



EVALUATION OF 1983 TEXAS COTTON CROP In December 1979, the Natural Fibers & Food Protein Commission of Texas (NFFPC) requested that the Textile Research Center evaluate the 1979 Texas cotton crop by complete fiber and spinning tests. This was conducted during the early months of 1980. Since that time, NFFPC has continued to sponsor an annual evaluation of Texas cotton. In this issue of *Textile Topics* we are presenting a partial report on the quality of the 1983 Texas cotton crop.

The purpose of these annual evaluations is to determine the quality of the cotton produced commercially in Texas and compile the results of the study in a report that will be useful to cotton producers and textile manufacturers. While it is impossible to test every bale of cotton, or even a high percentage of the Texas production, an attempt is always made to find typical cottons that will represent the production from various areas of the state. The eighteen bales included in the 1983 evaluation came from the Rio Grande Valley, the Coastal Bend area, the Rolling Plains of Central Texas, the High Plains of West Texas, and the El Paso area. We feel the information included in the report properly represents the cottons produced in Texas last year.

It is interesting for those who have worked for many years in the development of Texas cotton to note the quality changes that have taken place. Twenty years ago the average length (except for the extra-long staple produced in the El Paso area) was 15/16 of an inch. It is recalled that considerable effort was made during the early 1960's to increase the staple length which was important to ring spinning, the only method of manufacturing yarns at that time. Besides that, the marketing of cotton involved staple length and longer fibers would mean more money for producers. As a result of that effort, we find today that the length produced in this area is significantly longer, and two-thirds of the cotton included in this most recent evaluation was over one inch. The range of staples included in the full report was from 15/16 to 1-5/32 inch. It seems a little ironic, now that the length of Texas cotton has increased, that much of the production from this area is used for open-end spinning. The irony is that fiber length is not nearly so important to open-end spinning as it is to ring spinning.

Space does not permit us to carry the entire 1983 report, but we have selected fiber and yarn testing results from four lots that seem to be typical. These were selected on the basis of their length, strength and other fiber properties which we feel give a fair representation of the cottons used in the study.

We have already mentioned the length of the cotton included in the evaluation, and it seems appropriate to make some comment about fiber strength also. This appears to be increasingly more important to many textile manufacturers. The range of strength of the cottons in the study was from 22 to more than 29 grams/tex. The four lots selected for this issue of *Topics* range from about 23 to 27 grams/tex. Because we feel the values in these four tests more accurately represent the cotton produced in Texas last year, we have intentionally kept away from the extremes.

In the following tables, we are presenting fiber testing results from individual instruments, the Motion Control HVI 3000 System, and the Spinlab HVT 800 Series. While these three methods of measuring fiber properties show some variation, it must be remembered that the exact same sample was not used with each of the three separate systems, and the variation between samples taken from the same bale must be considered. (See *Textile Topics* Volume X, No. 11.)

Fiber testing was done by Mrs. Reva Whitt, head of our materials evaluation laboratory, and her staff of technicians. Ring spinning was supervised by Edwin R. Foster, head of TRC's mechanical processing laboratory, and open-end spinning by John B. Price, head of open-end spinning research, and his staff. As mentioned, this program was sponsored by the Natural Fibers & Food Protein Commission of Texas.

TABLE II

LOT NUMBER 907

FIBER PROPERTIES

Individual Instrument Data		HVI Data: MCI 3000		HVI Data: Spinlab 800	
Stelometer Strength	23.69 g/tex	1/8" Gauge Strength	22.8 g/tex	1/8" Gauge Strength	23.6 g/tex
Elongation	5.00 %	Elongation	6.06 %		
2.5% Span Length	0.973 in.	UHM Length	0.968 in.	2.5% Span Length	1.04 in.
Uniformity Ratio	48.2 %	Uniformity Ratio	79.0 %	Uniformity Ratio	47 %
Short Fiber Content	4.77 %				
Micronaire Index	4.68	Micronaire Index	4.70	Micronaire Index	4.7
Pressley Strength	92.2 Mpsi				
Shirley Non-lint Content	1.80 %	Color Index	31.2	Grade	31.1

YARN PROPERTIES

Spinning Machine	Rieter M1/1 (OE)				Platt T.883 Side-Feed (OE)				Saco Lowell Ring Frame		
	6/1	10/1	16/1	22/1	6/1	10/1	16/1	22/1	16/1	22/1	30/1
Nominal Yarn Number (N ₀)	6/1	10/1	16/1	22/1	6/1	10/1	16/1	22/1	16/1	22/1	30/1
Nominal Twist Multiplier (α ₀)	4.78	4.84	4.79	4.80	4.78	4.84	4.87	4.80	4.00	4.00	4.00
Skein Test:											
Actual Yarn Count (N _g)	6.00	10.16	16.02	22.17	6.97	9.93	15.84	21.46	18.66	22.28	30.18
CV% of Count	0.8	0.8	0.8	1.0	1.3	1.4	1.3	1.4	1.8	1.5	1.8
Skein Strength (lbs)	403.6	224.2	130.7	85.7	398.0	223.3	126.3	83.8	122.1	93.4	61.6
CV% of Strength	1.9	1.4	2.4	2.6	2.4	3.6	2.6	3.7	7.2	3.4	5.0
Count Strength-Product	2421	2277	2096	1903	2376	2216	1992	1784	2044	2066	1860
CV% of CSP	2.0	1.1	2.0	2.4	1.8	2.5	1.9	3.0	6.3	2.4	3.7
Single Yarn Strength Test:											
Tenacity (g/tex)	15.06	14.99	13.89	13.46	16.06	14.46	13.31	12.62	14.96	14.10	14.21
Mean Strength (g)	1481	870	612	369	1489	869	498	347	622	378	278
CV% of Break	7.8	6.8	8.0	9.7	7.9	7.3	8.5	11.3	10.2	13.2	11.9
Elongation (%)	6.52	6.99	6.83	6.01	7.06	6.42	6.51	6.24	4.76	4.99	4.67
CV% of Elongation	6.6	6.7	6.5	9.0	6.7	6.5	6.9	9.4	12.2	9.0	13.8
Specific Work of Rupture (g/tex)	0.634	0.486	0.410	0.372	0.666	0.499	0.398	0.363	0.380	0.360	0.329
CV% of Work of Rupture	12.7	12.2	12.7	18.3	11.4	11.9	13.2	17.2	17.3	19.2	23.2
User Evenness Test:											
Non-Uniformity (CV%)	16.41	16.07	16.77	17.93	16.97	16.69	16.97	17.24	18.70	20.89	23.07
Thin Places/1,000 yds	8	21	76	134	6	12	29	92	169	355	712
Thick Places/1,000 yds	111	163	189	301	108	66	96	177	418	903	1386
Neps/1,000 yds	78	164	198	410	38	81	128	246	72	137	348
Hair Count/100 yds	420	310	180	117	293	177	108	74	1286	1797	1258
ASTM Yarn Grade	C+	D+	B	B	C+	C+	B	B	B	C	D+

TABLE VI

LOT NUMBER 916

FIBER PROPERTIES

Individual Instrument Data		HVI Data: MCI 3000		HVI Data: Spinlab 800	
Stelometer Strength	27.60 g/tex	1/8" Gauge Strength	27.8 g/tex	1/8" Gauge Strength	27.0 g/tex
Elongation	5.83 %	Elongation	6.76 %		
2.5% Span Length	1.100 in.	UHM Length	1.085 in.	2.5% Span Length	1.13 in.
Uniformity Ratio	48.2 %	Uniformity Ratio	82.0 %	Uniformity Ratio	48 %
Short Fiber Content	1.60 %				
Micronaire Index	4.70	Micronaire Index	4.66	Micronaire Index	4.6
Pressley Strength	94.1 Mpsi				
Shirley Non-lint Content	1.66 %	Color Index	21.3	Grade	11.2

YARN PROPERTIES

Spinning Machine	Rieter M1/1 (OE)				Platt T.883 Side-Feed (OE)				Saco Lowell Ring Frame			
	6/1	10/1	16/1	22/1	6/1	10/1	16/1	22/1	16/1	22/1	30/1	50/1
Nominal Yarn Number (N ₀)	6/1	10/1	16/1	22/1	6/1	10/1	16/1	22/1	16/1	22/1	30/1	50/1
Nominal Twist Multiplier (α ₀)	4.78	4.84	4.79	4.80	4.78	4.84	4.87	4.80	4.00	4.00	4.00	4.00
Skein Test:												
Actual Yarn Count (N _g)	6.04	10.23	15.68	21.87	6.03	9.70	15.68	21.34	16.83	22.57	29.06	48.92
CV% of Count	0.9	1.0	1.0	1.5	1.6	1.1	1.7	1.3	1.3	1.4	1.9	2.2
Skein Strength (lbs)	443.1	266.6	159.2	106.2	222.3	272.8	151.7	97.8	174.4	113.9	90.2	45.6
CV% of Strength	2.3	1.8	1.7	1.7	3.7	2.6	2.1	5.9	2.4	3.2	2.9	2.6
Count Strength-Product	2676	2628	2472	2209	2683	2641	2356	2078	2768	2581	2604	2207
CV% of CSP	2.1	1.1	1.4	1.6	3.3	2.2	1.5	4.7	2.2	2.8	2.3	2.6
Single Yarn Strength Test:												
Tenacity (g/tex)	16.22	16.10	15.32	14.93	16.68	15.83	14.72	14.05	16.41	17.71	16.90	15.89
Mean Strength (g)	1585	936	581	403	1634	964	558	389	687	463	344	192
CV% of Break	6.7	6.1	7.7	7.7	6.7	7.5	9.7	9.1	9.7	11.5	10.0	16.6
Elongation (%)	6.54	6.13	5.83	5.40	7.40	6.71	6.89	5.66	6.37	5.35	5.28	4.71
CV% of Elongation	6.3	6.3	6.9	7.8	6.3	7.4	8.4	7.7	8.4	9.1	7.3	12.3
Specific Work of Rupture (g/tex)	0.585	0.641	0.478	0.436	0.648	0.566	0.465	0.426	0.672	0.485	0.456	0.368
CV% of Work of Rupture	11.3	11.6	13.7	14.7	11.3	13.1	15.5	14.1	15.9	18.3	15.9	25.7
User Evenness Test:												
Non-Uniformity (CV%)	14.42	14.86	15.56	16.56	15.01	14.77	15.48	16.61	15.94	17.87	19.81	22.61
Thin Places/1,000 yds	3	6	23	65	4	4	15	82	32	126	259	640
Thick Places/1,000 yds	67	86	117	217	62	63	73	130	126	350	696	1406
Neps/1,000 yds	58	82	80	241	24	40	78	179	38	49	118	391
Hair Count/100 yds	468	301	181	132	361	198	117	97	787	1061	1131	1440
ASTM Yarn Grade	B	C+	B+	B+	B	B+	B+	B+	A	B+	C+	D+

TABLE XIV

LOT NUMBER 1517

FIBER PROPERTIES

Individual Instrument Data			HVI Data: MCI 3000			HVI Data: Spinlab 800		
Stelometer Strength	25.59	g/tex	1/8" Gauge Strength	26.0	g/tex	1/8" Gauge Strength	26.3	g/tex
Elongation	6.58	%	Elongation	5.95	%			
2.5% Span Length	1.030	in.	UHM Length	1.013	in.	2.5% Span Length	1.07	in.
Uniformity Ratio	47.3	%	Uniformity Ratio	80.5	%	Uniformity Ratio	46	%
Short Fiber Content	2.30	%						
Micronaire Index	3.75		Micronaire Index	3.90		Micronaire Index	3.7	
Pressley Strength	85.35	Mpsi						
Shirley Non-lint Content	3.90	%	Color Index	32-1		Grade	32-2	

YARN PROPERTIES

Spinning Machine	Rieter M1/1 (O-E)				Platt T.883 Side-Feed (O-E)				Saco Lowell Ring Frame		
	6/1	10/1	16/1	22/1	6/1	10/1	16/1	22/1	16/1	22/1	30/1
Nominal Yarn Number (N _e)	4.78	4.84	4.79	4.80	4.78	4.84	4.87	4.80	4.00	4.00	4.00
Nominal Twist Multiplier (C _s)											
Skein Test:											
Actual Yarn Count (N _e)	5.97	10.10	16.03	22.05	6.05	9.76	15.79	21.61	16.28	21.00	29.29
CV% of Count	1.1	1.1	0.8	0.9	1.1	1.1	1.2	1.6	1.6	2.3	2.4
Skein Strength (lbs)	427.3	238.3	141.3	96.3	404.1	243.7	135.9	86.2	133.0	101.0	69.8
CV% of Strength	2.1	1.5	2.4	3.3	2.8	3.2	2.8	2.2	5.5	5.2	5.3
Count-Strength-Product	2551	2408	2265	2125	2447	2373	2111	1856	2170	2174	2030
CV% of CSP	1.7	1.1	2.1	2.7	2.5	3.1	2.4	1.9	5.0	3.6	4.3
Single Yarn Strength Test:											
Tenacity (g/tex)	15.36	14.88	14.22	13.07	14.81	14.44	13.19	12.37	16.02	15.26	15.02
Mean Strength (g)	1515	870	524	350	1444	874	500	338	581	417	303
CV% of Break	6.9	7.8	10.2	10.9	7.2	7.1	9.6	10.4	10.7	12.2	12.4
Elongation (%)	8.23	7.49	6.91	6.23	8.10	7.64	6.81	6.14	8.38	6.53	6.18
CV% of Elongation	5.5	6.0	8.4	8.3	6.1	5.9	7.1	8.3	12.5	10.0	12.8
Specific Work of Rupture (g/tex)	0.669	0.601	0.526	0.446	0.643	0.588	0.468	0.420	0.532	0.502	0.466
CV% of Work of Rupture	11.0	12.4	17.2	17.1	11.0	11.2	14.8	16.7	18.8	18.4	20.6
Uster Evenness Test:											
Non-Uniformity (CV%)	15.86	16.26	17.10	17.94	15.67	14.95	15.76	16.75	19.77	21.75	24.63
Thin Places/1,000 yds	12	30	63	106	5	8	15	51	246	499	1050
Thick Places/1,000 yds	127	172	238	373	87	56	102	162	590	1165	1800
Neps/1,000 yds	109	228	300	706	30	74	181	314	176	348	906
Hair Count/100 yds	396	322	171	138	398	250	151	113	976	1215	942
ASTM Yarn Grade	B	D+	B	B+	B	C	C	B	C+	C	D

TABLE XV

LOT NUMBER 1518

FIBER PROPERTIES

Individual Instrument Data			HVI Data: MCI 3000			HVI Data: Spinlab 800		
Stelometer Strength	23.78	g/tex	1/8" Gauge Strength	25.3	g/tex	1/8" Gauge Strength	24.8	g/tex
Elongation	6.08	%	Elongation	5.58	%			
2.5% Span Length	1.008	in.	UHM Length	0.978	in.	2.5% Span Length	1.03	in.
Uniformity Ratio	47.6	%	Uniformity Ratio	81.5	%	Uniformity Ratio	47	%
Short Fiber Content	2.10	%						
Micronaire Index	4.12		Micronaire Index	4.30		Micronaire Index	4.3	
Pressley Strength	86.2	Mpsi						
Shirley Non-lint Content	3.4	%	Color Index	13-2		Grade	33-2	

YARN PROPERTIES

Spinning Machine	Rieter M1/1 (O-E)				Platt T.883 Side-Feed (O-E)				Saco Lowell Ring Frame		
	6/1	10/1	16/1	22/1	6/1	10/1	16/1	22/1	16/1	22/1	30/1
Nominal Yarn Number (N _e)	4.78	4.84	4.70	4.80	4.78	4.84	4.87	4.80	4.00	4.00	4.00
Nominal Twist Multiplier (C _s)											
Skein Test:											
Actual Yarn Count (N _e)	5.90	9.99	15.64	21.80	6.05	9.87	15.82	21.84	16.41	22.60	30.19
CV% of Count	1.0	1.1	1.0	1.5	1.4	1.4	1.6	2.1	2.1	1.3	2.0
Skein Strength (lbs)	423.5	238.6	138.7	92.7	408.0	232.5	125.5	80.4	129.1	89.7	61.8
CV% of Strength	2.1	2.0	2.9	3.1	2.7	3.8	2.4	4.4	5.1	3.4	6.1
Count-Strength-Product	2499	2382	2162	2017	2470	2293	1982	1753	2127	2037	1869
CV% of CSP	1.6	2.2	2.7	2.6	2.7	3.5	2.0	3.7	4.5	3.2	4.5
Single Yarn Strength Test:											
Tenacity (g/tex)	15.20	15.04	13.90	13.19	14.36	14.06	13.36	11.79	15.42	14.34	13.94
Mean Strength (g)	1518	889	530	357	1401	841	499	319	555	375	273
CV% of Break	7.1	8.2	8.6	10.0	8.6	9.6	8.5	9.4	9.9	14.3	12.1
Elongation (%)	7.79	7.09	6.60	5.99	7.38	7.03	6.32	5.51	6.02	5.82	5.64
CV% of Elongation	5.9	6.4	7.1	8.5	7.1	7.8	8.2	9.8	11.2	12.1	11.0
Specific Work of Rupture (g/tex)	0.619	0.568	0.477	0.422	0.574	0.528	0.454	0.359	0.477	0.426	0.395
CV% of Work of Rupture	11.3	13.0	14.6	18.7	13.4	14.7	14.3	16.8	16.0	21.7	18.6
Uster Evenness Test:											
Non-Uniformity (CV%)	16.00	16.60	17.36	18.24	16.19	15.59	16.19	17.04	20.54	22.75	25.24
Thin Places/1,000 yds	18	42	88	128	5	12	24	77	339	659	1164
Thick Places/1,000 yds	130	177	233	370	353	69	107	160	726	1415	1968
Neps/1,000 yds	87	218	270	657	44	85	197	275	189	388	907
Hair Count/100 yds	417	311	156	162	373	204	128	85	1121	1630	1207
ASTM Yarn Grade	B	D+	B	B	C+	C	C	C+	C+	D	D

VISITORS We were pleased to have twenty-six members of the Texas Cowbelles Association come to the Textile Research Center for a visit and tour on April 27. Several classes from area colleges and high schools also toured the Center during April.

Other visitors included Glenn Morton, Cotton Incorporated, Raleigh, NC; Barbara Shaeffer and Larry Teague, Motion Control Inc., Dallas, TX; Jack T. Walker and J. T. Walker, Jr., Chickasha Gin Company, Anadarko, OK; Barnett Greenburg, North Texas State University, Denton, TX; Edwin N. Bateman, Mission Valley Mill, New Braunfels, TX; John Long, Textile Machinery & Supply, Richardson, TX; George R. Walker, Jr. and John B. Walker, Stoneville Pedigreed Seed, Stoneville, MS; Karre J. Klovstad, Pariso Glove Company, Knox, IN; and Erik Brambers, Orethro Agricultural Society, Orethro, Sweden.

EXPERIENCE A man could retire nicely in his old age if he could sell his experience for what it cost him.