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CLEMSON



extension economics report



Tobacco Baling Survey

May 2000

EER 189

clemson university
cooperative extension service

department of agricultural and
applied economics
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EXTENSION ECONOMICS REPORT

Tobacco Baling Survey

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Clemson University
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TABLE OF CONTENTS

| | |
|---|-----|
| THE STUDY | 1 |
| BACKGROUND | 1 |
| GENERAL FARM RESULTS | 2 |
| Table 1. Tobacco Baling Survey Farm Categories | 2 |
| Table 2. Percent of Farm Respondents by Category; Percent of Tobacco Baled by Location; and, Average Harvest Lbs. by Category. | 3 |
| Table 3. Harvesting/Curing Practices - Average Number of Farm Harvests; Harvest Method; and, Type of Curing; by Category. | 3 |
| FARM/WAREHOUSE INITIAL BALING ISSUES | 4 |
| Table 4. How Farm and Warehouse Respondents Received Initial Information on Operating Baler; Percent of Farm Respondents by Category | 4 |
| QUALITY CONTROL PROCEDURES | 5 |
| Table 5. Percent of Farm and Warehouse Respondents Regarding On-Location Control Capability During Baling. | 5-6 |
| BALING EFFECTS ON SPECIFIC SYSTEM FUNCTIONS | 6 |
| Table 6. Rating of How Baling Has Affected Specific System Functions; Farmer; Warehouse; and, Buyer Responses. | 7 |
| QUALITY FACTORS | 8 |
| Figure 1. Tobacco Baling Rating System Functions | 8 |
| Table 7. Bale Vs. Sheets Grading Rating by Farmer, Warehouse, and Buyer (USDA and Own Grades); and, Average Farmer Size Response | 8 |
| Table 8. Moisture/Temperature Problems Rating by Farmer, Warehouse, and Buyer; and, Average Farmer Size Response. | 9 |
| BALING COMMENTS | 10 |
| Table 9. Percent of Farm by Category, Warehouse, and Buyer Respondents Regarding Overall Positive and Negative Baling Comments. | 10 |
| Table 10. Positive Baling Comments by Farmer, Warehouse and Average Farmer Size Response | 11 |
| Table 11. Negative Baling Comments by Farmer, Warehouse and Buyer, Average Farmer Size Response. | 12 |
| Figure 2. Farmer Baling Comments Categories .. | 13 |
| Figure 3. Warehouse Baling Comments Categories.. | 13 |
| Figure 4. Buyer Baling Comments Categories.. | 14 |

TABLE OF CONTENTS

EDUCATIONAL NEEDS 14
 Table 12. Education Needs Comments by Farmer, and, Warehouse; and, Average
 Farmer Size Response 15

SELECTED WAREHOUSE ISSUES 15
 Table 13. Warehouse Baling Responses on Cost Differential; Baling Charges;
 and, Percent Future Baling 16

SELECTED BUYER ISSUES 16
 Table 14. Buyer Baling Responses on Bale Purchases and Cost Differentials . 17

BUYER QUALITY/BALE PROBLEM ISSUES 17
 Table 15. Buyer Baling Responses on Quality; Bale Problems; and, Criteria to
 Make Bales as Good as Sheets. 18

SUMMARY 19

APPENDICES: Appendix A. Farmer Questionnaire - Baling Survey 20
 Appendix B. Warehouse Questionnaire - Baling Survey 21
 Appendix C. Buyers Questionnaire - Flue-Cured Baling Survey 22

ii.
THE STUDY

A study was conducted in December 1999 to investigate the potential market impact of baled flue-cured tobacco. A market survey was constructed to determine both positive and negative implications of this major change to the production/marketing system. All industry sectors were included in this research - - farmers, warehouse operators, and buyers.

A questionnaire was mailed to 2,148 South Carolina producers, all in-state warehouses, and all active flue-cured buyers. The buyers included companies, exporters, and dealers; these were to the leaf departments in each entity. The producer mailing list came from extension county tobacco listings and included producers along with quota holders; only producers were asked to respond.

These questionnaires contained both common information across all sectors and specific questions that were unique for each. The actual questionnaires are shown in Appendices A, B, and C.

There was a second part to each questionnaire which contained general tobacco policy questions. These were the same for everyone. This study was deliberately mailed to be received just after the December 15, 1999 USDA announcement of the 2000 flue-cured quota. This part of the survey is not discussed in this publication.

The response to these mailings was slightly less than 10 percent returned for farmers, around 30 percent for the warehouses, and almost 40 percent for the buyers. Since all mailings were anonymous, there was no chance for follow-up.

BACKGROUND

Flue-cured tobacco baling is a major technology change for the industry. It is the packaging system from the farm, through the marketing system, and to the processing plant. Tobacco can currently be baled at two different locations - - at the warehouse or at the farm. Prior to the bale, all tobacco was packaged, transported, and sold in round, tied sheets of approximately 250 pounds.

This is a new process as there was a small pilot project in 1997 with 18 in-state farmers baling 308 bales (7,200 total bales for flue-cured tobacco). In 1998, there was over 100 million pounds of flue cured tobacco baled with between 400 to 500 balers in operation. Availability of balers was the most limiting resource. Thus, 1999 was the first year this technology was generally applied. For 1999, South Carolina sold 70,196 bales, or over 63 percent of production, while the entire flue-cured belt marketed 535,380 units¹.

The standardization requirements for a flue-cured bale are: dimensions are 42" tall by 42" wide by 40" deep; it must weigh between 650 to 850 lbs.; and, have a moisture content between 12 to 18 percent. The size of this bale is based on transportation and handling conditions. It is reported that nearly all the rest of the world operates with a bale as the common storage system. However, the

¹ Source: AMS/USDA, Market News Service; and Flue-Cured Tobacco Cooperative Stabilization Corporation, "Final Tobacco Bale Report," 2000.

size is generally smaller and this has been a slight issue with some groups. Probably the major difference in size is the handling requirements. Most earlier tobacco bales were small enough so that workers can lift/move by hand whereas the new flue-cure bales require equipment to lift or move.

On-farm baling serves a critical farm operation in removal of tobacco from the curing barn to the package that will be transported and utilized with the selling process. This is strategic at the farm level, not only from the standpoint of labor demand, but primarily because this is the only place where the product can be “cleaned” by removing foreign matter and off-character leaf; this has an important impact on the final quality of the tobacco.

GENERAL FARM RESULTS

Data for the farm sector was divided into seven categories by size (table 1). These were based on 1999 harvested pounds while calculated equivalent acres are also reported.

Table 1. Tobacco Baling Survey Farm Categories.

| <i>Category</i> | <i>Symbol or Size</i> | <i>Minimum Lbs.</i> | <i>Maximum Lbs.</i> | <i>Approx. Min. Acres*</i> | <i>Approx. Max. Acres*</i> |
|-----------------|---------------------------|-------------------------|-------------------------|--------------------------------|--------------------------------|
| 1 | 0-15 | 0 | 15,000 | 0.0 | 7.5 |
| 2 | 15-25 | 15,001 | 25,000 | 7.5 | 12.5 |
| 3 | 25-50 | 25,001 | 50,000 | 12.5 | 25.0 |
| 4 | 50-100 | 50,001 | 100,000 | 25.0 | 50.0 |
| 5 | 100-250 | 100,001 | 250,000 | 50.0 | 125.0 |
| 6 | 250-500 | 250,001 | 500,000 | 125.0 | 250.0 |
| 7 | 500 + | 500,001 | and over | 250.0 | over |

* Approximate acres were obtained by assuming 2,000 lbs. per acre.

A general summary of the surveyed farm operations is reported in table 2. The percent of producers by size category and production was largest for the 100-250 size with the 50-100 size being the second largest. There was no on-farm baling in the 0-15 size while this percent increased as average size became larger. Overall, the smallest size operators tended to not bale as only 7.2 percent of these baled at the warehouse. Warehouse baling was largest for the 25-50 size with the largest, 500+ size, being next.

Table 2. Percent of Farm Respondents by Category; Percent of Tobacco Baled by Location; and, Average Harvest Lbs. by Category.

| Category | Size | Respondents Percent | Bale | Bale | Not | Average Harvest Lbs. |
|----------|---------|------------------------|------------------|--------------------|----------------|----------------------------|
| | | | On Farm ----- | Warehouse ----- | Baled ----- | |
| 1 | 0-15 | 11.1 | 0.0 | 7.2 | 92.8 | 9,790 |
| 2 | 15-25 | 9.6 | 17.5 | 20.1 | 62.4 | 19,630 |
| 3 | 25-50 | 11.9 | 12.2 | 27.8 | 60.1 | 37,875 |
| 4 | 50-100 | 20.7 | 41.5 | 18.8 | 39.8 | 78,028 |
| 5 | 100-250 | 33.3 | 69.8 | 10.9 | 19.3 | 168,378 |
| 6 | 250-500 | 10.4 | 77.3 | 14.5 | 8.2 | 341,214 |
| 7 | 500 + | 3.0 | 70.8 | 25.0 | 4.3 | 760,000 |

Table 3 contains the results of the average harvesting and curing practices by size category. The first column of this table, "Average Number of Harvests" is an important issue with our producers and the industry. Recently, buyers have been advocating that this state does not generally harvest by stalk position (3 to 4 times) and this has had a negative impact on our quality. Because of this and bad weather, South Carolina had the highest percent of 1999 flue-cured production that did not sell and was placed in the Stabilization cooperative. The respondents reported that as size increased, the average number of harvests tended to decline. The smallest size operators averaged 3.68 harvests while the largest averaged 2.75 harvests.

Table 3. Harvesting/Curing Practices - Average Number of Farm Harvests; Harvest Method; and, Type of Curing; by Category.

| Category | Size | Average Number Harvests | ---- Harvest Method ---- | | | ---- Curing Type ---- | | |
|----------|---------|-------------------------------|--------------------------|------|------|-----------------------|-------|------|
| | | | Machine | Hand | Both | Racks | Boxes | Both |
| | | | ----- Percent ----- | | | ----- Percent ----- | | |
| 1 | 0-15 | 3.68 | 42.9 | 50.0 | 7.1 | 50.0 | 42.9 | 7.1 |
| 2 | 15-25 | 3.42 | 61.5 | 30.8 | 7.7 | 46.2 | 38.5 | 15.4 |
| 3 | 25-50 | 3.22 | 81.3 | 12.5 | 6.3 | 31.3 | 50.0 | 18.8 |
| 4 | 50-100 | 3.25 | 67.9 | 25.0 | 7.1 | 28.6 | 57.1 | 14.3 |
| 5 | 100-250 | 3.05 | 81.8 | 13.6 | 4.5 | 2.3 | 79.5 | 18.2 |
| 6 | 250-500 | 3.14 | 78.6 | 7.1 | 14.3 | 7.1 | 64.3 | 28.6 |
| 7 | 500 + | 2.75 | 25.0 | 25.0 | 50.0 | 25.0 | 25.0 | 50.0 |

The harvest method (also in table 3) tended to increase for machine harvest up to the largest

category. Likewise, hand harvest tended to decline. One-half of the largest size operations utilized both machine and hand systems while the proportion of these is unknown. It is thought that the larger units tended to keep more full-time labor and by this combination of harvest systems, could better utilize full-time labor. The type of curing system was similar to harvest method with boxes generally increasing up to the largest system with racking declining. Again, 50 percent of the largest size categories reported that they made use of both systems. This was also likely tied to the labor issue.

FARM/WAREHOUSE INITIAL BALING ISSUES

The question regarding the brand/model of baler, number, and capacity of baler was generally not filled-in by respondents as it seemed that many were unsure of these. For those responding, most of the popular names of balers were listed. There were also several answers of “borrowed.” A few farmers reported operating “homemade” balers with two of these respondents also stating they had obtained their information from baler companies.

The initial information on operating a baler is described in table 4. For the producers, over 39 percent learned on their own while nearly 32 percent relied on company data; over 20 percent of farmers also utilized other farmers as a source of data. Most of the warehouse operators utilized baler company information (62.5 percent) with the rest of the information coming from learning on their own. Less than 2 percent of farmers reported the warehouse as a source of information while extension was only 6.5 percent for the farmers and no warehouse used them.

Table 4. How Farm and Warehouse Respondents Received Initial Information on Operating Baler; Percent of Farm Respondents by Category.

| Category | Size | Learn On Own | Baler <u>Co.</u> | Extension Info. | Other Farmers | Learn From Warehouse |
|---------------------|---------|-----------------|---------------------|--------------------|------------------|-------------------------|
| ----- Percent ----- | | | | | | |
| 1 | 0-15 | -- | -- | -- | -- | -- |
| 2 | 15-25 | 16.7 | 33.3 | 0.0 | 50.0 | 0.0 |
| 3 | 25-50 | 40.0 | 20.0 | 0.0 | 40.0 | 0.0 |
| 4 | 50-100 | 41.7 | 29.2 | 0.0 | 25.0 | 4.2 |
| 5 | 100-250 | 39.6 | 35.4 | 6.3 | 18.8 | 0.0 |
| 6 | 250-500 | 50.0 | 27.8 | 16.7 | 0.0 | 5.6 |
| 7 | 500 + | 16.7 | 33.3 | 16.7 | 33.3 | 0.0 |
| Total Farms | | 39.3 | 31.8 | 6.5 | 20.6 | 1.9 |
| Warehouses | | 37.5 | 62.5 | 0.0 | 0.0 | -- |

QUALITY CONTROL PROCEDURES

Table 5 contains the farm and warehouse summary of on-location baling quality control. For both the belt and bench methods of picking, size of farm operation was important; as size increased, so did the use of either method. All warehouses reported the use of either a belt or bench.

Likewise, removal of foreign matter/off-character tobacco was utilized more by larger operations while all warehouses reported either a “yes” or “some.” Generally, efforts to remove stalks, grass, and weeds was very high except in the 15-25 farm size reporting 20 percent in the “some” category. Warehouses reported 28.6 percent in this “some” response but one must consider that most cleaning is normally done when tobacco is taken from the barn and should be reported at the farm level.

Most farmers did not use a moisture meter/other moisture device except in the largest, 500+ size units. Over 71 percent of the warehouses used moisture meters.

Table 5. Percent of Farm and Warehouse Respondents Regarding On-Location Control Capability During Baling.

A. Use of Conveyor Belt or Bench For Picking:

| Category | Size | Belt | Bench | No |
|------------|---------|---------------------|-------|-------|
| | | ----- Percent ----- | | |
| 1 | 0-15 | -- | -- | -- |
| 2 | 15-25 | 0.0 | 0.0 | 100.0 |
| 3 | 25-50 | 0.0 | 0.0 | 100.0 |
| 4 | 50-100 | 12.5 | 6.3 | 81.3 |
| 5 | 100-250 | 13.5 | 18.9 | 67.6 |
| 6 | 250-500 | 16.7 | 25.0 | 58.3 |
| 7 | 500 + | 50.0 | 50.0 | 0.0 |
| Total Farm | | 13.9 | 16.5 | 69.6 |
| Warehouse | | 57.1 | 42.9 | 0.0 |

B. Operation Allow For Removal of Foreign Matter/Off-Character Tobacco.

| Category | Size | Yes | No | Some |
|------------|---------|-------|------|------|
| 1 | 0-15 | -- | -- | -- |
| 2 | 15-25 | 40.0 | 0.0 | 60.0 |
| 3 | 25-50 | 60.0 | 20.0 | 20.0 |
| 4 | 50-100 | 64.7 | 5.9 | 29.4 |
| 5 | 100-250 | 78.4 | 2.7 | 18.9 |
| 6 | 250-500 | 91.7 | 0.0 | 8.3 |
| 7 | 500 + | 100.0 | 0.0 | 0.0 |
| Total Farm | | 75.0 | 3.8 | 21.3 |
| Warehouse | | 85.7 | 0.0 | 14.3 |

Table 5. (Cont'd)

C. Effort to Remove Stalks, Grass, Weeds.

| Category | Size | Yes | No | Some |
|------------|---------|-------|-----|------|
| 1 | 0-15 | -- | -- | -- |
| 2 | 15-25 | 80.0 | 0.0 | 20.0 |
| 3 | 25-50 | 100.0 | 0.0 | 0.0 |
| 4 | 50-100 | 94.1 | 0.0 | 5.9 |
| 5 | 100-250 | 100.0 | 0.0 | 0.0 |
| 6 | 250-500 | 100.0 | 0.0 | 0.0 |
| 7 | 500 + | 100.0 | 0.0 | 0.0 |
| Total Farm | | 97.5 | 0.0 | 2.5 |
| Warehouse | | 71.4 | 0.0 | 28.6 |

D. Use a Moisture Meter/Other Moisture Device.

| Category | Size | Yes | No | Some |
|------------|---------|------|------|------|
| 1 | 0-15 | -- | -- | -- |
| 2 | 15-25 | 20.0 | 80.0 | 0.0 |
| 3 | 25-50 | 16.7 | 66.7 | 16.7 |
| 4 | 50-100 | 35.3 | 52.9 | 11.8 |
| 5 | 100-250 | 13.5 | 83.8 | 2.7 |
| 6 | 250-500 | 16.7 | 75.0 | 8.3 |
| 7 | 500 + | 50.0 | 50.0 | 0.0 |
| Total Farm | | 21.0 | 72.8 | 6.2 |
| Warehouse | | 71.4 | 28.6 | 0.0 |

BALING EFFECTS ON SPECIFIC SYSTEM FUNCTIONS

Table 6 is a farm, warehouse, and buyer summary of questions on rating baling. Some questions go across all sectors while others apply to one or two of the sectors. It should be kept in mind that not all questions mean the same to each sector; for example, the efficiency of handling is completely different to the producer as compared to the warehouse or the buyer.

The rankings were: 1= Worse/Major; 2= Worse/Minor; 3 = Same/None; 4= Better/Minor; and, 5= Better/Major with the category of "uncertain" not being included. A mean response rating of "3" was considered as neutral with the lower values being negative while the higher values were positive. The first question, "Presentation/Integrity" was not asked appropriately as it became obvious with the answers that some interpreted this to refer to the general appearance of the exterior package while others responded on the basis that it only dealt with the interior of the package. The warehouses and buyers more often than not referenced the make-up or interior and was negative in their reply.

The two most positive responses by all sectors regarded handling and labor. Other positive functions included auction and pricing while both the farmer and warehouse gave weighing a positive rating.

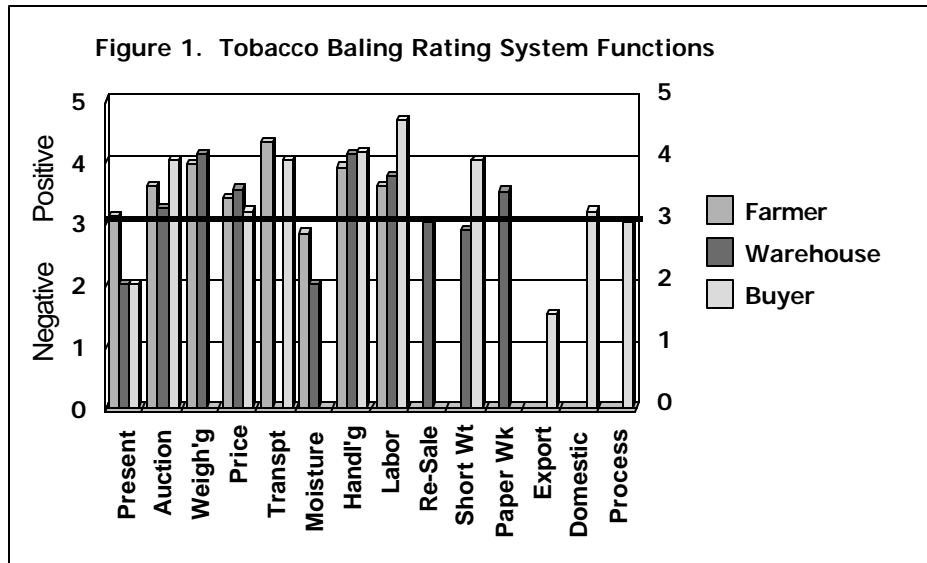
Table 6. Rating of How Baling Has Affected Specific System Functions; Farmer; Warehouse; and, Buyer Responses.

| Question | Symbol | Farmer | Warehouse | Buyer |
|---------------------------------|----------|--------|-----------|-------|
| ---- mean response ranking ---- | | | | |
| PRESENTATION/INTEGRITY | Present | 3.11 | 2.00 | 2.00 |
| AUCTION | Auction | 3.60 | 3.22 | 4.00 |
| WEIGHING | Weigh'g | 3.95 | 4.13 | |
| PRICING | Price | 3.42 | 3.57 | 3.20 |
| TRANSPORTATION | Transpt | 4.30 | | 4.00 |
| MOISTURE/TEMPERATURE | Moisture | 2.83 | 2.00 | |
| HANDLING | Handl'g | 3.91 | 4.13 | 4.17 |
| LABOR | Labor | 3.58 | 3.75 | 4.67 |
| RESALE | Re-Sale | | 3.00 | |
| SHORT WEIGHTS/LOSSAGE | Short Wt | | 2.89 | 4.00 |
| PAPER WORK | Paper Wk | | 3.50 | |
| EXPORT CUSTOMERS | Export | | | 1.50 |
| DOMESTIC PURCHASES | Domestic | | | 3.20 |
| PROCESSING | Process | | | 3.00 |

Note: 1 = Worse / Major; 2 = Worse / Minor; 3 = Same /None; 4 = Better / Minor; 5 = Better / Major. The category of "Uncertain" was not included.

Moisture/temperature was negative for both farm and warehouse sectors. The question regarding short weights/lossage was slightly negative for the warehouses but positive for the buyers.

Buyers rated baling as having the potential negative impact on the export customer. Some respondents indicated that it was an acceptance and/or learning issue which would take time to solve. In general, the actual “doing and handling” of baling was rated as positive while those functions regarding quality and acceptance was negative or less positive. Figure 1 is a graphic presentation of table 6.



QUALITY FACTORS

The next two tables deal with grading and moisture/temperature issues. The bale vs. sheet grading rating (table 7) was interesting. During the past tobacco marketing season, there was much discussion regarding problems with USDA grading bales. For the most part, farmers were surprisingly near neutral (over 42 percent rated grading the same; 32 percent as worse and 26 percent as better.) The warehousemen rated USDA grading of bales as 67 percent worse than sheets and 11 percent as better. The buyers rated USDA grading as 50 percent the same with 33 percent worse. For the buyers own grades, they rated 83 percent as same and 17 percent worse.

Table 7. Bale Vs. Sheets Grading Rating by Farmer, Warehouse, and Buyer (USDA and Own Grades); and, Average Farmer Size Response.

| Rating | Average Size Cat. | Response Percent |
|----------------------------|-------------------|------------------|
| Farmer | | |
| Better | 3.9 | 25.8 |
| Same | 4.2 | 42.4 |
| Worse | 3.9 | 31.8 |
| Warehouse | | |
| Better | -- | 11.1 |
| Same | -- | 22.2 |
| Worse | -- | 66.7 |
| Buyer - USDA Grades | | |
| Better | -- | 16.7 |
| Same | -- | 50.0 |
| Worse | -- | 33.3 |
| Buyer - Own Grades | | |
| Better | -- | 0.0 |
| Same | -- | 83.3 |
| Worse | -- | 16.7 |

The moisture/temperature item rating was reported in table 8. Some 57 percent of producers rated

this as a non-issue while 32 percent thought it was minor and nearly 11 percent perceived it as major. Almost 78 percent of warehouses believed this to be minor while 100 percent of the buyers expressed this as a minor problem. In response to the number of bales rejected due to moisture/temperature, 23.5 percent of the farmers had at least one bale rejected while over two-thirds of the warehouses reported rejected bales. Although the actual number of bales rejected response was suspect (some reporting more than their total production) while the general range was between one to eight bales. Based on the buyer and warehouse comments (and several farmers), there is need for improvement in this area.

Table 8. Moisture/Temperature Problems Rating by Farmer, Warehouse, and Buyer; and, Average Farmer Size Response.

| Rating | Average Size Cat. | Response Percent |
|-----------|-------------------|------------------|
| Farmer | | |
| Major | 4.2 | 10.6 |
| Minor | 4.7 | 31.9 |
| None | 4.4 | 57.4 |
| Warehouse | | |
| Major | -- | 11.1 |
| Minor | -- | 77.8 |
| None | -- | 11.1 |
| Buyer | | |
| Major | -- | 0.0 |
| Minor | -- | 100.0 |
| None | -- | 0.0 |

A survey question, “If you bale, do you present your tobacco different because of your name on the tag?” was only answered “yes” by 6 percent of the farmers. Among the reasons were: “The Tag ID’s Me,” and “It May Determine a Future Contract.”

The inquiry about on-farm accidents had a very low response; Two farmers reported “near accidents” while six others answered that they had “minor accidents.” No warehouses reported any accidents.

BALING COMMENTS

Open ended questions were asked in the form: “Comments: major strong points/ problems relating to baling?” These were categorized according to positive and negative, and subject content. The raw count of comments are presented in table 9. Farm size categories of 4, 5, and 6 were more positive while the smaller and larger groups were more negative. This is probably related to the fact that these groups did more on-farm baling. The total farm comments were about even for positive and negative comments. The warehouse negative comments accounted for more than 70 percent of responses but still less than three farm categories (0-15, 25-50, and 500 +). Buyers were slightly negative with over 54 percent in this category.

Table 9. Percent of Farm by Category, Warehouse, and Buyer Respondents Regarding Overall Positive and Negative Baling Comments.

| Category | Size | Positive Comments | Negative Comments |
|------------|---------|----------------------|----------------------|
| | | <i>Percent</i> | <i>Percent</i> |
| 1 | 0-15 | 20.0 | 80.0 |
| 2 | 15-25 | 43.8 | 56.3 |
| 3 | 25-50 | 20.0 | 80.0 |
| 4 | 50-100 | 66.7 | 33.3 |
| 5 | 100-250 | 61.9 | 38.1 |
| 6 | 250-500 | 53.3 | 46.7 |
| 7 | 500 + | 25.0 | 75.0 |
| Total Farm | | 50.3 | 49.7 |
| Warehouse | | 29.6 | 70.4 |
| Buyers | | 45.8 | 54.2 |

The positive baling comments are summarized in table 10. For farmers, the category of handling was the most popular, while hauling, labor and storage followed. From the size response, the storage savings was more useful to smaller operations while the larger sizes tended to like baling and/or it better fit the operation. The top three warehouse categories were labor, size/floor space, and better floor presentation. For the buyers, the comments of handling, labor, and less green storage were the most important.

Table 10. Positive Baling Comments by Farmer, Warehouse and Average Farmer Size Response.

| Comment | Average Size Cat. | Response Percent |
|----------------------------|-------------------|------------------|
| Farmer | | |
| Handling | 4.5 | 30.0 |
| Hauling | 4.3 | 18.8 |
| Less Labor | 4.1 | 13.8 |
| Storage | 3.9 | 12.5 |
| Like Baling/Fits Operation | 5.3 | 7.5 |
| Efficient | 4.8 | 6.3 |
| Loading | 5.0 | 2.5 |
| Tagging System | 5.0 | 2.5 |
| Time Saving | 5.0 | 2.5 |
| Better Floor Presentation | 4.0 | 1.3 |
| Curing Barn Remove | 5.0 | 1.3 |
| Waste Is Less | 5.0 | 1.3 |
| Warehouse | | |
| Less Labor | -- | 37.5 |
| Size/Floor Space | -- | 25.0 |
| Better Floor Presentation | -- | 12.5 |
| Efficient | -- | 12.5 |
| Handling | -- | 12.5 |
| Buyer | | |
| Handling | -- | 27.3 |
| Less Labor | -- | 27.3 |
| Less Green Storage | -- | 18.2 |
| Direct Recourse w/Farmer | -- | 9.1 |
| Efficient | -- | 9.1 |
| Like Baling/Fits Operation | -- | 9.1 |

The negative baling comments (table 11) seemed to be more variable than the positive section. Farmers rated “price no premium” as the first issue. The second most common comment about “costs and equipment outlay” tended to be more important to the smaller operations. In addition, smaller farm units rated issues such as “size of operation,” “helps company or warehouse,” “dislike/does not fit operation,” and, “slip sheet problems” as significant. The larger operations listed “bales split barns,” “no farm scales,” “quality storage problems,” “curing barn remove,” and, “no advantage.” A few farmers complained that baling increased harvest time – they could well have undersized baler capacity.

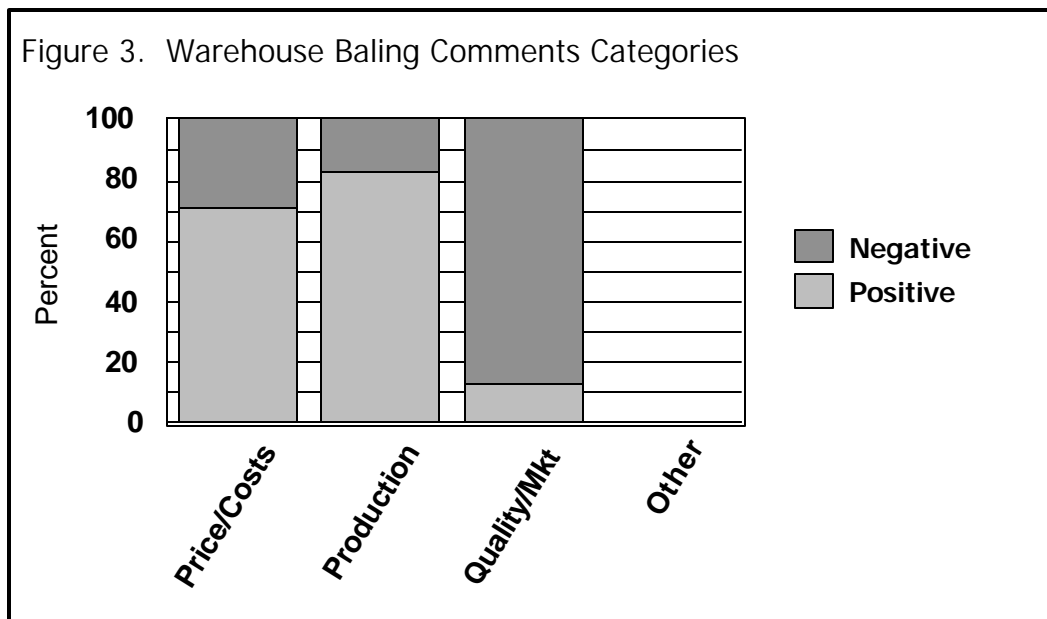
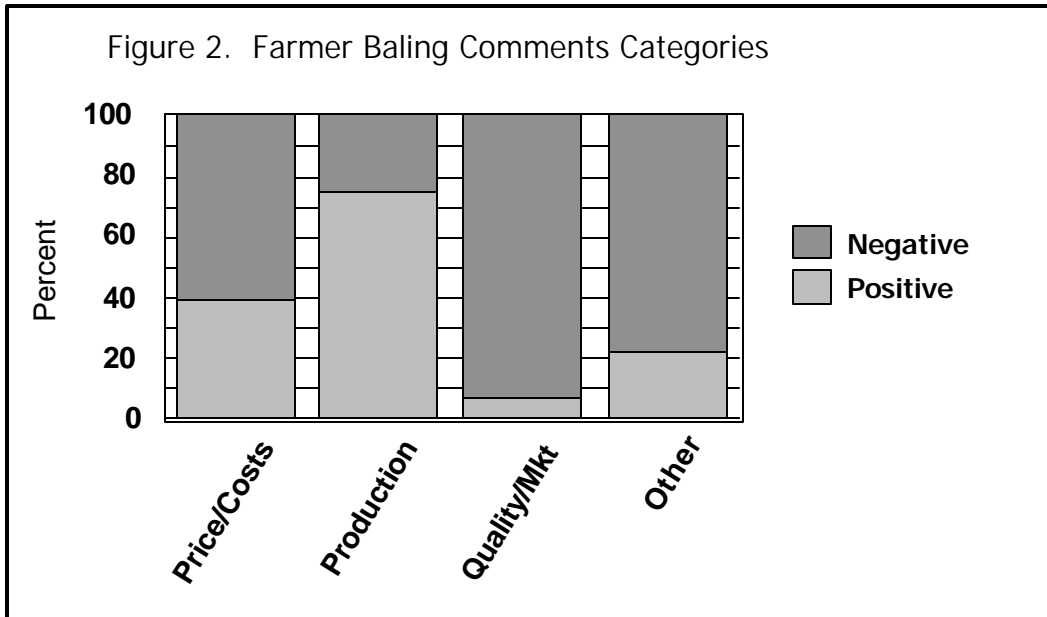
The top issues with the warehouses were: “grading,” “nesting/mixing,” “internal bale problems,” and, “slip sheet problems.” Buyers listed “mixed stalk position,” “nesting/mixing,” and “tag bale on the farm” as their priorities.

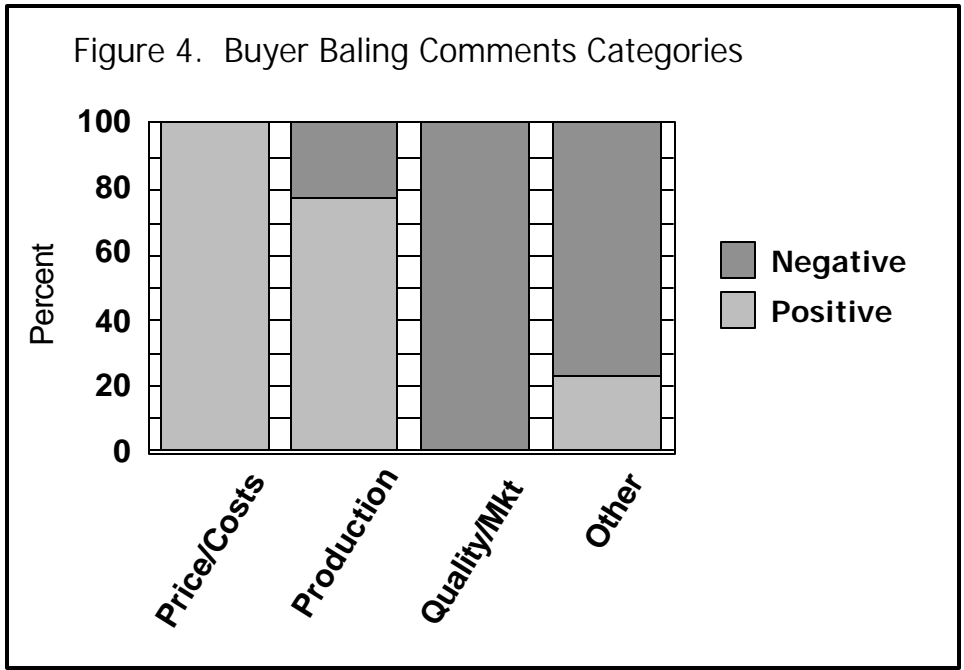
Table 11. Negative Baling Comments by Farmer, Warehouse and Buyer, Average Farmer Size Response.

| Comment | Average Size Cat. | Response Percent |
|---------------------------------|-------------------|------------------|
| Farmer | | |
| Price No Premium | 4.3 | 15.4 |
| Costs & Equipment Outlay | 3.2 | 12.8 |
| Moisture & Moisture/Temperature | 4.9 | 10.3 |
| Grading | 4.6 | 9.0 |
| Cost Increased | 4.6 | 6.4 |
| Lower Stalk Moisture/Temp | 4.8 | 6.4 |
| Size of Operation | 1.4 | 6.4 |
| Time Increased | 4.6 | 6.4 |
| Helps Company or Warehouse | 2.3 | 5.1 |
| Nesting / Mixing | 3.3 | 3.8 |
| Bales Split Barns | 5.5 | 2.6 |
| Dislike/Does Not Fit Operation | 2.0 | 2.6 |
| No Farm Scales | 5.0 | 2.6 |
| Presentation Problems | 4.0 | 2.6 |
| Quality Storage Problems | 5.5 | 2.6 |
| Curing Barn Remove | 5.0 | 1.3 |
| No Advantage | 5.0 | 1.3 |
| Slip Sheet Problems | 2.0 | 1.3 |
| Storage Problems | 4.0 | 1.3 |
| Warehouse | | |
| Grading | -- | 26.3 |
| Nesting / Mixing | -- | 26.3 |
| Internal Bale Problems | -- | 10.5 |
| Slip Sheet Problems | -- | 10.5 |
| Moisture & Moisture/Temperature | -- | 5.3 |
| Weight Loss Lower Stalk | -- | 5.3 |
| Price No Premium | -- | 5.3 |
| No Farm Scales | -- | 5.3 |
| Presentation Problems | -- | 5.3 |
| Buyer | | |
| Mixed Stalk Position | -- | 23.1 |
| Nesting / Mixing | -- | 15.4 |
| Tag Bale On Farm | -- | 15.4 |
| Baling Wire Difficult to Remove | -- | 7.7 |
| Industry Wide Acceptance Issues | -- | 7.7 |
| Internal Bale Problems | -- | 7.7 |
| Lack of Customer Uniformity | -- | 7.7 |
| No Farm Scales | -- | 7.7 |
| Smaller Bale Size | -- | 7.7 |

A further analysis was made on the above comments by categorizing the negative and positive comments according to their function. These functions were: price/costs, production, quality/marketing, and other. The “other” function was a response that did not fit into the first three groups.

Figures 2, 3, and 4 are a presentation of these results. In the farmer section, price/costs comments were about 60 percent negative, production was 75 percent positive, quality/marketing was 95 percent negative, and, other was near 80 percent negative.





For warehouses, price/costs were 70 percent positive, production was more than 80 percent positive, and quality/marketing was 87 percent negative. From the buyers standpoint, price/costs were 100 percent positive, production was almost 80 percent positive, quality/marketing was 100 percent negative, while other was near 80 percent negative. This should not be taken to mean that buyers (or any other sector) are totally positive about price/ costs or totally negative about quality/marketing. For example, most buyer statements about quality indicated the need for improvement.

From an industry viewpoint, it seems that baling is much like any other new technology. The early adoption stage is usually one where the operator is most concerned with the mechanics or process rather than quality and/or fine points. These normally follow as users become more comfortable with the change and finer points are worked out. This seems to be case for baling.

EDUCATIONAL NEEDS

Results of the educational need question are shown in table 12. Nearly 30 percent of farmer response concerned the best baling method. This was expressed by several producers from the standpoint of capital outlay and effort with baling, and then they felt there was a lack of ability to communicate quality to the grader and buyer. The second highest farmer priority (18.5 percent) was moisture issues research/education.

Warehousemen, like the producers, listed the best baling method as the top educational need. This was followed by grading bale education, slip sheet improvement, and one method decision. With the exception of moisture issues, the warehouse and farmer lists were similar; one may note that warehouse operators earlier discussed moisture but failed to list it as an educational need.

Table 12. Education Needs Comments by Farmer, and, Warehouse; and, Average Farmer Size Response.

| | Average Size Cat. | Response Percent |
|---------------------------------|----------------------|---------------------|
| Farmer | | |
| Best Baling Method | 3.9 | 29.6 |
| Moisture Issues | 4.4 | 18.5 |
| Uniform Industry Support | 4.0 | 7.4 |
| Grading Bale Education | 6.0 | 7.4 |
| Improve Slip Sheet | 3.5 | 7.4 |
| None | 3.5 | 7.4 |
| One Method Decision | 4.0 | 3.7 |
| Tag System Improvement Research | 5.0 | 3.7 |
| Feeding Knotting Wire | 5.0 | 3.7 |
| Nitrosamine Research | 6.0 | 3.7 |
| Agronomic Issues | 6.0 | 3.7 |
| Unknown | 1.0 | 3.7 |
| Warehouse | | |
| Best Baling Method | -- | 40.0 |
| Grading Bale Education | -- | 20.0 |
| Improve Slip Sheet | -- | 20.0 |
| One Method Decision | -- | 20.0 |

SELECTED WAREHOUSE ISSUES

Table13 contains results of the unique warehouse questions. The cost differential of handling bales vs. sheets was generally in the “0 to 5 % Less” group. There was a relatively wide range of response to this as warehouses may be in the learning process of handling bales.

The warehouse charges for baling was reported to be \$.040 per pound by almost 86 percent, with the others charging \$.035 per pound. The last question, the percent of crop baled in the future, indicated that warehouse operators believe that baling will be (or already is) the standard package. For the percent of baling in the future, their responses averaged 76 percent for next year; 90 percent two years from now; and, nearly 97 percent in three years.

Table 13. Warehouse Baling Responses on Cost Differential; Baling Charges; and, Percent Future Baling.

| Comment | Response <i>percent</i> |
|---|----------------------------|
| A. Warehouse Cost Differential of Handling Bales vs. Sheets | |
| + 10% Less | 9.1 |
| 5-10% Less | 24.2 |
| 0-5 % Less | 36.4 |
| Same | 24.2 |
| 5-10% More | 6.1 |
| B. Warehouse Charges for Baling | |
| Charge = \$.035 per Lb. | 14.3 |
| Charge = \$.040 per Lb. | 85.7 |
| C. Percent of South Carolina Crop Baled In: (Given just over 60 % in 1999) | |
| Next Year: | 76.1 |
| Two Years in the Future: | 90.0 |
| Three Years in the Future: | 96.6 |

SELECTED BUYER ISSUES

Buyer responses on bale purchases and cost differentials are outlined in table 14. All buyers replied that they purchased bales in 1999. They also reported that 57 percent paid a premium on at least some bales. Most buyers (87.5 percent) did not have goals or limits on the quantity of bales purchased while those who reported having goals ranged between 40 to 70 percent. One answered that they exceeded their bale purchase goal.

Two questions were asked buyers regarding cost differentials. First, the cost differential of in-house handling was reported to be at least 5 percent less by 67 percent of the purchasers. The cost differential for transporting bales was mixed. One-third reported that transportation costs were 5-10 percent less while one-half rated this as the same; almost 17 percent classified their costs in the 0-5 percent less category.

Table 14. Buyer Baling Responses on Bale Purchases and Cost Differentials

| Comment | Response Yes | Response No |
|--|-------------------|----------------|
| | <i>percent</i> | <i>percent</i> |
| Buyer Purchases | | |
| Purchase 1999 Flue-Cured Bales | 100.0 | 0.0 |
| Pay a Premium on Bales | 57.1 | 42.9 |
| Have Goals/Limits on Quantity of Bales | 12.5 | 87.5 |
| For Buyers who had Goals/Limits, Range | 40.0 to 70.0 pct. | |

| Comment | Response |
|---|----------------|
| | <i>percent</i> |
| Buyer Cost Differentials | |
| Cost Differential of In-House Handling | |
| + 10 percent less | 33.3 |
| 5-10 percent less | 33.3 |
| 0-5 percent less | 16.7 |
| Same | 16.7 |
| Cost Differential of Transporting Bales | |
| + 10 percent less | 0.0 |
| 5-10 percent less | 33.3 |
| 0-5 percent less | 16.7 |
| Same | 50.0 |

BUYER QUALITY/BALE PROBLEM ISSUES

Table 15 is a brief analysis of buyer responses about quality and bale problem issues. Nearly all buyers answered the quality question in-depth. This summarization probably does not do justice to their comments. The top three ratings were: "Harvested by Stalk Position," "Ripeness," and "Cleanliness/Free From Foreign Material." The next three replies were: "Uniformity of Color/Stalk Position/Leaf," "High Percent of Usable Leaf," and "Moisture/Temperature Within an Acceptable Range." The last category, "More Than Two Harvests" could be included in the first group. Overall, the buyers were very consistent in their responses. This list should be studied and utilized by the industry.

The next section of this table was regarding how baling will affect quality. Since these replies were so diverse, mathematical means were not calculated. The two most common responses were that if baling were done properly, it should not affect quality, and, as farmers become more familiar,

baling problems will become less. In general, the buyers were very positive about the producers and their ability to solve these initial technology issues.

The last section related to what it would take for bales to be as good as sheets. Again, data were not calculated for this question. Most of the responses were a recapitulation of the above statements.

Table 15. Buyer Baling Responses on Quality; Bale Problems; and, Criteria to Make Bales as Good as Sheets.

| Comment | Rank * |
|--|--------|
| A. Quality Factors: | |
| Harvested by Stalk Position | 1 |
| Ripeness | 2 |
| Cleanliness/Free From Foreign Material | 3 |
| Uniformity of Color/Stalk Position/Leaf | 4 |
| High Percent of Usable Leaf | 5 |
| Moisture/Temp. Within Acceptable Range | 6 |
| More Than Two Harvests | 7 |
| B. How Will Baling Affect Quality: | |
| Should Not Affect Quality | 1 |
| Less as Farmers Become Familiar | 2 |
| None, If Done Properly | 3 |
| Help if Stop Warehouse Baling | 4 |
| Difficult to Recognize Foreign Material | 5 |
| More Inconsistent in Quality Areas | 6 |
| Difficult to Recognize Nesting/Mixed | 7 |
| Difficult to Recognize Uniformity | 8 |
| Comment | Rank * |
| C. If Bale Problems, What It Would Take for Bales to be as Good as Sheets: | |
| Guarantee Integrity of Bale | 1 |
| Better Auction Spacing for Viewing | 2 |
| None, If Done Properly | 3 |
| Better Capability to Inspect Entire Bale | 4 |
| More Accurate Moisture/Temp. Measure | 5 |

* Note: Percentage data for these questions not shown; only rank reported.

SUMMARY

This was a very informative study about an important, new technology that is having a significant impact on all sectors of the flue-cured tobacco industry. It was based on farmer, warehouse, and buyer survey data to investigate the potential market impact of baled flue-cured tobacco. For the overall industry, baling responses were much like any other new technology. In general, baling was reported to be more efficient but farmers were likely more involved with the process rather than quality and/or fine points. Quality and moisture issues should start to be resolved as users become more comfortable with this change and finer points become finalized. Warehousemen generally reported that baling was more efficient for their operation but they had concerns about quality, grading, and moisture. Overall, buyers were usually positive about baling except with the export issue. Based on this study, the bale seems to be the standard package of the future although there remains a good deal of work to be done in these above important areas.

APPENDICES

Appendix A. Farmer Questionnaire - Baling Survey

1. What percent of your 1999 crop was baled on-farm _____%; warehouse _____%
2. Approx. pounds you harvested this year? _____ LBS
3. If you own a baler: Brand/model _____ Number: ____; Capacity: ____ bales / hr
4. Harvesting/Curing Practices:

Method of harvesting (Machine ____; Hand ____) Number of times _____

Type of curing (Racks ____; Boxes____)
5. If you bale on-farm, how did you initially figure-out how to do this?

Learned on own _____ Baler Co. info. _____ Extension _____

Other Farmer(s) _____ Other _____
6. If you bale on-farm:
 - A. Do you use a conveyor belt (____) or bench (____) or none (____) for picking?
 - B. Will operation allow any option for removal of foreign matter & off-character tobacco?

Yes ____ No ____ Some ____ Unknown ____
 - C. Do you make an effort to remove stalks, grass, weeds? Yes ____ No ____ Sometimes ____
 - D. Use a moisture meter or other device for moisture? Yes ____ No ____ Sometimes ____
7. Whether you bale or not, how will/has baling affected the following (CHECK ONE PER LINE):

| | <i>Worse/ Major</i> | <i>Worse/ Minor</i> | <i>Same/ None</i> | <i>Better/ Minor</i> | <i>Better/ Major</i> | <i>Unknown</i> |
|---------------------------|-------------------------|-------------------------|-----------------------|--------------------------|--------------------------|----------------|
| Presentation/Integrity | _____ | _____ | _____ | _____ | _____ | _____ |
| Auction process | _____ | _____ | _____ | _____ | _____ | _____ |
| Weighing | _____ | _____ | _____ | _____ | _____ | _____ |
| Price (vs. Sheets) | _____ | _____ | _____ | _____ | _____ | _____ |
| Transporting to Mkt | _____ | _____ | _____ | _____ | _____ | _____ |
| Moisture/Heating Problems | _____ | _____ | _____ | _____ | _____ | _____ |
| Handling on-farm | _____ | _____ | _____ | _____ | _____ | _____ |
| Labor | _____ | _____ | _____ | _____ | _____ | _____ |
8. If you bale, do you present your tobacco different because of your name on the tag? Yes ____ No ____
If yes, how? _____
9. Comparing bales to sheets, do you feel that grading bales is: Better ____ Same ____ Worse ____
10. If you bale on-farm, number of 1999 accidents due to baling? None ____ Near ____ Minor ____ Major ____
11. 1999 bales rejected due to temperature/moisture? ____ Num; Is this problem Major ____ Minor ____ None ____
12. Comments: major strong points/problems relating to baling?

13. Comments: educational/research needs?

<please see reverse side for general questions>

Appendix B. Warehouse Questionnaire - Baling Survey

1. Percent of 1999 sales baled by: Farmers ____%; Your Warehouse ____%; Other ____%
2. If you own a baler: Brand/model _____ Number: ____; Capacity: ____ bales/hr
3. What is the cost differential of handling bales as compared to sheets (CHECK ONE)?
 +10% Less ____ 5-10% Less ____ 0-5% Less ____ Same ____ 0-5% More ____ 5-10% More ____ +10% More ____
4. If you bale, what do you charge? _____ / lb.
5. Just over 60 % of the S.C. crop was baled. What percent of our crop will be baled next year? _____ %
 Percent baled in 2 years? _____% Percent baled in 3 years? _____%
5. If you bale, how did you/your employees initially figure-out how to do this?
 Learned on own _____ Baler Co. info. _____ Extension _____
 Other Whse(s) _____ Other _____
6. If you bale:
 - A. Do you use a conveyor belt (____) or bench (____) or none (____) for picking?
 - B. Will operation allow any option for removal of foreign matter & off-character tobacco?
 Yes ____ No ____ Some ____ Unknown ____
 - C. Did you make an effort to remove stalks, grass, weeds? Yes ____ No ____ Sometimes ____
 - D. Use a moisture meter or other device for moisture? Yes ____ No ____ Sometimes ____
7. How will/has baling affected the following (CHECK ONE PER LINE):

| | <i>Worse/ Major</i> | <i>Worse/ Minor</i> | <i>Same/ None</i> | <i>Better/ Minor</i> | <i>Better/ Major</i> | <i>Unknown</i> |
|---------------------------|-------------------------|-------------------------|-----------------------|--------------------------|--------------------------|----------------|
| Presentation/Integrity | _____ | _____ | _____ | _____ | _____ | _____ |
| Auction process | _____ | _____ | _____ | _____ | _____ | _____ |
| Weighing | _____ | _____ | _____ | _____ | _____ | _____ |
| Re-sales | _____ | _____ | _____ | _____ | _____ | _____ |
| Price (vs. Sheets) | _____ | _____ | _____ | _____ | _____ | _____ |
| Handling | _____ | _____ | _____ | _____ | _____ | _____ |
| Moisture/heating problems | _____ | _____ | _____ | _____ | _____ | _____ |
| Labor | _____ | _____ | _____ | _____ | _____ | _____ |
| Short-weights/lossage | _____ | _____ | _____ | _____ | _____ | _____ |
| Paper Work | _____ | _____ | _____ | _____ | _____ | _____ |
8. Do farmers present baled tobacco different because of their name on the tag? Yes ____ No ____
 If yes, how? _____
9. Comparing bales to sheets, do you feel that grading bales is: Better ____ Same ____ Worse ____
10. Number of 1999 warehouse accidents due to baling? None ____ Near ____ Minor ____ Major ____
11. 1999 bales rejected due to temperature/moisture? ____ Num; Is this problem Major ____ Minor ____ None ____
12. Comments: major strong points/problems relating to baling?

13. Comments: educational/research needs?

<please see reverse side for general questions>

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