The mission of the Center for Tobacco Grower Research is to conduct timely research in the areas of tobacco production, economics, and markets that will provide information that will support the sustainability of U.S. production of burley, flue-cured, dark and other types of tobacco.

Objective

In comparison to previous years, labor availability was not as big of an issue to tobacco grower participants in CTGR's Current and Former Growers survey in 2009. Whereas 60.4 percent of burley producers, responding to the 2008 CTGR Current and Former Growers survey, indicated they had trouble finding enough labor for their farming operation, only 44.3 percent indicated they had trouble in 2009.

However, the cost and availability of labor was still named as an important factor in producers' decisions of whether or not to produce and how much tobacco to produce. Sixty-five percent of burley respondents indicated that availability of labor was a very important factor to their production decision, while 68 percent indicated the cost of labor was a very important factor. So even if labor was not such a limiting factor in 2009 as in previous years, it still was a very important factor in growers' decisions whether or not to produce and how much tobacco to produce.

While the adoption of mechanical harvesters among flue-cured producers has been quite successful, very few acres of burley tobacco are harvested using mechanical harvesters. Several different systems have been developed to mechanically harvest and strip burley tobacco, but no system has received widespread acceptance by producers.

The objective of these focus groups was to explore the producers' thoughts and attitudes toward the mechanization of stripping and grading burley tobacco. The first portion of the focus group covered general questions about various types of mechanization in the burley tobacco production process and if growers were interested in mechanization as a potential source of labor savings. As an introduction to the potential of mechanized stripping/grading, a short video was shown to demonstrate one specific mechanical stripper/grader. After viewing the video, a discussion with participants was directed more specifically toward the mechanization of stripping/grading. The discussion was allowed to flow freely, guided by a list of questions from the group facilitator.

Methods

The 2009 production mechanization focus groups were conducted with burley tobacco growers in two Tennessee locations and one Kentucky location. The initial focus group was held on December 10 in Lafayette, Tennessee and represented Macon County growers. On December 16, a second focus group was held in Greeneville, Tennessee and included growers from Greene, Hamblen, Hawkins, and Washington counties. Producers from Clark, Fayette, and Woodford counties in Kentucky attended the third focus group in Lexington, Kentucky on December 17.

Local County Extension Agents in East and Middle Tennessee, and a local Extension Agent and Extension Associate in Central Kentucky recruited participants for each of the focus groups. For each group, tobacco producers were invited from multiple counties in the region representing farms with various crop mixes and levels of burley tobacco production.

A copy of the questionnaire filled out by each participant and the outline of questions used by the facilitator are presented in the Appendix. A summary of the participants' demographics is presented in the following table.

Summary of Participant Demographic Data from Burley Tobacco Focus Groups 2009: Macon and Greene Counties in Tennessee, and Fayette County, Kentucky*

	Macon County, Tennessee			Greene County, Tennessee			Fayette County, Kentucky			All Locations		
	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median
Grower Age (yrs)	9	48	47	12	43	40	8	54	52	29	48	48
Acres Grown	9	169	65	12	59	16	8	37	37	29	87	40
Cost per Acre ($)	9	2160	1800	10	2285	2450	6	2800	3004	25	2344	2400
Yield per Acre (lbs)	9	1678	1500	11	2405	2300	8	2670	2550	28	2247	2200
Years of Production Experience	9	34	32	12	24	23	8	35	35	29	30	30

* 86% of the participants classified themselves as full-time farmers. Only 4 growers were part time.
* Only one farmer indicated growing tobacco other than burley. This grower had a quarter-acre of dark air-cured tobacco.
* The participants listed a variety of farm enterprises in addition to burley tobacco production in which they were involved with producing. Additional farm enterprises include: cattle, corn, hay, straw, soybean, greenhouse tobacco transplants, hogs and strawberries.

Summary of findings in Macon County

Even though Macon County is the largest burley producing county in the United States, none of the nine focus group participants at this location indicated that they have moved toward mechanization of any portion of their burley production. When asked why they have not adopted mechanization, the initial response from several growers was "we're old school." Upon further discussion, growers said their lack of mechanization was not because they are opposed to it, but because they have not found it practical for their operations. In describing practical, they specifically mentioned that affordable mechanized cutting systems were not quick enough for large-scale production. Several growers also stated that if they did not have access to migrant labor, they would employ mechanized systems that make the jobs physically easier for them. With the availability of migrant labor, however, they do not see mechanization as economically advantageous for their operations.

When asked what type of mechanization they would be most interested in, the majority of growers mentioned machinery for the cutting and the stripping/grading phases. Specifically, several participants expressed high interest in a mechanized process for stalk removal from the sticks during the pre-stripping phase. Many of the growers stated that they currently use "big balers" for market preparation and do consider this to be a form of, or a step toward, mechanization. Properly casing stripped loose leaf was also a topic of great interest among the participants. However, the use of a casing room to bring tobacco into proper order/case before stripping/grading was quickly dismissed by most of the participants. They indicated that a casing room was not a practical consideration for their operations. Conversely, the idea of having on-farm conditioning equipment was quickly supported as a more practical way of influencing case. Although not readily available at this time, growers are hopeful this type of equipment will be available to them in the future.

After watching the video on how a mechanical grader operates, many participants said they had seen the machine before but had not seen it in operation. Participants expressed strong interest in the machine and how it works. Participants asked several questions and raised several concerns about the machine. Some of the topics of interest expressed by participants included: the cost and size of the mechanical grader, the percent moisture level for most effective leaf removal, the machine settings for proper division of grades, and the system for catching the graded leaves. One participant asked if a machine might be available for a trial run this winter.

Participants were asked to share their overall impression of the mechanized grader based on viewing the video. One grower suggested taking the arrangement a step further and adding a perpendicular conveyor under each grade for the purpose of removing non-tobacco related materials (NTRM), and then moving the leaves along to a "conditioner" and then to a big baler. "Then, I think you'll have some promise," he said. Other participants also voiced concern over

NTRM and wondered if "picking" (the NTRM from the graded leaves) would cancel out any labor saved by using the mechanized stripper/grader. Several growers were interested in the addition of a conveyor at the far end of the machine to catch bare stalks that would carry them to a chopper to ease the problem of stalk disposal. One participant even stated that an improvement with stalk disposal alone might make the system worthwhile to him.

The potential for elimination of migrant labor positions due to the possible increased stripping efficiency was a common concern of many of the participants. Burley tobacco producers commonly employ the same migrant crew that cuts and houses their tobacco to also strip and grade. Therefore, if the number of workers in a crew decreased due to the use of a mechanical grader, many of the participants expressed concern over losing the entire crew.

When participants were asked if they thought the potential labor savings from the mechanized grading machine could offset potential declines in bale quality, one grower said he could not justify using such a machine in his situation, not for financial reasons but for the loss in quality and speed of stripping. Even if the cost of the machine were zero, based on what was seen in the video, participants said too many people still had to be employed for the slowness of grading. Once again, the idea of adding a stalk conveyor and chopper system to the machine was praised for lowering labor needs.

Participants expressed several concerns about the machine being able to prepare the highest quality bales. In general, concern was voiced about the increased demand for quality from tobacco buying companies while considering a type of mechanization that lowers the integrity of the leaf and lessens the quality of the bale grades.

None of the growers felt the machine would be too complicated for them or their crews to maintain and repair as necessary. They stated that finding any special parts for the machine would be difficult, but bearings and chains would be easy. When the participants were told that the rotating beaters that remove the leaf from the stalk cost $2000 per set and only last for approximately 40 acres, the participants were taken aback. The high cost of the beaters combined with the $32,000 cost of the machine, greatly lessened the appeal of the machine to the participants. One participant stated the cost of the beaters alone would make it price prohibitive for his operation.

In general, participants indicated that they would desire for the mechanical grader to pay for itself in one year if they were to make the investment. One participant responded that if the machine lasted 20 years he would be glad to pay it off in 10, but the life and cost of the beaters make it price prohibitive.

When participants were asked in which part of the production process they encounter the most trouble, the consensus was in cutting/harvesting. The growers, however, generally saw less potential for the mechanization of cutting/harvesting than for stripping/grading. One participant suggested there was no way to solve the cutting problem. Participants indicated that of the mechanized cutters that are currently available on the market, none work well enough, nor are they priced low enough to reduce labor costs during this phase of production.

When participants were asked about their likelihood of purchasing a mechanized grader in the future, most agreed that if the mechanical grader was improved by adding conveyors for each tobacco grade and one for stalk removal, then they would be more interested in purchasing a mechanical stripper/grader. Improved leaf integrity and increased definition in grade separation were also noted as necessary improvements that need to be made in the mechanized machine in order to increase grower interest in adopting the technology.

None of the growers expressed an interest in cooperative ownership of a mechanical stripper/grader. In general, the participants felt that cooperative ownership would not work well because, among other things, scheduling the use of the machine by more than one grower would be a problem. The participants described that, inevitably, when one grower would need the machine, others would also need it which would make cooperative ownership nearly impossible.

Summary of findings in Greene and Surrounding Counties

Before the tobacco buyout in 2004, Greene and the surrounding Tennessee counties of Hamblen, Hawkins and Washington were the center of burley tobacco production in upper East Tennessee. Over the past several years, the number of growers in those counties has decreased and left fewer but larger tobacco producing operations.

At the beginning of the focus group session in Greeneville, most participants initially responded negatively to the idea of mechanizing any portion of their burley tobacco production process. One participant made the comment, however, that the invention of the tobacco setter was a very important and positive step in mechanization that saved many hours of back-breaking work. Several other participants agreed. When the concept of mechanized cutting surfaced during the session, one participant said, “Ah, just borrow the money and put them [migrant laborers] to work.” Another stated that mechanized cutting is now “better than it was 15 years ago – every one I ever saw work was a catastrophe!” The concept of mechanized stripping/grading was not well received either, due to more stringent grading and moisture testing by contractors this year (2009).

When participants were asked why their production systems were not mechanized or moving toward mechanization, one grower stated that hand cutting/harvesting tobacco was cheap for him, but the stripping/grading process was a problem. Another grower said that if he or other growers purchased a stripping machine and it interfered with a portion of their migrant cutting crew's employment, none of the crew would use the machine because they would want all their co-workers to have work. Others agreed that if one migrant worker became angry about a working condition, the entire crew normally became angry too. They emphasized that when this type of problem arises, they may very well end up with no one to work. Furthermore, if someone outside a "normal crew" is hired, the usual crew may not show up to work at all.

In general, participants did not seem to favor contracting companies' support of research on mechanization for burley tobacco production. One grower stated he would rather the incentives from the companies, such as those given for meeting crop throw and poundage, and delivering in big bales, be done away with and distributed evenly to all growers. They described that since producers cannot predict the growing and curing conditions from one production year to the next, they cannot predict if their crop will be sufficient to receive incentive payments. The participants emphasized that this uncertainty can and does limit producer investment in mechanization as well as investments in other infrastructure. Most all the participants supported the idea of allowing the farmers to figure out the best way to produce their crop, whether with mechanized equipment or not.

Most growers responded, "No." when asked if they were holding off on mechanizing tobacco production just because of the expense involved. They seemed to lack interest in mechanization mostly because of it interfering with their overall labor needs and because of the tremendous uncertainty in the tobacco industry as a whole. One grower again noted the problems associated with migrant labor crews if jobs were lost due to mechanization. Another grower said, "I think the problem is uncertainty. Why invest in expensive equipment when the future of the tobacco industry is so uncertain?" Several participants expressed concern over the seemingly uncertain future of the contracting companies based on the offering of very few grower contracts for more than one year and the recent closing of regional receiving stations. When discussing these hindrances, the issue of increased transportation costs also surfaced. In general, participants agreed that having to drive long distances to receiving stations would put an added financial burden on an already shaky net return.

When asked what type of mechanization they would be most interested in, the majority of growers agreed that some type of stripping/grading machine would be most beneficial to their operations. Participants described an ideal stripping/grading machine as an efficient unit cheap enough for a 10 acre grower to afford and for larger growers to purchase two or three. One participant said he would be interested in using one himself if he was not able to hire help. Interest in eliminating stalk handling after stripping/grading was high. Several of the growers

really emphasized the benefit of using a conveyor belt system to move the stalks to a chopper where the material could then be easily spread by manure spreaders or silage wagons.

After watching the mechanical grader video, many participants said they had seen the machine at the University of Tennessee Research and Education Center in Greeneville, Tennessee, but they had not seen it in operation. One grower asked the price of the machine, and when it was quoted as $32,000, he immediately said, "Don't put me down for one!" Another grower stated that for the price tag, the machine should be able to very efficiently and accurately grade the tobacco. Concern was also voiced over the size of the machine and the need for a "warehouse" size facility in which to adequately setup the machine and other equipment necessary to make the system as efficient as possible. Based on the observations and information mentioned above, more detailed discussions ensued over the particular workings of the machine such as the appropriate moisture content of the tobacco for effective leaf removal, adjustments for stalk length variability, and the ability to adequately separate grades. Concerns about the mixing of grades and the potential for a high amount of non-tobacco related materials (NTRM), particularly suckers, in the baled leaf were discussed. The majority of participants expressed their greatest concern over the need to hand-pull the tip leaves before feeding each stalk into the gripper chain of the stripping/grading machine, noting that this alone could negate the potential of any labor savings. The participants recognized that removing the tips is necessary because not pulling them could result in 200 plus pounds of tip grade being lost per acre. The growers simply felt that such an expensive mechanized stripping/grading machine should also be able to eliminate hand-pulling of the tip leaves.

Most participants replied negatively when asked how they thought the leaf quality and bale grades given by the buyers would be affected by mechanical stripping/grading. One grower stated that even if the machine worked as it should, the bales would probably not be acceptable based on the strictness of the buyers grading scale for the 2009 crop.

When asked if they thought the labor savings from the mechanized stripper/grader could offset the loss in quality, the general consensus among participants was, "No." One participant felt that it would be critical to any operation to continue to employ the same migrant crew on a yearly basis after they initially learned how to operate the machine efficiently. Some participants admitted that mechanized stripping/grading would enhance the potential of increased labor savings.

None of the growers felt the machine would be too complicated for them or their crews to maintain and repair. Several even agreed that they could probably improve upon the mechanical stripper/grader concept shown in the video, stating that "farmers are usually the best innovators." When the participants were told that the rotating beaters that remove the leaf from the stalk cost $2000 per set and only last for approximately 40 acres, one participant commented,

"Okay, we're done. You had me interested there for a minute!" The short lifespan of the rotating beaters coupled with their replacement cost was a major concern for most of the participants.

When asked how many crop years growers would be willing to wait for complete payback on an investment in a mechanical stripper/grader, there were no direct responses. The statement was made, however, that the machine was definitely not for small growers, and even for big growers, it would not be economically feasible or efficient because the system does not include sorting or baling. One grower stated that if the machine made the bales, he thought it might be an okay investment. Another stated that, "anything that pays for itself in 5 years and works is probably worth its money if it will do what it's supposed to do." On the other hand, some producers expressed concern over investment in a mechanized production system while the possibility of reduced demand, contract losses and the potential for production to move overseas loomed in the future.

Even though the majority of the participants agreed that some type of a mechanized stripper/grader would be most beneficial to their individual operations, they stated the likelihood of them adopting mechanization in their production systems in the next five years was, "Slim to none." One participant did admit that he could see it (mechanical stripper/grader) as a possibility if the price was reasonable and the machine was tweaked to where the beaters and overall machine would last.

Summary of findings in Fayette and Surrounding Kentucky Counties

Lexington, located in Central Kentucky's Fayette County, is the world's largest burley tobacco market. Located on either side of Fayette County are Clark and Woodford Counties, all of which are major burley producing areas in Central Kentucky. Growers from each of these counties attended the mechanical grader focus group session in Lexington. When asked if anyone had mechanized a portion of their burley production, several participants mentioned the mechanical tobacco setter and the greenhouse float bed system of transplant production. One grower said he used a cable-hoist housing system in his burley curing barn and that even though the tobacco housed there had a better cure, the system required "a lot of work and only provided a costs savings if [he was not] in a hurry." Several participants owned big balers but said they did not like to use them but were afraid to sell them because rumor has it that one day growers will be required to bring their crop to market in big bales. When participants were asked why their systems were not more mechanized and what kept them from adopting more mechanized activities, the general consensus was the high investment cost and the uncertain future of tobacco contracts and companies. Furthermore, with labor being readily available in this time of economic depression, growers stated they were able to get the tobacco cut and ready for market without making any investments in mechanical aids.

When asked what type(s) of mechanization the group would be most interested in, one grower stated harvesting while another stated stripping/grading. Overall, participants agreed that the harvest period presented more of a crunch time than stripping/grading due to the recommended interval between topping and cutting, and the ever changing weather conditions. They also stated that when tobacco was cured and ready to strip/grade, timing was somewhat less critical and the time frame longer. The mechanical topper was given as the form of mechanization of least interest to the group.

One grower said he had participated in a mechanical stripper/grader pilot project in Frankfort, Kentucky this year (2009) and shared his experience with the group. In the pilot project, after the tobacco cured, the grower took his tobacco down from the barn, removed the stalks from the sticks and hauled it to a receiving station for mechanical grading/stripping. He stated that the machine still had a lot of room for improvement. He added that the stripping/grading machine used in the pilot did do a better job with some of the crops in the pilot than his. When asked why, he said his tobacco appeared to be dryer than others which seemed to cause more mixing of the grades as the tobacco moved along the stripping chain. That is, his tobacco crop was lower in case/order than other people's such that as the beaters turned to remove his upper level leaves, the lower leaves shook loose causing them to fall into the upper grade leaf boxes. The grower said he was certain he and his crew could have done a much better job hand stripping and grading than the mechanical machine, given the condition of his crop.

Once the participants viewed the mechanical stripper/grader video, they were asked to share their impression of the machine. One participant noted, in particular, that manually removing the tip grade from the stalk and then feeding the stalk into the grader defeated the purpose of mechanizing the process. He stated that if a person is already holding the stalk to remove the tip leaves, "why not go ahead and strip the rest of it off?" Based on his observation, participants really questioned and were pessimistic about the potential of the machine to lower labor costs.

However, the grower who participated in the pilot program said in his experience, the setup included a conveyor for each grade so that when the leaves were mechanically removed they fell onto a conveyor and were moved along to a big baler, eliminating the labor of moving and storing boxes and baling later.

When participants were asked their opinion of leaf and bale quality using the mechanized stripper/grader, the group was divided. Some said the machine graded bales looked more uniform and of better quality, while other said just the opposite. The grower involved in the pilot program said he personally saw hand graded bales that looked worse than some mechanically stripped bales and just the opposite, too, when he was at the receiving station where the pilot program was being ran.

In general, participants agreed that overall, big bales brought higher prices than did the traditional 90 pound bales. Some questioned if this was a subliminal message to growers to encourage them to market their tobacco in big bales, or just a forecast of what was to come.

When asked if the participants thought that labor savings with the mechanical stripper/grader could offset the loss in quality, the issue of manually pulling tips resurfaced. The growers were not able to give a definite answer to this question because they were very caught up in the tip leaf definition, grading and pricing by the contractors/buyers. Another grower mentioned that if he had to take all of his tobacco to a central location (where the mechanical stripper/grader was set up) to strip it, he would have to handle his tobacco more times and his transportation/fuel costs would increase. All growers agreed that stripping and baling non-oriented leaf was a huge labor savings.

None of the growers thought the machine would be too complicated for them or their crews to maintain or repair. Several growers, however, stated that growers with larger acreages of tobacco might have better access to, or availability of experienced mechanics.

In general, participants said if they invested in a mechanical stripper/grader, they would require at most a three year pay period, and more likely, a two year period. They cited the uncertainty of the market as the major obstacle in making investments. One participant said he would love to have a mechanical grader and made the point that going with new technology is not always cheaper, but if it works well and offers multiple advantages it may be to a grower's advantage to go with it. He used the greenhouse float system as an example. The price of the system started out high, but as the idea was accepted and used, the cost of producing the plants came down and worked to most producers' advantage. The participants also described other advantages of the float system for transplants such as convenience, direct seeding, plant quality, and survivability as an analogy for additional advantages of other mechanized activities such as stripping/grading.

Most participants agreed that the production steps in which they encounter the most problems were in harvesting, housing, and stripping. They noted that labor is currently abundant in their counties, but if it became scarce, they would have a very difficult time with these tasks and would be very interested in the mechanized cutter and stripper/grader.

Participants were generally not interested in owning a mechanical grader cooperatively. "Not happening" was heard more than once when this question was asked. The logistics of transporting tobacco to a cooperatively decided home base for the machine and arranging the timing of use among several producers were cited as the two greatest drawbacks. However, when the idea of a custom mechanical stripping/grading option was suggested by a fellow

participant, other participants became interested and more accepting. The idea of mechanical stripping/grading being offered as a custom service received a great deal of positive discussion. Participants began to estimate what such a custom service would cost and what it would be worth. Participants seemed to have an underlying assumption that a custom service would have a more reliable scheduling system and would be better and more efficiently operated than a cooperatively owned machine.

In general, participants did not indicate that their operations were very mechanized at this time. When asked about the likelihood of moving toward mechanization within the next five years, most participants agreed that if they could make an investment that would pay off in two years, they would likely adopt it.

Appendix

Mechanization Survey
County, State
Month Day, 2009

DEMOGRAPHICS

Name: _____

Age:_____

County in which your farm is located: _____

1) For your 2008 crop, what is your best estimate of your total cost per acre of burley tobacco?

$_____ per acre

2) For your 2008 crop, what was your yield in pounds per acre?

_____ pounds per acre

3) How many acres of burley tobacco did you in plant in 2009?

_____ acres

4) What portion of your total farm cash receipts was from tobacco in 2008? (Circle one)

a. 0% - 25% b. 26% - 50% c. 51% - 75% d. 76% - 99% e. 100%

5) Are you a full time or part time farmer? (Circle one)

a. full-time b. part-time

6) How many years have you grown burley tobacco?

_____ yrs

7) a) In 2008, did you grow any other types of tobacco?

_____ YES _____ NO

b) If yes, list type and acres of each.

Type_____ # of Acres_____

Type_____ # of Acres_____

8) What other farm enterprises do you have?

Specify Crop/Livestock	Acres or # of livestock

Mechanization

9) a) Are any of your burley production practices mechanized?

_____ YES _____ NO

b) If yes, please list the mechanical aid used.

- Before harvest _____
- Cutting _____
- Hanging _____
- Stripping _____
- Others _____

10) a) Have you heard of other types of mechanization used in burley production?

_____ YES _____ NO

b) If yes, list the types of mechanization and where you learned about them.

Type of Mechanization	Source of Information

DISCUSSION QUESTIONS

1) By show of hands, who has mechanized a portion of their burley production? Who hasn't?

2) If not mechanized at all:

   a) Why?

   b) What are your barriers to entry?

3) What factors do you consider when deciding to adopt a new technology – mechanized or otherwise?

4) If mechanization already adopted:

   a) What are the benefits?

   b) What are the drawbacks?

5) What type(s) of mechanization are you most interested in?

6) What type(s) of mechanization are you definitely not interested in and why.

Watch Carolina Tobacco Services, Inc. DVD, "Burley Tobacco Stripper Demonstration" from March 2009 (with Dale Hutchins' approval). Add comments about improvements he has made to machine since March 2009.

7) Does the idea of mechanizing the grading process cause you to be concerned about leaf quality, grade distribution and bale integrity?

8) (Depending on answers to question 7 . . .) What do you think the market's reaction will be to this potential change in quality, etc.? Discounted? Receive lower grade and therefore lower prices?

9) a) If mechanized, was labor availability and cost a major reason for adopting your mechanical aid?

b) If not mechanized, was labor availability and cost a major reason for adopting your mechanical aid?

10) (Depending on answers to question 7 . . .) Would/could the labor savings outweigh the loss in quality?

11) Does the risk of the machine breaking down concern you?

a) Could you easily put your crew to work on hand stripping while the grader was being repaired?

b) Would the availability of parts concern you?

c) Are repair costs of great concern to you – or could you or a member of your crew repair the machine easily?

12) If you were contemplating investment in a mechanical grader, how many crop seasons would you be willing to wait for complete payment on your investment?

13) Overall, in which step of the production process do you encounter the most problems?

14) Ignoring all available mechanized tobacco production equipment, where do you think mechanization would be most helpful in your operation?

15) If not using any mechanical stripping aids, what is the likelihood that you will in the future?