



EVALUATION OF NEWLY DEVELOPED TEXAS COTTON

A continuing goal of those involved in fiber and textile research in Texas is to produce even better fiber than that presently produced here. While the International Center for Textile Research is constantly evaluating the wool, mohair and cotton grown in our state, Texas A&M University has an ongoing program to develop new and better fibers for the textile industry.

During the past year we received a limited amount of cotton from Drs. K. M. El-Zik and P. Thaxton of the Department of Soil & Crop Sciences, Texas A&M University, College Station, Texas. This cotton was identified as Tamcot HQ95. Our evaluation revealed that it is an upland variety quite similar to Acala 1517. Fiber and spinning tests indicated it has considerable potential for both ring and rotor yarns.

After fiber testing (see table below), the cotton

TABLE I
FIBER PROPERTIES

<u>Individual Instruments</u>	
Tenacity (g/tex)	27.15
Elongation (%)	5.33
2.5% Span Length (in)	1.110
Uniformity Ratio (%)	43.7
Micronaire Value	3.90
Non-Lint Content (%)	2.16
Pressley Strength (Mpsi)	94.6
<u>IIC/Shirley FMT</u>	
Micronaire Value	3.99
Maturity (%)	80.0
Fineness (mtex)	164
Standard Fineness (mtex)	180
<u>MCI 3000 High Volume Instrument Data</u>	
Strength (g/tex)	28
Elongation (%)	6.4
Length (in)	1.13
Length Uniformity (%)	83
Micronaire	4.0
Leaf	4
Reflectance, R _d	72
Yellowness, +b	9

was opened and cleaned prior to carding on a standard single cotton card at 40 lbs/hr into 50 gr/yd sliver. Approximately half the fiber was drawn one time and then taken to a lap winder in preparation for combing. After combing, part of the sliver went through two processes of drawing and was reduced to 55 gr/yd for the production of a 1.8 hank roving. The remaining portion was drawn twice and reduced to 40 gr/yd in preparation for rotor spinning.

The cotton that was not combed was drawn twice after carding into a 55 gr/yd sliver. Part of this was converted into 1.8 hank roving prior to ring spinning, and the rest was supplied directly to rotor spinning.

As can be seen from Tables II and III on the following pages, our plan was to produce Ne 50/1 at ring spinning and Ne 40/1 at rotor spinning. The tables give details of the spinning equipment used and yarn testing results.

We believe the results are what one might expect, with both the carded and combed ring yarns having a greater strength than their rotor-spun counterparts. Although the ring yarns were finer, 50/1 vs. 40/1, the yarn/fiber tenacity ratios show that a higher percentage of the fiber strength resulted in yarn strength than was found in the rotor-spun yarns. This seems to be an accepted characteristic of the two yarns. However, it can be pointed out that while the rotor yarns were weaker than those spun on a ring machine, they still had good strength and generally acceptable properties.

It has long been understood that combing to remove a certain percentage of short fiber will give added strength to ring-spun yarns. However, very little research has been done on combing for rotor yarns. It will be noticed that the yarn/fiber tenacity ratio for the ring-spun yarns increased 12% when combing the fiber prior to spinning. At rotor spinning, the increase was only 8%.

The other yarn properties show the differences between carding and combing, as well as those between ring and rotor spinning. It is interesting to observe the Uster Evenness test results for all yarns. It will be seen that while neps were reduced consid-

erably by combing, hairiness of the yarns was increased by the same process. The general evenness of the yarns, however, was improved by the combing action, and this was much more noticeable for the ring yarns than for those produced at rotor spinning.

The International Center plans to begin an extensive research program to determine the value of combing for rotor yarns. We realize combed rotor yarns are being produced on a limited basis in the United States, but it seems to us that more of this is being done in Europe than in other locations. We are aware of one company in Switzerland that is doing an excellent job in producing a large quantity of combed rotor yarns. We are convinced this procedure will eventually be accepted and widely used.

The research reported in this issue of *Textile Topics* was sponsored by the Texas Food and Fibers Commission. We are grateful to that organization for sponsoring our work and for permitting us to report it.

JOHNSON & JOHNSON SPECIAL PROGRAM

For the eleventh consecutive year, the International Center conducted a one-week special training program for a group of managers and technicians from the Johnson & Johnson Company of Sherman, Texas. This was held during the week of July 9 through 13. Emphasis in this program was placed on cotton and other cellulosic fibers that are processed into spun yarns and nonwoven fabrics.

International Center staff members who served as instructors were Harvin R. Smith, Bobby G. Wyatt, Edwin R. Foster, John B. Price, Richard N. Combs and William D. Cole. Assisting were Pauline Williams, Linda Melton, Nell Powell and Denise May. Preparations for the program were organized by Harriet Boone.

Participating from Johnson & Johnson were Wanda Banks, Chris Beben, J.C. Doty, Linda Holmes, Ted Nguyen, Bill Reymond and Gerry Sherman.

We have mentioned in several previous issues of *Topics* that we offer these programs only when they are requested. We do not have a fixed schedule for conferences and seminars as some institutions do, for we have found it more effective to conduct these only when they are specifically requested. The cost of these depends on the length of the program, the number of instructors required, and the number of participants. We invite any organization that may be

TABLE II
RING SPINNING TRIAL RESULTS

SPINNING DATA			
Machine	Saco Lowell SF-3H		
Roving	1.8 hank		
Nominal Yarn No. (Ne)	50/1		
Ring Diameter (in)	2.0		
Spindle Speed (rpm)	11,000		
Traveller	10/0		
Draft (Break)	1.77		
Draft (Total)	28.0		
Twist Multiplier (α_e)	3.8		
Yarn Speed (yd/min)	11.4		
Ambient Conditions	72°F/55% RH		
YARN PROPERTIES		Carded	Combed
Skein Test:			
Yarn Number (Ne)	50.56	50.45	
CV% of Count	1.6	2.4	
Count-Strength-Product	2245	2518	
CV% of CSP	3.9	4.5	
Single Yarn Tensile Test:			
Tenacity (g/tex)	15.47	17.43	
Yarn/Fiber Tenacity Ratio*	0.57	0.64	
Mean Strength (g)	181	204	
CV% of Strength	15.2	10.4	
Elongation (%)	4.62	4.90	
CV% of Elongation	11.6	7.9	
Spec. Work Rupture (g/tex)	0.353	0.421	
CV% of Work of Rupture	24.9	16.8	
Initial Modulus (g/tex)	347	379	
Uster Evenness Test:			
Non-Uniformity (CV%)	24.62	19.93	
Thin Places/1,000 yds	1050	344	
Thick Places/1,000 yds	1800	764	
Neps/1,000 yds	839	428	
Hairs/100 yds	1207	1365	
ASTM Yarn Grade	D	C	

*Stelometer

interested in such a program to contact us at the address given on the back page of *Textile Topics*. We will be pleased to work with you.

TABLE III
 ROTOR SPINNING TRIAL RESULTS

<u>SPINNING DATA</u>		Schlafhorst Autocoro			
Machine					
Sliver	40 gr/yd				
Nominal Yarn No. (N_e)	40/1				
Rotor Type	T33				
Rotor Speed (rpm)	90,000				
Opening Roller Type	OB20				
Opening Roller Speed (rpm)	7,000				
Draft	194.4				
Twist Multiplier (α_e)	5.20				
Yarn Speed (yd/min)	76.0				
Navel	KN4 + 1.5/TT				
Ambient Conditions	72°F/55% RH				
Test Duration (24 rotors)	200			176	
<u>YARN PROPERTIES</u>	Carded Sliver		Combed Sliver		
	Initial	Final	Initial	Final	
Skein Test:					
Yarn Number (N_e)	40.00	39.80	40.18	40.16	
CV% of Count	1.1	1.2	1.7	2.3	
Count-Strength-Product	1956	1883	2069	2007	
CV% of CSP	3.9	2.4	3.6	7.7	
Single Yarn Tensile Test:					
Tenacity (g/tex)	13.69	13.06	14.65	14.17	
Yarn/Fiber Tenacity Ratio*	0.50	0.48	0.54	0.52	
Mean Strength (g)	202	194	215	209	
CV% of Strength	9.0	8.7	9.9	9.6	
Elongation (%)	5.49	5.30	5.56	5.33	
CV% of Elongation	8.5	7.8	8.8	7.9	
Spec. Work Rupture (g/tex)	0.377	0.357	0.407	0.384	
CV% of Work of Rupture	15.3	14.6	16.2	15.3	
Initial Modulus (g/tex)	249	244	249	260	
Uster Evenness Test:					
Non-Uniformity (CV%)	17.19	17.25	17.02	17.12	
Thin Places/1,000 yds	152	152	152	156	
Thick Places/1,000 yds	268	260	262	245	
Neps/1,000 yds	736	620	550	444	
Hairs/100 yds	181	354	215	387	
ASTM Yarn Grade	D	D+	D+	C+	
<u>PERFORMANCE</u>					
Number of Breaks	18		9		
Break Rate/1,000 rotor hrs	90.0		51.0		

*Stelometer

SPECIAL COTTON CONFERENCE FOR MEXICAN COMPANY

In addition to the Johnson & Johnson program, we received a request from Alfonso Rivero Carvallo Z. y Coproprietarios of Puebla, Mexico, for a concentrated course in cotton fiber technology. This was held at the International Center on July 18-20 for three participants. Mr. Alfonso Rivero Carzallo Z. and Alfonso Rivero Sabugo came from the company mentioned above, while Carlos A. Cue Fernandez came from La Reforma, also located in Puebla. La Reforma is a spinning company that produces carded and combed yarns.

Inasmuch as this program was of only three days duration, it was necessary to present the subject matter quite rapidly. Special emphasis was placed on HVI testing and how the results from this can be used to improve spinning efficiency and yarn quality. Several of the researchers from the International Center participated in the lectures and laboratory sessions, each specializing in a given area.

We were pleased to have this group with us. We look forward to having them and others from their respective companies for another conference at some time in the future.

VISITORS

Visitors at the International Center during July included Siegfried Prueckel, Schlafhorst Inc., Charlotte, NC; C. Harvey Campbell, Jr., Harvey Campbell & Associates, Inc., Bakersfield, CA; Dan Stokes, Rieter Corporation, Spartanburg, SC; Roger Bolick, Allied Fibers, Hopewell, VA; John T. Childers and Seburn Crocker, Henkel Corporation, Charlotte, NC; Frank Thompson, Levelland, TX; M/M Lawrence Hahn, Midland, TX; Royce W. Beights and Glenn Reynolds, Western Equipment & Supply, Inc., Loraine, TX; Sally Fox, Fox Fibers, Vasco, CA; and Beth Brookhart, Bakersfield, CA.

Also visiting were Mithat Yener and Davut Yelin, Ziraat Yuksek Muhendisi, Adana, Turkey; Ilhan Yucel, A&Y Associates, Ankara, Turkey; and A. Subramaniam, Subramaniam & Co., Coimbatore, India.

In addition to these, twenty growers from the Southeastern cotton producing area who were participating in the National Cotton Council PIE program visited the Center. Included in this group were Alan Marsh, Madison, AL; Ronnie K. Terry, Decatur, AL; Oscar H. Jones, Jr., Prattville, AL; Cleve Mobley, Waynesboro, GA; Larry Dunaway, Hawkinsville, GA; Mike Newberry, Arlington, GA; Gary Allen Hendrix, Rawford, NC; R. L. Umphlett, Jr., Gates, NC; Roy Baxley, Dillon, SC; and Sammy Rhodes, Mayesville, SC. Accompanying the group were Ken Bretches, Soybean Digest, Kansas City, MO; Daney D. Kepple, Sewanee, TN; and Fred Middleton, National Cotton Council, Memphis, TN.

Other groups included twenty cotton producers from the Moree area of New South Wales, Australia, who came with representatives of ICI Americas; and 25 officers from various Texas chapters of the Future Farmers of America.