



## QUALITY OF 1991 TEXAS COTTON CROP

Every year since 1980 an assessment of the Texas cotton crop has been performed at the International Textile Research Center. The program has been sponsored throughout by the Texas Food and Fibers Commission (TFFC) and culminates each year in the publication of a booklet containing all the test data, both fiber and yarn. The data provided not only gives the industry an overview of the quality of cotton produced in any particular harvest, but also permits analyses to identify improvements with time, for example. The results of such an analysis were presented in the August 1991 issue of *Textile Topics* (Vol. XIX, Number 12). We are grateful to the TFFC for sponsoring what we consider to be a very valuable service.

For this evaluation, at least two bales of cotton are obtained from each district administered by a cotton classing office of the Agricultural Marketing Service of the United States Department of Agriculture. There are eight such offices which class Texas cottons. These are located in Abilene, Altus (Oklahoma), Corpus Christi, El Paso, Harlingen, Lamesa, Lubbock and Waco. We attempt to purchase a bale of each of the most popular varieties grown in each area, whose properties are representative of that cotton's performance.

During the past eleven years, there have been changes in the program. Besides the relocation of the Center from Texas Tech University's main campus to the East Research facility (1987), the blowroom was considerably upgraded by the acquisition of a Rieter opening line and C4 card (1989) and we have also been fortunate in having at our disposal state-of-the-art rotor spinning machines. In 1980, manually-operated rotor spinning machines were dominant throughout the industry, and for the first few crop evaluations the Rieter m1/1 and Platt T.883 machines were used. Later studies have been conducted with Schlafhorst Autocoro machinery, commencing in 1986 at rotor speed of 80,000 rpm and increasing to 90,000 rpm in 1987 as smaller rotors became available for the SE-8 design of spinbox. Currently, the ro-

tor spinning specification is 100,000 rpm using SE-9 units. Table I (below) gives both rotor and ring spinning specifications.

Traditionally, two rotor spinning machines have been used to evaluate the cottons. The Rieter m1/1 machine has been used every year to provide a benchmark for comparison purposes. Similarly, ring spinning has been performed on every cotton, giving yet another means of reference. In the past, analyses have been performed with some sets of data emanating from this program and another appraisal is now in progress. We hope there will be some useful information forthcoming to share with our readers in a future issue of *Topics*.

Particularly in the High Plains of West Texas, the quality of the 1991 crop was marred by an early freeze which occurred on October 30, followed by much wet weather. Harvesting was severely hampered and conditions were conducive to the production of trashy and barky cotton. Some evidence of this can be seen in the data presented for the two cottons in Tables II and III on the next pages. Despite the high trash contents, as indicated by the non-lint contents of 5.6% and 9.3%, respectively, the properties of the fibers were acceptable and generally representative of expectations (continued on back page)

TABLE I  
SPINNING SPECIFICATIONS

(a) ROTOR SPINNING

Sliver	55 gr/yd Finisher Drawframe					
	Rieter m1/1			Schlafhorst Autocoro		
Machine	10	22	30	10	22	30
Nominal Yarn Number (N <sub>g</sub> )						
Rotor Type	45 N St			T31		
Rotor Speed (rpm)	55,000			100,000		
Opening Roller Type	T.52			B 174 DN		
Opening Roller Speed (rpm)	6700			7200		
Draft (approximate)	66	145	198	66	145	198
Twist Multiplier (α <sub>e</sub> )	4.85	4.80	4.78	4.78	4.79	4.79
Yarn Speed (yd/min)	99.5	67.7	58.3	183.8	123.7	105.9
Naval	Smooth Steel			4-grooved Ceramic		

(b) RING SPINNING

Roving Frame	Saco Lowell
Flyer Speed (rpm)	1425
Roving	1.0 hank
Ring Spinning Frame	Saco Lowell SF-3H
Spindle Speed (rpm)	10,000
Ring Diameter (in)	2
Twist Multiplier (α <sub>e</sub> )	4.00

FIBER PROPERTIES

<u>Individual Instrument Data</u>			<u>HVI Data: MCI 3000</u>			<u>HVI Data: Spinlab 900</u>				
Stelometer Strength	26.1	g/tex	1/8" Gauge Strength	28	g/tex	1/8" Gauge Strength	26.3	g/tex		
Elongation	8.00	%	Elongation	8.2	%	Elongation	7.9	%		
2.5% Span Length	1.07	in.	Length	1.06	in.	Length	1.06	in.		
Uniformity Ratio	47.0	%	Uniformity Ratio	85	%	Uniformity Ratio	84.2	%		
Short Fiber Content	4.87	%	Micronaire Value	4.3		Micronaire Value	4.2			
Micronaire Value	4.20		Reflectance	66		Reflectance	67.6			
Pressley Strength	84	Mpsi	Yellowness	10.2		Yellowness	10.3			
Shirley Non-lint Content	4.45	%	Index of - Color	43	- Leaf	2	Index of: - Color	43	- Leaf	5
IIC/Shirley F/MT III	Micronaire:	4.2	Fineness:	174	mtex	Percent Mature Fibers: 80.0				
Peyer Texlab AL-101	Upper Quartile Length:	1.01 in	Mean Length:	0.83 in	CV% of Mean:	29.9	Percent Short Fibers: 12.4			

YARN PROPERTIES

Spinning Machine:	Rieter m1/1			Schlafhorst Autocoro			Saco Lowell SF-3H Ring		
Nominal Yarn Number (N <sub>e</sub> )	10/1	22/1	30/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Twist Multiplier (α <sub>e</sub> )	4.85	4.81	4.78	4.78	4.79	4.79	4.0	4.0	4.0
<u>Skein Test:</u>									
Yarn Number (N <sub>e</sub> )	9.97	22.15	30.42	10.02	22.07	29.89	15.72	21.51	30.23
CV% of Yarn Number	0.6	0.9	0.8	0.6	0.5	0.9	0.6	1.0	0.8
Count-Strength-Product	2394	1972	1906	2519	2051	1878	2401	2297	2170
CV% of CSP	2.9	2.2	2.7	1.4	1.0	4.5	2.1	3.1	2.3
<u>Single-Yarn Strength Test:</u>									
Tenacity (g/tex)	13.80	12.82	12.17	14.21	12.68	11.90	15.56	14.60	13.79
Mean Strength (g)	818	342	236	837	339	235	584	401	269
CV% of Break	6.2	8.7	10.6	5.4	8.0	9.3	9.0	9.6	10.5
Elongation (%)	7.56	6.64	6.18	7.79	6.91	6.44	7.74	6.77	6.19
CV% of Elongation	7.4	9.0	10.7	6.3	7.3	8.3	7.9	10.4	9.8
Specific Work of Rupture (g/tex)	0.601	0.477	0.424	0.625	0.489	0.419	0.618	0.527	0.450
CV% of Work of Rupture	11.9	15.9	19.2	10.8	14.1	15.8	14.7	16.6	17.7
Initial Modulus (g/tex)	257	248	296	212	234	239	200	282	262
<u>Uster Evenness Test:</u>									
Non-Uniformity (CV%)	13.32	15.40	17.74	13.52	14.52	16.63	16.47	18.54	21.78
Thin Places/1,000 yds	2	38	189	2	21	136	41	152	511
Thick Places/1,000 yds	78	152	369	122	75	209	262	636	1313
Neps/1,000 yds	79	242	1018	144	106	634	171	336	780
ASTM Yarn Grade	B+	C	C+	B+	B	B	B	B	C

## FIBER PROPERTIES

Individual Instrument Data			HVI Data: MCI 3000				HVI Data: Spinlab 900			
Stelometer Strength	24.5	g/tex	1/8" Gauge Strength	27	g/tex	1/8" Gauge Strength	26.6	g/tex		
Elongation	7.58	%	Elongation	7.6	%	Elongation	6.6	%		
2.5% Span Length	1.04	in.	Length	1.03	in.	Length	1.04	in.		
Uniformity Ratio	43.2	%	Uniformity Ratio	81	%	Uniformity Ratio	82.4	%		
Short Fiber Content	9.20	%	Micronaire Value	4.1		Micronaire Value	3.9			
Micronaire Value	3.90		Reflectance	62		Reflectance	64.4			
Pressley Strength	86	Mpsi	Yellowness	9.6		Yellowness	10.3			
Shirley Non-lint Content	9.30	%	Index of - Color	53	- Leaf	4	Index of: - Color	53	- Leaf	7
IIC/Shirley F/MT III	Micronaire: 3.9		Fineness: 165	mtex		Percent Mature Fibers: 75.0				
Peyer Texlab AL-101	Upper Quartile Length: 0.99in		Mean Length: 0.81 in			CV% of Mean: 32.1			Percent Short Fibers: 15.3	

## YARN PROPERTIES

Spinning Machine:	Rieter m1/1			Schlafhorst Autocoro			Saco Lowell SF-3H Ring		
Nominal Yarn Number ( $N_e$ )	10/1	22/1	30/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Twist Multiplier ( $\alpha_e$ )	4.85	4.81	4.78	4.78	4.79	4.79	4.0	4.0	4.0
<b>Skein Test:</b>									
Yarn Number ( $N_e$ )	10.05	22.19	30.10	10.06	21.86	30.09	16.04	23.17	29.62
CV% of Yarn Number	0.7	0.7	0.5	0.5	0.5	0.8	1.3	1.8	2.7
Count-Strength-Product	2250	1839	1739	2371	1866	1766	2205	1960	1899
CV% of CSP	1.9	2.9	2.2	1.7	2.0	2.6	2.9	3.5	4.1
<b>Single-Yarn Strength Test:</b>									
Tenacity (g/tex)	13.23	12.11	11.46	13.64	12.14	11.53	14.18	13.25	12.71
Mean Strength (g)	778	322	225	800	328	226	522	338	254
CV% of Break	5.1	8.4	9.0	6.3	8.2	9.2	11.3	9.7	12.0
Elongation (%)	7.05	6.21	5.72	7.31	6.44	6.02	6.60	5.73	5.54
CV% of Elongation	6.8	8.3	9.5	6.3	7.4	8.4	12.9	10.9	13.1
Specific Work of Rupture (g/tex)	0.546	0.422	0.367	0.569	0.440	0.382	0.506	0.415	0.375
CV% of Work of Rupture	9.9	14.8	16.5	11.4	14.7	16.0	18.8	17.5	20.8
Initial Modulus (g/tex)	273	269	277	216	237	237	255	278	299
<b>Uster Evenness Test:</b>									
Non-Uniformity (CV%)	12.82	14.83	17.00	12.97	13.76	16.04	19.05	21.48	24.43
Thin Places/1,000 yds	1	33	114	1	11	92	212	491	1086
Thick Places/1,000 yds	38	102	244	89	40	141	568	1167	1979
Neps/1,000 yds	44	176	708	110	48	510	105	210	758
ASTM Yarn Grade	A	B	B	B+	B	B	B	D+	D

## **QUALITY OF 1991 TEXAS COTTON CROP (cont'd)**

from this area.

The 1991 study included seventeen cottons. The data have been compiled in a report which is available upon request. We invite our readers' comments and suggestions regarding this program.

As stated, this project is sponsored each year by the Texas Food and Fibers Commission. It is conducted under the supervision of John B. Price, assistant director of ICTRD.

## **ADDRESS UPDATE HELP NEEDED –2nd NOTICE**

As mentioned last month, the time has come for updating our mailing list, and we ask your help with this. We thank those who already have written or called. However, we have not heard from many of you. So to repeat, we need to know if there has been a change in the address of your organization or a change of personnel, or if you know someone who would like to receive *Textile Topics* but is not on our current mailing list.

Likewise, we need to know if you want to continue receiving *Textile Topics* or if you would like for your name to be removed from the list.

**REMEMBER – We need this information before September 1992, which is the beginning of a new fiscal year for us. If we have not heard from you by that time, your name will be automatically removed from our *Textile Topics* mailing list.**

## **VISITORS**

Visitors to the Center during March included David Clapp, Raouf S. Taraboulsi and Thomas D. Valco, Cotton Incorporated, Raleigh, NC; Phillip Benson Truman and Jonas Lima Nobre, Jr., Sao Paulo Alpargatas S.A., Sao Paulo, Brazil; Hans Landwehrkamp, Schubert & Salzer Maschinenfabrik AG, Ingolstadt, Germany; and Heinrich Stori, Maschinenfabrik Rieter AG, Winterthur, Switzerland.

Classes from several area schools also visited during the month. These included eleven students from Roosevelt High School, Lubbock; 23 from Amherst High School, Amherst, TX; 36 from Seminole High School, Seminole, TX; and 51 from Littlefield High School, Littlefield, TX.