



EFFECTS OF NON-LINT REMOVAL ON SPINNING PERFORMANCE AND THE QUALITY OF COTTON YARNS: Part 4

In the three previous issues of *Textile Topics* we have presented parts of a report on a study conducted at the International Center that evaluated cottons ginned with zero, one and two lint cleaners. We will use this issue to conclude the report. We suggest interested readers refer to the previous three issues of *Topics* in order to have the full report.

In the March 1991 issue we carried Tables I, II and III, giving the fiber properties of the cottons included in this study, the opening and carding waste percentages, and fiber length distribution data. Also, a processing flow diagram was presented. The April issue gave rotor spinning trial results for the single- and tandem-carded lots, and ring spinning data were presented in the May issue.

The remaining data are given in Tables VIII and IX below. These show yarn breakage analyses made at rotor spinning on the single- and tandem-carded lots. (This type of analysis was not made at ring spinning, although a record of breaks was made and reported in Tables VI and VII in the May *Topics*.)

The data given in Tables VIII and IX suggest that the best spinning came from cotton that had passed through two lint cleaners, regardless of the carding treatment. The second lint cleaner reduced trash-related breaks to one-half the rate of the cottons coming from zero and one lint cleaner. The single-carded cotton ran in a less stable manner than that processed through the tandem card. Tandem carding reduced the number of trash-related breaks (continued on next page)

TABLE VIII
ROTOR SPINNING BREAKAGE ANALYSIS
(Yarns Spun from Single-carded Sliver)

Sample Reference	A	B	C
Number of Rotors	24	24	24
Doff Time	8.33	8.33	8.33
Total Rotor Hours	200	200	200
Package Length (km)	39.35	39.35	39.35
Total Weight Spun (lbs)	34.15	34.15	34.15
Sliver Causes	0	0	0
Spinning Causes			
Bark	2	0	0
Seed Coat Fragment	8	9	5
Trash	2	1	0
Total Trash-related	12	10	5
Nep	1	4	2
Slub	28	24	26
Slub with yarn in rotor	0	0	0
Trashy slub	1	2	1
Total Entanglement-related	30	30	29
Unknown	1	0	0
Yarn in rotor	0	0	0
Total Unknown	1	0	0
Total Spinning Causes	43	40	34
Uninspected Breaks	1	0	0
Non-spinning Causes			
Total Non-spinning Causes	0	0	0
Proportion Trash-related	27.9 %	25.0 %	14.7 %
Proportion Entanglement-related	69.8 %	75.0 %	85.3 %
Proportion Unknown	2.3 %	0.0 %	0.0 %
TOTAL SPINNING AND UNINSPECTED per 1000 rotor hours	44	40	34
per 1000 rotor hours	220	200	170
per 1000 pounds	1288	1171	996
TOTAL INTERRUPTIONS (all counts) per 1000 rotor hours	44	40	34
per 1000 rotor hours	220	200	170

TABLE IX
ROTOR SPINNING BREAKAGE ANALYSIS
(Yarns Spun from Tandem-carded Sliver)

Sample Reference	A	B	C
Number of Rotors	24	24	24
Doff Time	8.33	8.33	8.33
Total Rotor Hours	200	200	200
Package Length (km)	39.35	39.35	39.35
Total Weight Spun (lbs)	34.15	34.15	34.15
Sliver Causes	0	0	0
Spinning Causes			
Bark	0	0	0
Seed Coat Fragment	0	0	0
Trash	0	1	0
Total Trash-related	0	1	0
Nep	2	0	1
Slub	13	21	12
Slub with yarn in rotor	0	0	0
Trashy slub	1	0	1
Total Entanglement-related	16	21	14
Unknown	2	2	0
Yarn in rotor	0	0	0
Total Unknown	2	2	0
Total Spinning Causes	18	24	14
Uninspected Breaks	0	0	1
Non-spinning Causes			
Total Non-spinning Causes	0	0	0
Proportion Trash-related	0.0 %	4.2 %	0.0 %
Proportion Entanglement-related	88.9 %	85.5 %	100.0 %
Proportion Unknown	11.1 %	8.3 %	0.0 %
TOTAL SPINNING AND UNINSPECTED per 1000 rotor hours	18	24	15
per 1000 rotor hours	90	120	75
per 1000 pounds	527	703	439
TOTAL INTERRUPTIONS (all counts) per 1000 rotor hours	18	24	15
per 1000 rotor hours	90	120	75

(almost totally caused by seed coat fragments) to zero. Additionally, tandem carding reduced the number of entanglement-related breaks by about half. Because of the effectiveness of tandem carding in removing trash, the influence of lint cleaning treatments on spinning performance was less pronounced.

Conclusions made from this study are:

1. The influence of lint cleanings was to reduce the quantity of trash within the cotton and consequently the quantity of waste removed at opening and carding.
2. Lint cleaning treatments had little influence on the quality of rotor and ring yarns produced in this study.
3. Tandem carding caused a little fiber damage which was visible at reduced ring yarn strength, although the number of yarn imperfections was reduced.
4. Rotor yarns produced from the tandem-carded cotton did not show a deterioration in yarn strength with prolonged spinning, and trash-related breaks were significantly reduced in number to almost zero.
5. The improvement in yarn imperfections obtained by tandem carding was inferior to that achieved by combing.
6. There were no apparent benefits to tandem carding cotton that was destined for combing.

This concludes our report on the effects of non-lint removal on spinning performance and the quality of cotton yarns. We would like to mention again that the report was prepared by John B. Price, Assistant Director of the International Center. This research was sponsored by the Texas Food and Fibers Commission. We believe the study and the report can be of considerable value to several segments of the cotton industry, and we are pleased with the opportunity to present this information.

DID YOU KNOW . . . (or even care)

- ☞ Scotch whiskey contains as many as 500 different compounds.
- ☞ The spotted hyena is born with a full set of operational teeth.

The above gems of wisdom have been lifted from the pages of different issues of *Chemical & Engineering News*. If any of our readers would care to contribute obscure information for an occasional column, we will be happy to print it.

AGRICULTURAL COMMISSIONER VISITS ICTRD

We were pleased to have Rick Perry, Texas Commissioner of Agriculture, visit the International Center on June 5. Research conducted here is closely related to the production of natural fibers, and it seems appropriate for the Commissioner to see first hand the studies involving cotton, wool and mohair.

The Commissioner's visit began with a meeting in the ICTRD auditorium attended by 65 agri-business individuals from West Texas. After a welcome by Dr. Robert Sweazy, Vice Provost for Research at Texas Tech University, statements concerning the utilization of agricultural commodities were made by Gary Cobb, Vice President for Marketing at Plains Coop Oil Mill in Lubbock, and Autry Moore, Vice President/General Manager of the Textile Division of Plains Cotton Cooperative Association. Commissioner Perry then spoke to the group about Texas agricultural products and the need for additional processing of these within the state. He pointed out that most of the natural fibers produced here are exported to other states and other countries, and he emphasized the need for additional industry in Texas in order to consume more of these fibers at home.

Following the Commissioner's speech, he made a tour of the facilities at the International Center, accompanied by a group of those attending the meeting. Assisting with the entire meeting was Deputy Assistant Commissioner Lindsey Dingmore, Jr.

The Commissioner has been a lifelong farmer and rancher near Haskell, Texas, and has been personally involved in the production of cotton and wheat and in cattle raising. After being elected in November 1990, he quickly became a national representative of agriculture. He was elected to the Executive Board of the Southern United States Trade Association and was appointed by President Bush to the U.S. Trade Representatives Intergovernmental Policy Advisory Committee.

We were pleased to have Commissioner Perry and members of his staff visit the Center. We look forward to another occasion when more details of the research conducted here can be discussed.

NATURALLY COLORED COTTON

It is natural to become so adjusted to a standard that we sometimes feel negative about an abrupt change from that standard. Our first reaction to naturally colored cotton was anything but positive, and mostly the response was "What is that?"

For at least forty years we have trained ourselves to judge cotton on its whiteness along with other characteristics, and the whiter the better and the higher the price. It seemed natural to assign brown or green cotton to a very low status, something that would be classed "below grade" or even worse. Although the traditional classing system has designations for spotted, tinged and gray cottons, there is no place for true natural colors. As cottons get farther away from white, grades and values go down.

So much for tradition.

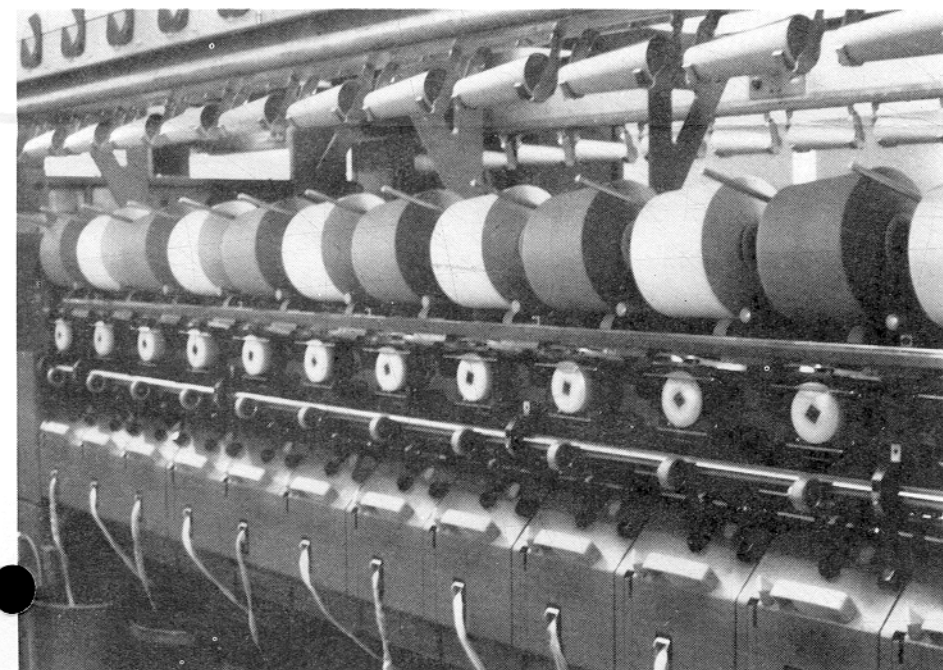
Sally Fox of Wasco, California has developed and is expanding the production of brown and green naturally grown cottons. She approached the International Center in 1988 for assistance in evaluating the quality of these cottons and determining their ability to be spun and used in fabrics. Research here has been progressing continuously since its initiation and has revealed some interesting results.

The processing from the bale of fiber to yarn has been mostly standard without any notable exceptions, and fabrics have been produced in several designs. We have learned recently that a large garment manufacturer is producing a line of jeans utiliz-

ing some of Ms. Fox's colored cotton. Additionally, we understand several textile companies in Europe and Asia have approached her about purchasing the cotton. Considering this, it would appear that what some have deemed an inferior fiber has now turned into something that may have substantial value.

Although Ms. Fox is from California and initially began the production of her fiber there, that state's regulations permit the production of Pima and Acala cottons only. Therefore, Sally has changed the growth area to Arizona and Texas and reportedly has 1,000 acres in production in these locations this year. It is understood that Ms. Fox contracts with cotton growers to produce the brown and green colors and that she sets a price with the farmers before planting. The exact amount seems to be a matter between her and the grower, and so far no one has divulged the price he receives. One news article reported the price to be about twice what a farmer gets for growing Acala. If that is true, then the incentive must be of such proportion that a number of producers will want to become involved.

So, what first seemed to have been a novelty or hobby now appears to have the potential of being a bonanza for Sally Fox and the farmers who produce her cotton. Time will tell whether this is a novelty or a fiber with a place in industry, but at least for the moment it looks interesting and does seem to have the right stuff for certain end products.



In order to give some description of the naturally brown cotton, we decided to rotor spin it with alternate positions of white fiber for the photo at left. While the black and white picture does not present true color, it does give an interesting contrast. Both cottons were spun with equal efficiency.

VISITORS

Visitors to ICTRD during June included Roger Bolick, Allied Fibers, Hopewell, VA; Seburn Crocker and Greg Dewitt, Henkel Corporation, Charlotte, NC; Wesley Masters, Amarillo, TX; Jerry Hinnenkamp, Brownfield Industrial Development Corporation, Brownfield, TX; and Jim Butler, Office of the Governor, Austin, TX.

A group from Queensland, Australia included Franklyn Brazil, Anchorfield, Brookstead; Harley Bligh, Conda Mine Plains, Brookstead; and Albert Enzerink and Peter Van Bevezekom, Balmoral Grain & Cotton Company, Pittsworth.

Also, fifty participants in a senior citizens' tour conducted by Perkiomen Tours of Pennsburg, PA visited the Center in June. Many of the group were retired from the textile industry and we enjoyed having them relate their "pre-retirement" experiences.