



## TEXAS INTERNATIONAL COTTON SCHOOL

The third class of the Texas International Cotton School was held at the International Center for Textile Research and Development October 1-19, 1990. Twenty-two students from eight countries were enrolled.

This school is sponsored by the Lubbock Cotton Exchange and two classes are held each year, one in the fall and the other during the spring. The next class is scheduled for April 1-19, 1991.

Students attending Class III were:

**from Australia:** Robert V. Imber, Auscott, Ltd., Moree, New South Wales; and James Woodrow, Nemoi Cotton Co-op, Wee Waa, New South Wales;

**from England:** Stephen C. Johnson, A. Meredith Jones & Co., Ltd., Liverpool;

**from Pakistan:** Rahat Aziz, Khadim Hussain, Shafiq Hussain, Tanveer A. Khan, Mushtaq A. Khanzada, Waheed Khalid, Khalid Mehmood, Atta E. Rabhani, Inayat A. Soomro and Mohammed S. Ullah, all

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*Contact the address given on page 2 for  
Texas International Cotton School  
admission information.*

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from Pakistan Cotton Standards Institute, Karachi;  
**from Paraguay:** Raquel Zillich, Cono, S.R.L., Asuncion;

**from The Phillipines:** Juliet C. Falsis, Lucky Textile Mills, Inc., Malhacan, Meycauayan;

**from Thailand:** Manop Tungnithiboon, Thai Durable Textile Co., Samutprakarn;

**from Venezuela:** Lawrence S. Frank, Lyntex, C.A., Caracas; and Abraham Trujillo Gams and Nelly G. Trujillo, Prodalam, C.A., Caracas;

**from the United States:** Priscilla Andrew, USDA-FAS, Washington, DC; Edward J. Hanslik, Austin, TX; and Grady K. Stowe, Vernon, TX.



## COTTON YARNS

### PRODUCED BY SIRO SPINNING

An interesting project conducted at the International Center during the past year was a study of producing 100% cotton yarns by the Siro spinning system.

The Sirospun process was patented and developed by the Commonwealth Scientific and Industrial Research Organization of Australia (CSIRO) and subsequently marketed by Wool Development International (WDI), Ilkley, England. The principle of the Sirospun process is that of gandrelle yarn production, in which two separated rovings are fed through the drafting zone of a ring-spinning machine, and the two bundles of fibers are combined by twist at the front rollers. The heart of the process is the break-out device which is a simple mechanical means of causing the yarn to be broken if one of the bundles of fibers is interrupted from combining with its counterpart. The process has been successfully applied to the worsted industry but has not been introduced to the shorter-staple machinery to any great extent.

The objectives of our study were to:

- quantify the benefits of cotton Siro yarn properties;
- assess the influence of roving spacing on Siro yarn quality;
- determine the influence of fiber properties on yarn properties; and
- assess any interaction between roving spacing and fiber properties.

A Saco Lowell Spinomatic ring machine was equipped with 40 break-out devices and roving guides donated by Wool Development International. Guides within the drafting zone were replaced by sections of combs from a slasher to permit easy variation of roving spacing.

These combs were formed of vapour-blasted chrome pins of 0.063 inches diameter (1.6 mm) spaced 0.063 inches apart (1.6 mm). The separation of the roving could, therefore, be made in increments of about 0.125 inches (4.8 mm), and 0.313 inches (7.9 mm).

Spinning was performed at a spindle speed of 10,500 rpm, or at a delivery speed of 16.7 yds/minute, whichever was the limit. Cottons of various lengths and micronaire values were used as feed stock for one to three yarns each. Each yarn was spun using progressively increasing roving spacings until spinning was clearly unstable. Samples of each yarn were characterised by testing their tensile

## FUTURE COTTON CLASSES

As we have already mentioned, Class IV of the Texas International Cotton School is scheduled for April 1-19, 1991. Class V will be conducted October 7-25, 1991. Information on admission to these classes may be obtained by contacting the

**Texas International Cotton School  
c/o Lubbock Cotton Exchange  
1517 Texas Avenue  
Lubbock, Texas 79401**

The telephone number is (806) 763-4646, and the Fax number is 806-763-8647.

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and regularity properties. Spinning specifications and test results are illustrated by the table on the facing page.

The following conclusions were made upon completion of this study:

1. Supplying fiber from two rovings and the use of a higher draft gave a ring-spun yarn of higher strength and improved regularity.
2. A further increase in yarn strength was obtained by keeping the rovings separate throughout the drafting system and combining them upon emergence from the front rolls of the spinning machine to produce a Siro yarn. While the nep counts in Siro yarn were slightly greater, thin places were slightly less than in yarn from double-creeled roving.
3. As roving spacing increased, there was a tendency for yarn strength to increase slightly, perhaps at the expense of elongation at break. Non-uniformity was little influenced, but yarn hairiness was reduced significantly.
4. Spinning performance deteriorated as roving spacing increased, making the production of relatively fine yarns from shorter cottons more difficult.
5. Regression analyses demonstrated that yarn property estimation equations can be derived for Siro yarns in the same manner as single yarns. In general, the same fiber properties which influence an attribute of single yarn also affect the same property in a Siro yarn.
6. General equations for the properties of both single and Siro yarns can be derived which include functions of yarn number and twist multiplier.

RING SPINNING TRIAL RESULTS

<b>FIBER DATA</b> (Individual Inst.)					
Tensile:	Strength (g/tex)	26.31			
	Elongation (%)	5.58			
Length:	2.5% Span (in)	1.035			
	Uniformity Ratio (%)	45.9			
	S.F. Content (%)	4.72			
	Micronaire	4.57			
	Pressley Strength (MPSI)	104.8			
	Non-Lint Content (%)	2.92			
<b>ROVING</b>		2 x 1.8 hank			
Machine		Saco Lowell SCB-17B Spinomatic			
Nominal Yarn Number ( $N_e$ )		22/2			
Ring Diameter (in)		1-7/8			
Spindle Speed (rpm)		9000			
Traveller		9			
Draft (Break)		1.94			
Draft (Total)		ca. 12.4			
Twist Multiplier ( $\alpha_e$ )		4.52			
Yarn Speed (yd/min)		16.6			
Roving Spacing (nominal, mm)		0	1.6	4.8	7.9
Ambient Conditions		72°F/55% RH			
Test Duration (spinning hrs.)		10			
<b>YARN PROPERTIES</b>					
Skein Test:					
	Yarn Number ( $N_e$ )	11.34	11.40	11.51	11.52
	CV% of Count	1.0	1.0	0.4	1.5
	Count-Strength-Product	2819	2897	2987	3032
	CV% of CSP	2.9	6.6	2.4	1.7
Single Yarn Tensile Test:					
	Tenacity (g/tex)	18.81	18.45	19.09	19.10
	Mean Strength (g)	979	955	979	979
	CV% of Strength	8.8	6.6	8.6	8.7
	Elongation (%)	7.20	6.79	6.69	6.64
	CV% of Elongation	7.4	5.9	6.5	5.8
	Spec. Work/Rupture (g/tex)	0.615	0.584	0.595	0.593
	CV% of Work of Rupture	12.7	10.9	13.2	12.8
	Initial Modulus (g/tex)	196	220	247	241
Uster Evenness Test:					
	Non-Uniformity (CV%)	15.83	16.11	16.16	16.01
	Thin Places/1,000 yds	20	26	36	24
	Thick Places/1,000 yds	110	131	131	140
	Neps/1,000 yds	49	52	62	58
	Hairs/100 yds	1457	1379	797	635
	ASTM Yarn Grade	B	C	C	C
<b>PERFORMANCE:</b>					
	Number of Breaks	0	0	1	1

7. Maximum yarn strength occurs at a higher twist multiplier in Siro yarns, about 4.5, than in single yarns.

The information given here was taken from a report prepared by John B. Price, assistant director of the International Center, for the Texas Food and Fiber Commission, sponsor of this research.

## VISITORS

Visiting lecturers for the Texas International Cotton School were Charles V. Cunningham, USDA/ASCS, Washington, DC; Joseph J. O'Neill, New York Cotton Exchange, New York, NY; Tom Bell, ContiCotton, Washington, DC; and Ray Clarke, P. C. Bradford & Co., Nashville, TN.

Additionally, on October 16 a delegation of 35 textile mill executives from Europe and Asia, participants in the 1990 Cotton USA Orientation Tour sponsored by Cotton Council International, National Cotton Council of America and USDA's Foreign Agricultural Service, visited the Center. The textile executives represented 14 countries including Bangladesh, Denmark, Finland, Greece, Hong Kong, Indonesia, Italy, Japan, Korea, Malaysia, Norway, the Philippines, Taiwan and the United Kingdom. The group was accompanied by Ron Read, USDA-AMS, Washington, DC; Will Bettendorf, Cotton Council International, London, England; Timothy C. Heberlein, Cotton Council International, Seoul, Korea; and Buxton Midyette and Vaughn Jordan, Cotton Council International, Washington, DC.

Then, on October 24 the National Cotton Council's 1990-91 Cotton Leadership Class came to the Center. The group included Ben Hillsman, Jr., Roanoke Rapids, NC; Murry Garrott McClintock, Tunica, MS; Allen Lee Tiller, Odem, TX; Lawrence Edward Starrh, Shafter, CA; John Franklin Visic, Casa Grande, AZ; Eugene Bragg Smith, III, Dallas, TX; Gerald Carter Marshall, Memphis, TN; Guy Fred Wallace, Greenwood, MS; James Steve Creamer, Milliken & Co., Spartanburg, SC; and William David Stamford, Plains Cotton Cooperative Assn., Lubbock, TX. Doyle K. Needham, National Cotton Council, Memphis, TN, accompanied the leadership class.

Other visitors included Brian Muller, Texas Department of Agriculture, Austin, TX; Lanny T. Kinsler, John D. Hollingsworth on Wheels, Greenville, SC; Bill J. Wright, Jr., Platt Saco Lowell, LaGrange, GA; Doug Anderson, Texas Department of Corrections, Huntsville, TX; Jack R. Mace, Jr., Calgene, Memphis, TN; H. B. Cooper, Phytogen, Corcoran, CA; Clayton Williams, Midland, TX; and Gerald Gohkle and Joe Cristan, PCCA Denim Mill, Littlefield, TX.

Also, Simon Clancy, Ralli Brothers & Coney, Carole Park, Queensland, Australia; P. Chellamani, South India Textile Research Assn., Coimbatore, India; Mustafa Mohamed El-Hassan, Sudan Gezira Board, Sudan; Huang Wanpo and Yuan Xiaofeng, China Assn. for Scientific Expeditions, Beijing, People's Republic of China; Ivana Hecova, Centrotex, Praha, Czechoslovakia; Jaroslav Vonka, Kolora, Semidy, Czechoslovakia; and Vlastimil Dana, Slezan Baumwollbetriebe, Frydek-Mistek, Czechoslovakia.

Finally, eighteen students from Eastern New Mexico University, Portales, NM; 30 students from Floydada High School, Floydada, TX; and 13 members of the Texas Council for Social Studies, from various cities in Texas, visited the Center during the month.