007. The third group (referred to as Exiting) includes those current producers who indicated that they are likely not to produce burley tobacco in 2007 (agreed with the statements that they intend to *probably not* or *definitely not* produce in 2007).

Similar to the statistical exploration of cattle management production practices in Vestal, et al. (2006) Statistical tests were performed to determine whether the distribution of producers among the three categories—Producing, Undecided, and Exiting—was 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. Among current producers, 60% indicated they are definitely or probably likely to continue producing tobacco in 2007 (Producing); 35% are in the category Undecided; and 5% indicated they are probably or definitely exiting tobacco production in 2007 (Exiting).

Based upon the type of response data for variables of interest, initially, t-tests of mean responses and chi-square tests of frequency distributions, by category, comprise the statistical analysis. Some of the variables of interest were continuous, some had yes/no responses, some were Likert scale responses, some were ordinally ranked. Some of the questions allowed

multiple responses and in some cases, for this statistical analysis, some of the responses were grouped into dummy variable responses for like categories of responses.

RESULTS

In examining a farmer's decision to produce a particular crop, tobacco, in a future year, we have organized the data into five primary categories that fit the expected utility model: household-specific characteristics, resource endowments, market incentives, risk and uncertainty, and biophysical factors. Variables of interest are grouped into these five categories in examining the results of the exploratory statistical evaluation. Table 2 presents the means of variables for which mean calculation is appropriate. In cases where categorical responses were reported for variables and means could be calculated, the distributions of categorical responses for education and age were weighted by midpoints to estimate a mean and t-statistic (LaMotte and Blair). Table 3 presents frequency tables for categorical variables of interest.

Household-Specific Characteristics

Three measures of household-specific characteristics are included for the household's primary decision maker: the highest level of education achieved, age, and the primary occupation. The distributions of categorical responses for education and age were weighted by midpoints to estimate a mean and t-statistic (LaMotte and Blair); distribution of the means for both were found to be statistically significant across categories for the likelihood of continuing in tobacco production. Farmers with higher levels of education are more likely to indicate an intention to continue producing tobacco. Age is also a factor in the production decision, where younger farmers were more likely to continue to grow tobacco than older farmers. The average age of farmers indicating an intention to produce tobacco in 2007 was 54, while the average age

for those indicating an intention not to grow tobacco in 2007 was 60. As seen in Table 3, respondents categorized their primary occupation as a full-time farmer, a farmer working part-time off the farm, a farmer working full-time off the farm, or retired. Among respondents who are retired, a higher percentage are likely to exit tobacco production (8%) than for other occupation categories. More than half (52%) of all respondents in the Producing category are full-time farmers while only 40% of Exiting farmers are full-time farmers.

Market Incentives

Four measures of market incentives are included in the analysis indicating exogenous market factors that influence production decisions, presented in Table 3 and Table 4. The first measure is the dummy variable Contract, which indicates whether or not the respondent had a marketing contract for his tobacco production in 2006. This variable provides a measure of market access, where having a marketing contract indicates the availability of marketing opportunities. Among producers who had contracts, 61% intend to remaining in production, compared to 53% for farmers without contracts. The variable indicating whether or not the farmer grows other types of tobacco on his farm is another market incentive variable indicating the infrastructure in place for burley tobacco production. 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 tobacco. While a relatively low percentage of respondents reported growing additional types of tobacco, those who do were much more likely to be in the Producing category (73%). The third variable considered is an indicator of the importance of the availability of financing. This is an indicator of the economic

environment in which the producer expects to operate. The importance of the availability of financing appears to be highest among those in the Producing category, and lowest among those in the Exiting category. Finally, price expectation is a market factor hypothesized to influence a producer's decision. Given two years of post-buyout market price information, variation in 2005 prices is assumed to proxy for variation in price expectations among groups. Table 2 shows the estimated average price reported, where price is relatively constant among the three categories, with farmers in the Producing category reporting a slightly higher average price (\$1.56 per pound) compared to farmers who are Undecided or Exiting (\$1.55). While average prices are similar, the distributions are skewed toward higher prices for those indicating intent to continue producing tobacco.

Resource Endowment

Four measures of the household's resource endowment are included in the analysis. Total farm acreage is a measure of land capacity. Across categories, the average farm size for producer planning to continue to produce tobacco is 110 acres, while it is 118 acres for farmers in the Exiting category, and 94 acres for farmers who are Undecided. Among producers in the Producing category, average tobacco acreage is considerably higher, at 9.6 acres, compared to an average tobacco acreage of 6.5 acres among Undecided farmers, and 4.8 among Exiting farmers. This may indicate the degree of tobacco-specific investments in equipment, barn, and other capital. The percentage of total gross farm receipts contributed by tobacco also indicates household resources invested in and related to tobacco production. Among all tobacco farmers, the tobacco enterprise represents a sizable share of total farm receipts. Among tobacco farmers planning to continue to produce tobacco, it comprises 47% of all farm receipts, while it comprises 46% of all farm receipts for Exiting tobacco farmers. The size of the household is an

indicator of the endowment of time for the household in the utility model. Farmers in the Producing category have larger households (averaging 2.6 persons) compared to Exiting farmers (averaging 2.3 persons).

Risk and Uncertainty

The tobacco industry is still adjusting to the dramatic changes brought about by the tobacco buyout (Tiller, Brown and Snell, 2007). Several variables are included to indicate the influence of various sources of market, price, production, and institutional uncertainty, presented in Table 3. In the survey, respondents were asked to select from a list up to three factors they perceive to be the biggest challenges facing tobacco farmers over the next 2-5 years. Several of these factors are measures of the degree of risk and uncertainty perceived by the farmer. Burley tobacco production is extremely labor intensive, with few mechanization alternatives (Denton, et. al., 2002). The first factor considered is labor, including both the increasing cost of hiring labor, as well as the shortage of affordable and/or legal labor. Among those who indicated that labor is a significant challenge, more than one-third are Undecided about future production, similar among those who did not indicate that labor was a significant challenge. Another risk factor considered is increasing costs of production, including nitrogen fertilizer and also other production inputs (except hired labor). Among those who indicated that rising production costs are a significant challenge, only 59% intend to continue to produce, with more than one third Undecided. More than two thirds of all respondents indicated that a significant challenge to tobacco farmers in the future is that contract prices are too low. Among those, 41% are Undecided about future production. A measure contract risk is agreement with the statement that one of the biggest challenges facing tobacco growers in the future is that contractors may exert

too much control over production. Among those respondents indicating this was one of their top three concerns, 34% are Undecided about producing tobacco in 2007.

Biophysical Factors

Farming is dependent on biological and biophysical influences beyond an individual farmer's control. At the time of the survey, the 2006 crop had been planted, but it was much too early in the growing season to determine the extent to which exogenous forces may influence crop yields. Thus, respondents were asked about their expected yield, indicating a measure that can proxy for farm specific biophysical factors that influence productivity. While the average burley yields for farmers indicating they are in the Producing or Undecided category are close (2,291 and 2,303 pounds per acre, respectively), they are nearly 100 pounds higher than the average yield expected for producers in the Exiting category, indicating that they may be on more marginally productive land or be in areas prone to production limiting influences. Another measure to consider is the extent to which a farmer thought that a major challenge to tobacco farmers in the future is the availability of quality land. Among respondents indicating this is a significant challenge, 78% plan to continue to produce tobacco, while 6% plan to exit.

DISCUSSION

Though this one study does not address the long-term information void for the new free market tobacco production industry, it does provide a first glimpse of detailed post-buyout production, trends, challenges, and decision factors. The study provides specific and measurable details about the current burley industry, information that has been unavailable since the program ended with the 2004 crop.

Using the information developed in this exploration of the survey data, it is instructive to begin to develop hypotheses about the profile of a future tobacco farmer, especially compared to those tobacco farmers who are not fully committed to continuing to produce tobacco or who intend to exit the industry. Among farmers who intend to remain in the industry, it appears that they are more likely to be younger, more highly educated, have a larger household, and to consider themselves a full-time farmer without off-farm employment. Not surprisingly, those tobacco farmers with larger tobacco acreage and with a higher percentage of their total farm income coming from the tobacco enterprise are more likely to continue growing tobacco, although the influence of the total farm size on the decision to remain in tobacco production is less clear. Also not surprisingly, farmers with marketing contracts and higher average yields are also more likely to remain in tobacco production. Some of the most pressing challenges for the future of tobacco production are perceived to be the availability and affordability of hired labor, increasing costs of production, and contract prices that are too low to make tobacco a profitable alternative.

The variables identified and described in this effort can be used in further analysis modeling the specific influence of the variables on the decision to continue to produce tobacco, and also the intent to expand tobacco acreage, among those indicating a strong desire to continue to produce tobacco. Of further interest is the difference in these factors on the short-term decision to remain in tobacco production versus the longer-term (5-10 year) commitment to remaining in the tobacco production industry.

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Table 1. Number of survey respondents, by state, actively producing tobacco and average acreage produced, or last year actively producing tobacco.

Growing Tobacco in 2006			Not Growing Tobacco in 2006		
Tennessee					
Status	<i>n</i>	%	Status	<i>n</i>	%
	256	46.9%		290	53.1%
Avg Acreage	<i>acres</i>	<i>n</i>	Year Exited	<i>n</i>	%
2006	9.11	257	2005	57	21.9%
2005	8.77	289	2004	159	61.2%
2004	7.79	437	2003	30	11.5%
Virginia					
Status	<i>n</i>	%	Status	<i>n</i>	%
	59	51.8%		55	48.3%
Avg Acreage	<i>acres</i>	<i>n</i>	Year Exited	<i>n</i>	%
2006	4.83	58	2005	13	25.5%
2005	4.83	65	2004	32	62.7%
2004	4.58	92	2003	5	9.8%
North Carolina					
Status	<i>n</i>	%	Status	<i>n</i>	%
	34	39.5%		52	60.5%
Avg Acreage	<i>acres</i>	<i>n</i>	Year Exited	<i>n</i>	%
2006	7.32	35	2005	10	21.7%
2005	7.06	40	2004	32	69.6%
2004	7.95	70	2003	2	4.4%
Survey TOTAL					
Status	<i>n</i>	%	Status	<i>n</i>	%
	374	46.3%		433	53.7%
Avg Acreage	<i>acres</i>	<i>n</i>	Year Exited	<i>n</i>	%
2006	8.20	375	2005	80	22.3%
2005	7.95	424	2004	225	62.7%
2004	7.28	648	2003	37	10.3%

Table 2. Mean number of survey respondents, by state, actively producing tobacco and average acreage produced, or last year actively producing tobacco.

		Producing	Undecided	Exiting
Household-Specific Characteristics				
Education*	<i>years</i>	12.7	12.2	11.4
Age**	<i>years</i>	54.3	56.3	60.2
Resource Endowment				
Total Farm Acreage*	<i>acres</i>	110.4	93.9	117.5
Tobacco Acreage**	<i>acres</i>	9.6	6.5	4.8
Household Size**	<i># people</i>	2.6	2.5	2.3
Tobacco % Farm Receipts	<i>%</i>	46.9	46.9	46.2
Market Incentives				
Price	<i>\$/lb</i>	\$1.56	\$1.55	\$1.55
Biophysical Factors				
Tobacco Yield*	<i>lbs/acre</i>	2,291	2,303	2,208

* indicates that the distribution of the means across categories are statistically different at the 10% significance level.

** indicates that the distribution of the means across categories are statistically different at the 5% significance level.

Table 3. Frequencies of variables, by farmer likelihood of producing in 2007.

Household-Specific Characteristics				
Primary Occupation				
	Full-Time	Work Part- Time Off	Work Full- Time Off	
(n=347)	Farmer	Farm	Farm	Retired
Producing	107	27	45	28
	62%	63%	54%	58%
Undecided	60	14	35	16
	35%	33%	42%	33%
Exiting	6	2	3	4
	3%	5%	4%	8%
Market Incentives				
Contract				
(n=374)	Yes	No		
Producing	205	20		
	61%	53%		
Undecided	116	16		
	35%	42%		
Exiting	15	2		
	4%	5%		
Grow Other Tobacco Type(s)				
(n=357)	Yes	No		
Producing	29	187		
	73%	59%		
Undecided	10	116		
	25%	37%		
Exiting	1	14		
	3%	4%		
Importance of Financing Availability*				
(n=360)	Major	Minor	Somewhat	None
Producing	64	43	54	60
	67%	61%	69%	52%
Undecided	29	26	23	45
	30%	37%	29%	39%
Exiting	3	2	1	10
	3%	3%	1%	9%

Table 3, continued.

Table 3., continued.

Risk & Uncertainty		
Biggest Challenge is Labor		
<i>(n=369)</i>	Yes	No
Producing	164 61%	60 61%
Undecided	97 36%	34 35%
Exiting	10 4%	4 4%
Increasing Costs of Production		
<i>(n=369)</i>	Yes	No
Producing	141 59%	83 64%
Undecided	87 36%	44 34%
Exiting	11 5%	3 2%
Contract Price Too Low**		
<i>(n=369)</i>	Yes	No
Producing	139 57%	85 68%
Undecided	99 41%	32 26%
Exiting	6 2%	8 6%
Contract Risk		
	Yes	No
Producing	31 66%	193 60%
Undecided	16 34%	115 36%
Exiting	0 0%	14 4%
Biophysical Factors		
Concerned About Availability of Quality Land**		
	Yes	No
Producing	25 78%	199 59%
Undecided	5 16%	126 37%
Exiting	2 6%	12 4%

Top number is frequency, bottom number is percent of total for the response.

* indicates a significant difference in chi-square at the 10% significance level.

** indicates a significant difference in chi-square at the 5% significance level.