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SURVEY OF MODULE COVER MATERIALS AND MODULE BUILDING PRACTICES

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Abstract

Seed cotton modules play an important role in the harvest, storage, and ginning process. Poor harvest and post harvest conditions in recent years resulted in significant losses of both quality and yield in some areas when cotton was stored in modules. Gins across the Cotton Belt were surveyed in 2001 to determine how modules and module covers are being used.

Introduction

Harvesting seed-cotton and storing it in modules prior to ginning is the dominant practice in the United States cotton industry today. The module builder's introduction in 1972 made possible many cotton industry's innovations in harvesting and ginning. During that period harvesting equipment along with gin machinery evolved into more efficient machines that are higher in capacity and speed, but the module builder has remained relatively unchanged. The early years saw harvesters with baskets capable of holding up to two thousand pounds of seed-cotton when filled to capacity. This meant that ten or more dumps were often needed to build a module of seed-cotton. Contrast that with today's high capacity harvesting machines. When filled to capacity, modern cotton picker baskets can hold and unload in excess 10,000 pounds of seed-cotton per dump. At that rate, only two full dumps of cotton are required per module.

2001 saw many seed-cotton modules damaged by excessive moisture prior to ginning. Gins reported both quantity and quality losses to lint and cottonseed stored in modules. Many gins also reported significant increases in processing costs when water damaged modules were ginned. Both the Texas Gulf Coast and Mid-south states experienced major rain events during the 2001 cotton harvest. Rainfalls exceeding 15-inches in 1 to 2-day periods were recorded in both areas. Making matters worse for moduled cotton, these rains were often accompanied by high winds.

Many gins expressed dissatisfaction with the module covers they used as well as the way harvest crews constructed modules. In some cases ginners reported new, unused module covers did not perform as expected. In August of 2001, a ginner showed me a number of module covers that were purchased new prior to the start of the 2001 season. Identification labels on the covers stated that the module covers were indeed manufactured in 2001. The ginner noted that these module covers had only been used once on a single customer's modules and had only been on the modules for a short time before heavy rains fell in his area. It appeared that the UV coating and base fabric had deteriorated during the period of time the covers were on the modules in the grower's field. As a result, the covers' coatings washed off the covers during the heavy rains. These module covers developed many small pinhole leaks during the rains and the ginner stated that the seed-cotton was damaged making it very difficult to gin.

At the 2002 National Cotton Council's Annual Meeting the following resolution was adopted and is a part of Council policy:

"Urge National Cotton Council, Cotton Incorporated, and state and regional producer/ginner organizations to update and reinforce educational programs relating to seed cotton module building, covering and cover selection, while working with the manufacturers of module coverings to establish guidelines for standards of performance commensurate with the needs of producers and ginners;"

To develop a basis for a sound cotton industry educational program, it in important to understand how growers use module builders and module covers. Gins and growers across the cottonbelt were surveyed to determine module building and covering practices. National Cotton Council staff developed the survey form.

Survey

Distribution

Initial distribution took place at the Texas Cotton Ginners' Association trade show in Lubbock, Texas in the spring of 2002. National Cotton Council Member Service Representatives also distributed surveys to gins across the cottonbelt. The Internet was used to reach National Cotton Council producer and ginner delegates with E-mail addresses. Survey forms were filled out and returned by growers as well as ginners. The following remarks refer to gins since growers who returned the survey indicated they relied on information supplied by their gin when filling out the survey.

Results

Twenty-five gins were represented by returned surveys. Those gins accounted for close to one million bales of cotton or about six percent of the bales ginned in the United States in 2001. Sixty plus percent of those returning surveys represented gins in high rainfall areas including the Texas Gulf Coast, the Mid-south Delta and the Southeast. The remaining surveys were from gins in the Texas Plains and the Western growing region.

Module Practices

Survey results indicated ninety-seven percent of the cotton was stored in modules prior to ginning. Approximately one-half of the gins reported that all of their seed-cotton was moduled. However, not all areas reported the same levels of module use. A relatively low volume gin in the survey, a 15,000 plus bale gin in the Southeast, reported eighty percent of their growers' cotton was moduled. Only four gins reported that less than ninety-five percent of their growers' cotton was moduled. Modules ranged in size from a minimum of eight and one-half bales per module for stripper harvested cotton in West Texas to a high of sixteen bales per module for picked cotton. The average module size reported was thirteen bales. No gins in areas where pickers dominated the harvest reported average modules containing less than fourteen bales.

Gins were questioned about the distance they traveled to pick up modules. Seven gins reported traveling in excess of one hundred miles in one direction to pick up modules. On the average gins reported trucks hauled modules under twenty miles to their gin storage yard prior to ginning. All gins reported using module yards as the primary storage area. In fact, six gins indicated all of their customers' cotton was stored in module yards close to the gins. Roads were used as storage areas by twenty-one percent of the gins and nearly sixty percent of the gins stored some cotton in theirs growers' fields for a period of time prior to ginning. The gins were also asked what type of surface is used for module storage. Sixty-three percent indicated their storage yards are compacted or paved and five gins indicated these types of hard surfaces are utilized exclusively for module storage. Thirty-eight percent of the gins utilized grass or pasture storage areas and fifty-eight percent of the gins utilized soil for at least part of their storage areas. Note that the data indicated several gins relied on a combination of surface types in order to find adequate storage during the peak of harvest. Only one gin said their module storage area was not sloped to facilitate drainage. Two thirds or sixteen gins indicated all of their module yards are sloped.

Gins also reported the number of days it took to get modules ginned. Four gins reported that modules were stored for at least three months or longer prior to processing. On average the length of storage for all gins was sixteen days from harvest to ginning. Gins were asked if module temperatures were monitored. Forty-two percent or ten gins that answered this question said yes. Four gins noted they monitor modules once a week and the rest of the gins who take the time to monitor temperature in modules indicated their modules are monitored more often. Some respondents noted that temperature probing takes place for only the first few days after harvest. These ginners indicated they were looking for modules that may have been harvested "green" or harvested after heavy dues or rains. Gins were also asked if they attempted to monitor moisture levels in modules and only thirteen percent of the gins answered yes. The three gins that indicated they monitored moisture indicated they also monitored module temperatures. Another gin indicated their module yard is inspected twice each day searching for fires in modules, "hot modules" that are heating up due to excess moisture, and as an inventory control measure.

Extent of Damage

Questions were asked to determine if moduled seed-cotton had sustained damage prior to ginning. Gins were also asked if module covers were damaged by wind or rain. One Texas gin in the low rainfall area reported one hundred and fifty module covers out of twelve hundred were damage by wind in 2001. However none of the gins in that region reported any other type of damage. All other areas reported varying levels of seed-cotton damage. Nearly half the gins surveyed reported that they had seed-cotton modules damaged by rain in 2001. Damage due to rain ranged from eight to five hundred modules per gin. Fully half the gins reported that wind had damaged module covers and left modules vulnerable to rain. Both rising water (twenty-one percent) and seeping water (thirty-eight percent) caused damage to seed cotton. Half the gins with damaged seed-cotton modules reported that these modules required extra drying and slow ginning.

Module Cover Information and Performance

For surveyed gins in 2001 woven polyolefin materials covers dominated the market. This type of woven cover accounted for ninety-two percent of all module covers utilized by surveyed gins. The remaining covers were either Polyethylene film covers used at one gin or vinyl covers used by two gins.

Eighty-two percent of respondents indicated that manufacturers were identified on labels or on the covers themselves. Fifty-five percent indicated that manufacturers' addresses and telephone numbers were displayed on identification labels or covers. Less than half of the gins indicated that their module covers carried information telling what year they were manufactured. Only a quarter of the gins said their module cover stated what types of fabric constructions were used in the covers. Conversely, nearly half the gins indicated that no information about fabric construction was provided. Only fourteen percent of the survey respondents indicated they received information from manufacturers describing coatings and life expectancy.

Fifty-nine percent of the respondents answered that their module covers did not contain information describing coating and life expectancy. One ginner responded that as far as he is concerned, the number one issue with module covers is the break-down of coatings and covers due to exposure to the sun. In other words, module covers need better UV inhibitors to protect the covers from the harsh rays of the sun. Cover size, including top and side finished dimensions, was known according to twenty three percent of the gins responding to the survey. Forty-one percent of the respondents indicated information about cover size was not provided.

Securing Module Cover

Twenty-nine percent of the gins indicated module covers were secured by ropes or chords run under or through the modules. Eight percent of the gins indicated module pins were used but forty-two percent of the gins answered no, they do not use module pins. Most ginners I have talked to discourage their growers from using module pins. This is because pins often get left in modules resulting in down time during ginning or even damage to gin machinery. Eighty-eight percent of the gins indicated that they use straps or bands around the sides and ends of modules to secure module covers.

Module Cover Ownership and Usage

While ninety-six percent of the gins responding to the survey stated that the gins owned the covers, it would be incorrect to assume there are not areas in the cottonbelt where growers do own their own module covers. For example in Oklahoma, the state's Corporation Commission forbids gins from furnishing module covers to growers for competitive reasons. Gins and growers reported owning some 35,800-module module covers of which forty-five percent were reported to be new module covers at the start of the 2001-ginning season. Gins expected growers to cover their own modules in their fields prior to transport to the gins. However, most gins indicated that once the modules were in gin storage yards, gins are responsible for seeing that modules remain covered.

All gins reported module covers were used more than once per season with seven of the gins stating that all of their covers are used more than once. On average, gins reused covers three and one-half times during the 2001 harvest and ginning season. Two gins reported they often reuse covers seven to ten times during a ginning season.

Gins were also asked about post ginning season cover care. Over three quarters of the gins answered that they have a self inspection program for their module covers and half the gins indicated that they also rely on a third party to inspect their module covers. In other words, some gins are inspecting and culling their module covers before sending their module covers to a third party for inspection and repair.

Nineteen gins answered the question that asked how often they replaced module covers. Forty-two percent said yes they do replace worn covers on a regular basis, but thirty-eight percent said no, they do not have a replacement program in place. Gins across the cottonbelt responded that on the average, they replaced module covers about every five years. The nine gins in higher rainfall areas that answered this question, indicated covers were replaced more frequently, about four and one-half years on the average. Please note that one gin in a high rainfall area indicated that normally covers are replaced after 8 years of service. However when I looked at the number of new covers versus used covers for that gin in 2001, the data indicated that twenty percent of the gin's covers were new that year.

Gins in low rainfall areas expect more years of service from module covers. Responses from these areas indicated an anticipated cover life of five to six years was typical. One gin indicated that they expected module covers to last up to ten years. My own observations lead me to believe that many gins are using covers that no longer serviceable, and because of the poor condition of the module covers their customers' seed-cotton is vulnerable to damage or contamination.

Summary

It is important to understand how modules and module cover us at the beginning of the twenty-first century. Since its introduction moduling seed-cotton resulted in substantial cost savings and more efficient utilization of existing harvesting and ginning equipment. One of the variables the grower or ginner can not control is the weather at harvest. The combination of poor cover performance, poor module construction, building modules in poorly drained or hard to access areas resulted in reports of seed cotton damage in 2001. With this information in hand, the industry can embark on an education effort that will help growers store their seed cotton in modules and protect them from the weather. At the same time, his ginner will have confidence that when the modules are stored and ginned, both quality and yield have been preserved.

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Note: all tables are compiled from information gins provided from the 2002 Survey of "Module Cover Materials and Module Building Practices". Since all gins returning surveys did not answer all survey questions, percentages may add up to less than 100.

Table 1. Module Cover Materials and Labels.

		(percent) of Gins Answering the Question	
	Number	**Yes**	**No**
Woven Poly	24,100	92	8
Nonwoven Poly (PE Film)	2,500	4	54
Vinyl	2,550	8	50
Name of Manufacturer		75	8
Manufacturer's Name And Telephone		50	17
Date Manufactured		42	29
Fabric Construction		21	50
Coating And Life Expectancy		13	58
Cover Dimensions		21	42

Table 2. Cover Use and Maintenance Questions.

		(percent) of Gins Answering the Question	
(SECURED) Tied Under/Through Module		29	29
(SECURED) Tied to Module Pins		8	42
(SECURED) Use Straps or Belly Bands		88	4
In 2001, How Many Covers were	Number		
- New (Total)	16,095		
- Used (Total)	19,710		
Cover Use During Season (Number of Times)	Average	Maximum	Minimum
	3.5	10	1
Responsible Party for Covering Modules		(% Yes)	(% No)
- Gin/		33	42
- Grower/		79	4
Are Covers Inspected By the Gin?		75	13
Are Covers Inspected By a Third Party?		50	38
Are Covers Replaced on a Regular Schedule?		42	38
Average Anticipated Cover Life (Seasons/Years):	Average	Maximum	Minimum
	4.8	10	3

Table 3. Cultural Practices – How Much of your Gin's Cotton Is (Percentage):

Moduled?	97
Custom Harvested?	19
Picked?	78
Stripped?	19

Table 4. Module Storage Problems* - Last season (2001) did you have seed cotton stored in Modules or did you have Module Covers that were Damaged by -

	Total Number	(Yes %)	(No %)
Rain?	1,109	46	46
Wind?	865	50	46
Rising Water?	758	21	67
Seeping Water?	890	38	46
Is Module Temperature Monitored?		42	33
If So, How Often?	Average	High	
(Days)	5.4	7	
Is Module Moisture Monitored?		13%	54%
If So, How Often?	Average	High	
(Days)	3.8	5	
For Damaged Modules, did seed cotton			
Require Extra Drying?	1,736	54	4
Slower Processing?	1,702	50	13
Remains Unginned?	277	17	29

* Some gins distinguished between wind and water damage while others did not. As a result, some modules were counted twice.

Table 5. Principal Module Storage Areas - Defined as areas where modules were stored 3 or more days prior to ginning.

TYPE	Total Number	(Yes %)	(No %)
In Yards on Pads (Capacity in Modules)	60,980	96	
On Roads (same as above)	7,346	21	29
In Growers' Fields (same as above)	17,270	58	4
SURFACE			
Compacted/Paved		63	21
Grass or Pastures		38	21
Soil		58	8
DRAINAGE			
None		17	21
Sloped (Pads)		83	4

Table 6. Transportation and Storage Questions.

	High	Low	Average
Long Haul (Miles)	135	15	65
Versus Average Haul (Miles)	45	6	19
Total Modules Hauled (all gins - 68,030)	9,545	285	3,240
Average Module Size in Bales	16	8.5	13
Days from Harvest to Ginning: Average	70	3	15.9
Days from Harvest to Ginning: Long	100	7	36.9
Number of gins who	>90 days	60 - 89 days	30 - 59 days	<30 days
reported storing modules	4	1	5	14
Gin Volumes (in thousands)	>100	50 -100	25-50	<25
	2	3	11	8