**2008 BALE PACKAGING AND LINT CONTAMINATION SURVEYS**
**National Cotton Council of America**
**Cordova, TN**

## Introduction

In June through early August of 2008, the National Cotton Council (NCC) asked US and foreign mills to participate in an online survey, addressing bale packaging performance and lint contamination concerns. In addition to the NCC, two other organizations, the National Council of Textile Organizations (NCTO) and Cotton Council International (CCI), assisted with the preparation of the surveys and helped publicize the surveys. Both organizations targeted mill representatives who were willing to complete an online survey. NCTO assisted with the US mill survey and CCI assisted with the foreign mill survey. The cooperation of NCTO and CCI resulted in an excellent response to the surveys.

The surveys served a four-fold purpose. First, the surveys provided mills with an opportunity to convey their preferences for specific bale packaging materials, that is bagging and ties. Second, the surveys provided a vehicle for mills to provide feedback on lint contamination concerns. Third, survey questions provide a tool the NCC Joint Cotton Industry Bale Packaging Committee (JCIBPC) can use to gauge the attitudes of textile mills towards bale packaging preferences and performance. Fourth, the responses from the surveys will be used to strengthen the US cotton industry's lint contamination prevention program.

## Materials and Methods

Survey questions were based on interview questions previously used by NCC staff and trade teams in visits with domestic and foreign mills. An online survey tool called Survey Monkey™ was used to deliver the survey to the targeted mills. The introduction to both surveys included the following statement:

"…the NCC is actively pursuing the elimination of lint contamination from all sources and the preservation of bale cleanliness so that optimum bale conditions are preserved for textile customers of US cotton."

"To accomplish these goals, a better understanding of lint contamination bale issues and bale packaging material performance is needed. Because most US cotton lint is consumed outside the US, we are conducting a worldwide mill survey to provide us with reliable information concerning lint contamination. You are invited to participate. The survey uses a multiple choice design, limiting the need for precise answers. For each question, choose the answer or category MOST APPROPRIATE for your business. Please be sure to answer ALL questions. The survey consists of less than 20 questions and can be completed in about 10-15 minutes."

When mills were contacted about taking the survey, they were assured that their responses would remain confidential. Therefore, only aggregated responses to questions were included when the data from the surveys was compiled for presentation. It should be noted that in addition to

multiple choice responses, most questions provided mills with an option for an open-ended response. While some open-ended responses are referenced, those responses are reported in a manner that prevents disclosure of any mill's identity.

Questions on the surveys covered three areas. First, the mills were asked who they were and what they produced. Second, they were asked a series of questions about packaging material preferences. Third, mills were given the opportunity to respond to a series of questions concerning contamination and environmental issues.

A review of the surveys reveals that almost all (more than 95 percent) US mills participated in the survey. Almost 200 foreign mills took or attempted to take the survey, but the foreign mill summary report is based on answers from 160 foreign mills.

Because responses from the survey will be used to help shape US bale packaging policy and CCI will use the results to respond to questions concerning US cotton, when reporting the results NCC staff chose to include only responses from mills who actually consume some US cotton. The surveys were designed to make sure key questions on the US mill survey matched key questions on the foreign mill survey. Survey questions were modeled after questions NCC Technical Service's staff and industry trade teams use in face to face interviews with textile mill representatives.

Many foreign mills who took the survey, consume less than 50,000 bales (11,000 metric tons) per year. Other responses came from mills that use over 1,000,000 bales (225,000 metric tons) annually. Most of the responses came from mills between the high and low consumption numbers. It should be noted that the results reported in the two summaries are not weighted by cotton consumption or, in the case of foreign mills, how much US cotton a mill consumed. A cursory review of weighted responses by volume revealed that both large and small mills had similar likes and dislikes when it came to bale packaging materials. The same was true for the responses to the contamination questions. So it is accurate to say that small, medium and large mills face similar issues and voice similar concerns when it comes to bale packaging preferences and contamination concerns.

**Sourcing US Cotton**

The foreign mill survey included responses from mills operating on all major continents except Africa. Consumption of US cotton by foreign mills included responses from mills that used less than 10% US cotton to mills that use exclusively US cotton. Foreign mills were allowed to report use in metric tons or bales, while US mill consumption was only reported in bales. The US mill survey revealed that about one half of the US mills only use US cotton.

Both surveys showed that mills appear to have preferences for certain regional growths of cotton. However, nine foreign mills could not identify the source of their US cotton and marked the "unknown" box on the surveys (**Figure 1**). One of the larger foreign mills indicated that they spin only US cotton and buy all of that cotton from one geographic region. The referenced textile mill rated the region in the US where they source their cotton as a region that had no contamination. When foreign mills were asked to compare US cotton with other growths, most of those mills responded by rating the US as a source of cotton with significantly less

contamination than other growths.

Figure 1.

| 9. Source of Cotton by Growing Region in U.S.* | South-east | Mid-South | South-west | West |
|---|---|---|---|---|
| Less than 10% | 11 | 9 | 7 | 13 |
| 21 to 40% | 10 | 9 | 14 | 12 |
| 41 to 60% | 10 | 22 | 20 | 8 |
| 61 to 80% | 3 | 2 | 8 | 7 |
| 81 to 90% | 2 | 1 | 5 | 4 |
| More than 90% | 1 | 1 | 3 | 4 |
| 100% | 3 | 3 | 21 | 25 |

* Question # 9 on Foreign Mill Survey: as a percent of annual cotton purchases indicate the amount of cotton typically bought from each region

**Responses to Bale Packaging Preferences Questions**

The same range of responses was used for packaging (bag and tie) preferences questions and a "+2" to "-2" scale was used to evaluate responses. The types of packaging materials included in the survey are materials approved for use as packaging materials in the US The use of the same responses for all questions allowed mills to supply individual preference responses for each material. The following responses were allowed for each packaging characteristic: "Superior", "Above Average", "Average", "Below Average", and "Poor". When the responses to the questions were rated a "Superior" response was assigned "+2", an "Above Average" response was assigned a "+1", an "Average" response was assigned a "0", a "Below Average" response was assigned a "-1", and a "Poor" response was assigned a "-2".

**Bale Packaging**

Questions regarding bagging and ties provided mills with an opportunity to compare performance of and preferences for various packaging materials **(Figure 2)**. The bag and tie preferences figure summarizes responses from both surveys with negative numbers associated with lower preferences and positive numbers associated with higher preferences. For example Figure 2 indicates US mills expressed a strong preference for PET plastic strapping while both

surveys indicate that burlap is the least preferred bagging material.

Figure 2

| BAG & TIE PREFERERRENCES | | | |
|---|---|---|---|
| **Most Preferred (+2)** | | **US** | **Foreign** |
| **Least Preferred (-2)** | | **Question 11** | **Question 14** |
| **Ties** | **Steel Strap** | **-0.8** | **0** |
| | **Wire** | **-0.2** | **0.1** |
| | **Plastic (PET) Strap** | **1.6** | **0.5** |
| | | **Question 17** | **Question 20** |
| **Bagging** | **Burlap** | **-1.4** | **-1.3** |
| | **Cotton** | **0.1** | **1.1** |
| | **Polyethylene (PE) Film** | **1.1** | **0.5** |
| | **Woven Polypropylene (WPP)** | **0.3** | **-0.5** |

Question 11 on Domestic Mill Survey and 14 on Foreign Mill Survey:
Question 17 on Domestic Mill Survey and 20 on Foreign Mill Survey:
Overall, describe your preference level for each bale bag material.

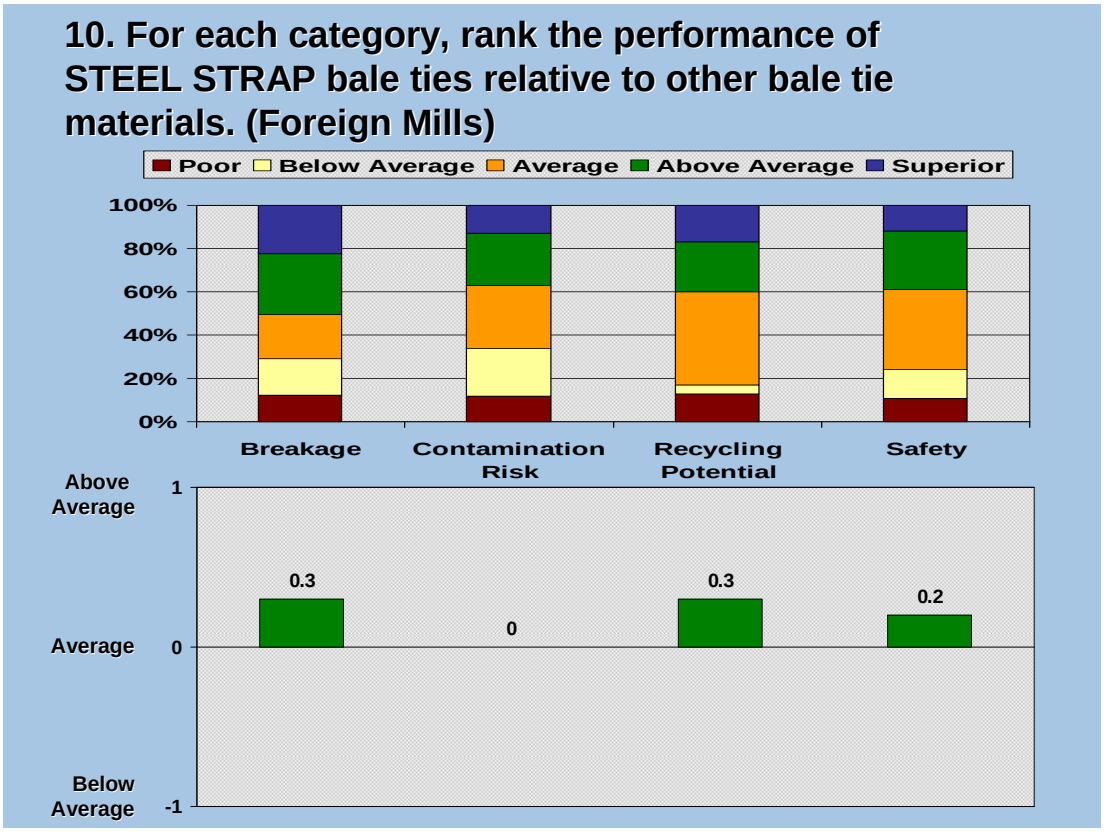
***Section 1 – Bale Ties***

Both surveys asked mills to evaluate three types of bales ties. Tie types were traditional steel straps (hoops) – a material still widely used by many foreign cotton gins, wire and PET plastic straps. US mills were asked to consider the following characteristics when rating each tie type: "breakage", "contamination risk", "recycling potential", "safety" and "cost". US mills indicated that tie cost was not an issue of concern. Based on the US mills' response to the cost question was dropped from the foreign mill survey. For each tie type, two styles of charts are used to summarize responses.

The steel strap slide **(Figure 3)** uses the two styles of charts to summarize the responses. The top chart, a frequency distribution chart, shows the range of responses to question 10 on the foreign mill survey. The use of percentages conceals individual mill responses and demonstrates the diversity of opinion existing among foreign mills when asked to rank the performance of steel strap.

The bar chart in the lower section of the figure shows the overall ranking of the same characteristics for steel strap by foreign mills. The summary presentations contain similar graphics for all packaging materials included in the surveys.

Figure 3




Question # 10 on Foreign Mill Survey (Question # 7 on US Mill Survey)

The final bale tie question asked mills to express a preference for one of the three types of bale ties. In these cases a minus two to plus two scale was used with minus two being least preferred and two being most preferred (See Figure 2). Mills had the option of submitting open-ended responses to the performance question for each type of tie. In most cases the open-ended responses underscored a mill's previous answers to the questions. In a few cases, mills expressed concerns over characteristics that were not surveyed.

***Section 2 – Bale Bagging***

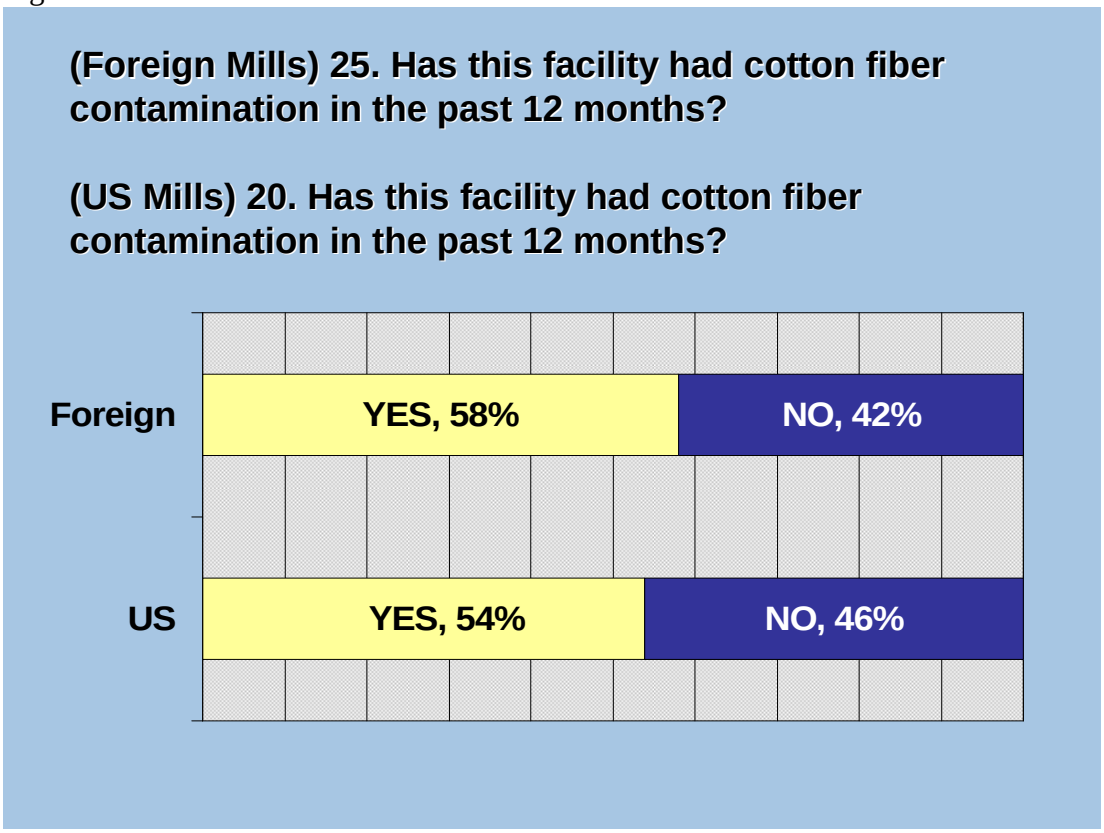
The same methodology was used for bale bagging questions. Mills were asked to evaluate four different types of bagging: burlap, cotton, polyethylene (PE) film and woven polypropylene (WPP). The US mill survey asked mills to rate the following characteristics: "durability", "contamination risk", "recycling potential", "cleanliness", "cost" and "moisture transfer". US mills indicated that bagging cost was not a concern so that characteristic and moisture transfer characteristic were not included on the foreign mill survey.

The bagging charts match the charts used to summarize the bale tie questions. Open-ended responses were allowed for all bagging questions but are not included in the summary. The final bale bagging questions gave mills an opportunity to communicate their bagging preferences (See Figure 2).

***Section 3 – Lint Contamination and Environmental Concerns***

Several questions in the bag and tie sections addressed packaging material disposal. The last portion of the surveys focused on lint contamination and related concerns. Mills were asked to share their lint contamination experiences **(Figure 4)**. The final figure is based on the following yes or no question: "Has this facility had cotton fiber contamination in the past 12 months?" If the mill answered "yes," a follow up question asked about the frequency of those occurrences. Once again open-ended questions allowed mills to elaborate on their contamination experiences. Additional questions presented mills with an opportunity to provide information concerning the colors and types of contaminants they find in cotton. Responses to these questions help pinpoint possible sources of contamination.

Figure 4




Question #25 on Foreign Mill Survey and Question #20 on US Mill Survey

Both groups of mills were asked to compare the amount of contamination in cotton growths from around the world with US cotton **(Figure 5)**. We were pleased to discover that 54% of the foreign mills answering this question believe that US cotton is significantly less contaminated than other growths and another 35% of those mills stated that US cotton is less contaminated than other growths. 46% of US mills indicated that they only spin US cotton so they were not able to make a comparison. Note that none of the mills answering the question believe that US cotton has significantly more contamination than other growths.

Figure 5

**26. / 30. In comparison with the amount of contamination in other cotton growths, U.S. cotton typically has...**

| | US Mills | US Mills (No N/A) | Foreign Mills |
|---|---|---|---|
| ...significantly less contamination. | 15% | 29% | 54% |
| ...less contamination. | 23% | 43% | 35% |
| …about the same. | 15% | 29% | 9% |
| ...more contamination. | 0% | 0% | 1% |
| ...significantly more contamination. | 0% | 0% | 0% |
| N/A (Mills only spin US cotton) | 46% | - | - |

Questions # 26 on US Mill Survey and # 30 on Foreign Mill Survey:

In comparison with the amount of contamination in other cotton growths, U.S. cotton typically has...

The concluding open-ended contamination question **(Figure 6)** asked the foreign mills to identify "…what country or countries produce cotton with the least contamination?" Forty-eight mills answered US cotton, seventeen answered Australian cotton and fifteen responded by ranking US cotton and Australian cotton as equally clean.

Figure 6


## Conclusion

The results from these surveys provide the US cotton industry with information about how our packaging materials are performing. This information may be used as a policy development tool. Survey results provide the NCC JCIBPC with additional information when performance of packaging materials is reviewed. The surveys will also be used to protect and build on the US raw cotton industry's image as a source of contamination free cotton.

The US understands its reputation as a source of contamination free cotton is on the line each and every day bales of US cotton are spun into yarn any where in the world. With that fact in mind, the results from surveys like these arm ginners, growers and others with the best information available so that they can search out and eliminate potential sources of contamination as cotton is harvested, ginned and moves through the supply chain. Preventing lint contamination and improving the performance of bale packaging materials is a goal the US cotton industry whole-heartedly embraces.

## Acknowledgements

CCI staff is commended for what was an exceptional response from foreign mills to the international survey. CCI representatives from around the globe made sure mills knew about the survey and had an opportunity to complete it. In the case of the Chinese survey, CCI went above and beyond by personally interviewing many mill representatives then completing the online survey for them. In addition, the CCI team in Turkey translated the survey for those mills so that the Turkish mills could go online and complete the survey in their native language. NCTO should also be commended because their efforts resulted in almost all US mills completing the US survey.