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A STUDY OF COTTON AGING For almost as long as the textile industry has been using cotton, there have been concerns about the quality of the fiber after storage for a great length of time. Today there are a number of textile manufacturers who do not care to use cotton that has been stored for more than two or three years, although studies have found that it processes quite well and can be spun into yarn of satisfactory quality. In one recent case, a bale of cotton was found to have been stored for 15 years. Although the fiber had changed color somewhat (increased in yellowness), it was still a spinnable material with no apparent physical deterioration. In this instance, no comparison could be made with the quality of the cotton immediately after harvesting and ginning, nor was there an opportunity to compare spinning performance and yarn quality with what it might have been originally.

In the fall of 1981, a textile company approached the Textile Research Center about the possibility of a loss in yarn strength as a result of using cotton stored for more than one year. This prompted TRC to undertake a program which might develop useful information on this subject. The investigation was initiated with the acquisition of six bales similar to the cotton used by the interested spinner. These were all tested separately, and when processing began samples from each bale were blended together. The blend was completely tested and spun into two yarn numbers, N_e 6 and 22, on a Rieter M1/1 rotor-spinning machine.

In this issue of *Textile Topics*, Tables I through VI present fiber testing results from the individual bales. Testing of the blends and spinning results will be given in the next issue. (For clarification of the dates listed in the tables, it should be pointed out that it is our practice in the United States to give the month first, the day of the month second, and then the year. Therefore, June 11, 1982 is expressed as 6/11/82. We mention this because we are aware that in many parts of the world the day of the month is listed first when using abbreviations of this type.) All bales were harvested in the West Texas High Plains region during the latter part of 1981. Inasmuch as this study did not begin until June 1982, some aging had already taken place. We regret that we are not able to give the fiber properties of the six bales just after ginning, but these were not available to us. In fact, the Textile Research Center did not obtain the cotton until March 1982.

The fiber testing results show that the bales were evaluated on an HVI system beginning June 11, 1982 and were tested periodically until May 11, 1983. Following that, testing was scheduled once each year at approximately the same time the program was begun, for as long as the cotton would last. Therefore, the tables carry additional results from evaluating the six bales during April 1984. Portions still remain for further testing and spinning. It appears, however, that we have only enough of each for testing one more year, which will be in the period between April and June 1985.

While we are not presenting conclusions on our findings thus far, we are offering this information to recipients of *Textile Topics* hoping it will be of interest and possibly some use. Sponsorship of this study was provided by the Natural Fibers & Food Protein Commission of Texas. Fiber testing was performed by the staff of our materials evaluation laboratory under the direction of Mrs. Reva E. Whitt.

TABLE I
RESULTS FROM TESTING OF BALE NO. 1309

Sample Ref.	HVI 3000 Instrument Readings								McBeth Colorimeter			
	Strength (g/tex)	Elongation	UHM Length (in)	Uniformity Ratio (%)	Micronaire	Leaf Index	Gray	Color	Yellowness Index	x	y	z
6/11/82	25.50	5.60	0.953	76.5	3.70	30	31.3	33.8	21.06	69.9	71.2	70.2
6/28/82	24.50	5.70	0.985	77.75	3.55	30	33.0	29.3	21.05	69.9	71.3	70.3
7/9/82	23.75	5.55	0.955	76.75	3.70	30	31.3	31.5	20.60	70.2	71.6	70.9
7/23/82	22.50	5.60	0.980	77.75	3.60	30	30.5	31.5	20.59	70.0	71.3	70.6
8/10/82	23.75	5.95	0.988	79.25	3.65	30	33.0	31.0	20.98	70.3	71.7	70.7
8/23/82	22.50	6.20	0.995	79.50	3.60	30	29.8	33.3	20.81	70.6	72.0	71.1
9/6/82	22.00	6.55	0.983	79.00	3.65	35	35.0	32.0	20.91	70.6	72.0	71.0
9/20/82	23.75	6.90	0.990	79.00	3.60	30	24.0	38.5	20.89	70.6	72.0	71.1
10/18/82	24.75	6.05	1.003	80.00	3.65	30			20.45	71.1	72.4	71.8
11/12/82	24.75	5.95	0.988	80.00	3.60	30	3.15	32.0	20.95	70.4	71.8	70.9
12/10/82	25.25	6.80	1.000	78.75	3.60	30	33.5	32.0	20.38	69.5	70.8	70.3
1/11/83	22.25	7.03	0.988	79.75	3.65	30	30.3	33.3	21.10	69.1	70.4	69.4
2/16/83	24.75	6.83	1.013	81.00	3.70	30	43.5	30.8	21.23	70.1	71.4	70.3
3/11/83	24.00	5.80	0.988	80.00	3.65	10	23.0	38.5	20.54	70.3	71.7	71.0
4/7/83	23.25	5.68	0.893	79.25	3.75	15	26.3	34.0	21.14	70.4	71.8	70.7
5/11/83	23.75	7.48	1.008	80.25	3.60	20	33.0	38.8	20.00	69.9	71.2	71.0
4/5/84	22.75	5.93	1.000	80.50	3.75	20	24.5	40.0	21.03	70.3	71.8	70.7
4/18/84	23.25	6.13	0.975	79.75	3.65	20	29.0	41.0	21.25	70.1	71.4	70.3
4/23/84	23.75	5.98	0.995	80.25	3.65	20	29.3	35.0	21.73	69.4	70.7	69.3

TABLE II
RESULTS FROM TESTING OF BALE NO. 1310

Sample Ref.	HVI 3000 Instrument Readings								McBeth Colorimeter			
	Strength (g/tex)	Elongation	UHM Length (in)	Uniformity Ratio (%)	Micronaire	Leaf Index	Gray	Color	Yellowness Index	x	y	z
6/11/82	24.50	6.83	0.988	76.25	3.30	40	30.3	27.5	20.48	71.0	72.3	71.7
6/28/82	24.00	6.05	1.030	77.00	3.30	40	35.0	34.0	20.62	70.7	72.0	71.3
7/9/82	23.75	5.95	0.980	77.50	3.25	40	30.0	33.0	20.32	70.4	71.7	71.3
7/23/82	22.00	5.95	0.990	76.00	3.25	40	28.3	32.3	20.93	71.2	72.6	71.7
8/10/82	22.75	6.23	1.010	78.50	3.35	30	33.0	36.3	21.01	70.7	72.1	71.1
8/23/82	23.00	6.48	0.998	78.75	3.30	30	32.0	32.3	21.59	70.0	71.4	70.0
9/6/82	23.25	5.98	1.060	79.75	3.10	50	42.8	30.3	20.48	70.1	71.6	70.9
9/20/82	23.25	5.53	1.068	78.00	3.10	30	34.5	39.3	20.47	69.9	71.3	70.6
10/18/82	23.75	6.48	1.015	79.00	3.30	32			20.47	71.8	73.2	72.6
11/12/82	23.75	6.15	1.033	78.75	3.25	30	29.5	32.5	20.42	71.1	72.5	71.9
12/10/82	24.00	7.25	0.985	81.00	3.30	30	31.5	32.5	20.71	71.1	72.4	71.7
1/11/83	23.25	6.98	0.995	79.00	3.30	30	30.8	31.8	20.54	70.4	71.8	71.1
2/16/83	25.00	7.00	1.025	80.75	3.35	30	40.5	31.0	21.27	71.0	72.3	71.2
3/11/83	23.25	6.15	1.028	80.25	3.35	15	18.0	37.0	21.14	71.1	72.4	71.4
4/7/83	24.25	6.18	1.013	79.25	3.35	25	22.0	35.0	21.61	70.6	72.0	70.6
5/11/83	22.25	7.43	1.030	78.25	3.35	30	27.0	40.3	20.23	70.1	71.4	71.0
4/5/84	23.75	6.35	1.015	80.00	3.35	20	27.5	34.3	21.20	71.8	73.2	72.0
4/18/84	24.75	6.48	1.018	79.00	3.35	25	26.3	40.8	21.63	71.0	72.4	71.0
4/23/84	23.25	6.40	0.990	79.25	3.40	20	28.5	43.0	21.82	70.2	71.6	70.1

TABLE III
RESULTS FROM TESTING OF BALE NO. 1311

Sample Ref.	HVI 3000 Instrument Readings								McBeth Colorimeter			
	Strength (g/tex)	Elongation	UHM Length (in)	Uniformity Ratio (%)	Micronaire	Leaf Index	Gray	Color	Yellowness Index	x	y	z
6/11/82	24.75	5.15	1.023	79.25	4.05	50	33.5	26.3	19.99	71.4	72.9	72.4
6/28/82	26.50	5.03	1.068	81.75	4.00	30	32.0	35.8	20.44	71.1	72.6	71.8
7/9/82	27.25	5.10	1.038	80.00	4.00	40	36.5	27.8	19.95	70.9	72.3	72.0
7/23/82	24.50	5.05	1.030	80.75	4.05	40	34.0	29.3	20.28	70.9	72.4	71.8
8/10/82	28.00	5.33	1.023	80.50	4.15	30	32.8	32.0	20.06	70.5	71.9	71.5
8/23/82	25.50	5.73	1.048	81.75	4.10	40	33.8	28.0	20.43	70.2	71.7	71.0
9/6/82	25.00	5.88	1.050	81.75	4.10	50	34.3	29.8	20.41	70.1	71.6	70.9
9/20/82	25.00	5.40	1.060	81.25	4.00	30	27.8	35.5	20.05	70.5	71.9	71.5
10/18/82	27.00	5.43	1.050	81.75	4.00	50			20.55	70.7	72.2	71.4
11/12/82	26.50	5.40	1.065	81.50	3.95	40	34.3	30.8	20.55	69.8	71.2	70.5
12/10/82	25.50	6.08	1.035	82.00	4.15	40	37.0	28.3	20.48	70.2	71.6	70.9
1/11/83	26.50	6.75	1.035	82.50	4.10	30	33.0	30.5	20.06	69.3	70.6	70.3
2/16/83	23.25	7.30	1.023	81.50	3.35	40	42.8	28.5	[20.95	71.0	72.3	71.4]
3/11/83	26.25	4.93	1.048	83.00	4.05	30*	26.5	33.5	20.94	70.8	72.3	71.3
4/7/83	23.25	5.30	1.058	82.25	4.10	20	24.3	34.3	20.72	70.1	71.6	70.7
5/11/83	23.00	6.83	1.045	82.25	4.10	40	29.0	43.8	20.43	70.0	71.4	70.8
4/5/84	24.75	5.45	1.063	81.75	4.05	35	26.5	40.0	21.19	71.0	72.5	71.2
4/18/84	24.75	5.40	1.053	82.75	4.00	30	27.5	37.3	21.12	70.5	72.0	70.8
4/23/84	24.75	5.53	1.045	82.50	4.10	35	27.0	34.0	21.12	70.2	71.7	70.5

TABLE IV
RESULTS FROM TESTING OF BALE NO. 1312

Sample Ref.	HVI 3000 Instrument Readings								McBeth Colorimeter			
	Strength (g/tex)	Elongation	UHM Length (in)	Uniformity Ratio (%)	Micronaire	Leaf Index	Gray	Color	Yellowness Index	x	y	z
6/11/82	25.5	5.33	1.043	76.00	3.10	50	38.8	26.5	20.34	69.2	70.6	70.0
6/28/82	26.0	5.40	1.030	77.25	3.00	50	37.3	32.3	21.26	69.1	70.5	69.3
7/9/82	24.0	5.08	1.058	76.00	3.05	50	40.5	29.5	19.80	69.6	71.0	70.8
7/23/82	23.25	5.20	1.048	77.00	3.10	30	40.3	34.0	20.13	69.9	71.2	70.9
8/10/82	23.75	5.45	1.068	78.75	3.15	30	41.8	32.8	20.42	70.1	71.5	70.8
8/23/82	24.5	5.73	1.060	78.00	3.10	40	42.8	31.0	20.93	69.4	70.8	69.9
9/6/82									20.56	71.1	72.5	71.8
9/20/82									21.68	70.9	72.3	70.8
10/18/82	24.75	5.55	1.075	79.75	3.10	30			20.28	69.7	71.0	70.5
11/12/82	25.25	5.48	1.070	80.25	3.05	50	39.3	32.3	21.16	69.9	71.2	70.1
12/10/82	25.25	6.05	1.065	79.75	3.10	30	38.3	33.5	21.36	68.3	69.6	68.4
1/11/83	23.50	6.70	1.055	79.00	3.15	30	37.0	33.8	20.51	67.4	68.7	68.1
2/16/83	24.75	5.85	1.095	80.50	3.10	50	56.0	27.5	20.93	68.6	69.9	69.0
3/11/83	24.75	4.95	1.080	80.25	3.05	30*	32.3	34.3	20.88	69.9	71.2	70.3
4/7/83	23.25	5.50	1.073	79.25	3.00	25	37.5	34.8	21.55	69.5	70.9	69.5
5/11/83	23.75	6.45	1.090	79.25	3.15	30	32.3	44.5	20.26	67.9	69.2	68.8
4/5/84	24.00	5.48	1.068	79.75	3.15	30	31.5	35.5	20.77	70.2	71.7	70.8
4/18/84	24.75	5.43	1.053	79.75	3.15	40	32.3	35.0	21.33	67.7	69.1	67.9
4/23/84	24.50	5.63	1.080	79.00	3.25	25	32.5	36.5	21.56	68.9	70.2	68.9

TABLE V
RESULTS FROM TESTING OF BALE NO. 1313

Sample Ref.	HVI 3000 Instrument Readings								McBeth Colorimeter			
	Strength (g/tex)	Elongation	UHM Length (in)	Uniformity Ratio (%)	Micronaire	Leaf Index	Gray	Color	Yellowness Index	x	y	z
6/11/82	26.50	5.63	1.050	78.00	3.55	50	37.8	28.8	20.73	68.4	69.7	68.9
6/28/82	26.75	5.85	1.045	78.75	3.35	50	36.5	31.3	20.37	69.0	70.4	69.8
7/9/82	26.25	5.48	1.035	78.75	3.40	50	39.5	32.5	20.28	69.3	70.7	70.2
7/23/82	25.50	5.45	1.0375	77.25	3.35	40	37.0	33.8	20.70	68.4	69.8	69.0
8/10/82	25.25	5.90	1.0525	79.25	3.55	35	41.8	32.3	21.61	68.8	70.2	68.7
8/23/82	25.25	6.20	1.0625	80.75	3.40	40	38.3	34.8	21.77	68.8	70.3	68.7
9/6/82	26.25	6.28	1.070	79.00	3.40	50	39.3	33.3	21.42	69.1	70.5	69.2
9/20/82	25.25	5.93	1.058	79.25	3.35	30	32.0	41.8	21.06	68.2	69.5	68.5
10/18/82	26.25	5.80	1.083	80.50	3.45	40			21.14	69.3	70.7	69.6
11/12/82	25.50	5.75	1.083	80.75	3.55	60	37.3	34.8	21.17	67.8	69.2	68.0
12/10/82	25.75	6.43	1.0775	80.50	3.40	50	40.0	32.5	20.35	68.9	70.2	69.7
1/11/83	25.50	6.73	1.0675	80.50	3.35	50	38.3	36.0	21.17	68.4	69.8	68.6
2/16/83	27.75	6.93	1.085	80.50	3.40	50	48.8	32.8	21.16	68.9	70.2	69.2
3/11/83	25.75	5.45	1.080	80.50	3.40	25*	31.5	38.8	21.46	67.6	70.0	67.7
4/7/83	25.25	6.15	1.080	80.50	3.45	35	35.0	35.5	21.21	68.8	70.3	69.0
5/11/83	24.25	6.98	1.098	81.00	3.50	40	32.5	37.3	20.74	67.4	68.7	68.0
4/5/84	25.50	5.98	1.068	80.75	3.45	30	30.3	33.8	21.88	68.9	70.3	68.8
4/18/84	27.00	5.73	1.068	81.00	3.50	25	32.0	41.5	22.40	67.7	69.0	67.1
4/23/84	25.25	6.03	1.058	80.00	3.55	40	34.8	35.3	22.16	67.3	68.7	67.0

TABLE VI
RESULTS FROM TESTING OF BALE NO. 1314

Sample Ref.	HVI 3000 Instrument Readings								McBeth Colorimeter			
	Strength (g/tex)	Elongation	UHM Length (in)	Uniformity Ratio (%)	Micronaire	Leaf Index	Gray	Color	Yellowness Index	x	y	z
6/11/82	23.75	5.55	1.0125	78.00	3.30	30	28.8	36.5	22.85	70.7	72.1	69.8
6/28/82	24.00	5.88	1.010	78.25	3.30	40	30.0	42.0	22.08	70.6	71.9	70.2
7/9/82	24.00	5.63	1.058	79.50	3.30	40	26.3	42.8	24.57	69.3	70.6	67.3
7/23/82	23.25	5.65	1.043	79.00	3.30	40	25.5	42.3	23.42	70.0	71.4	68.3
8/10/82	24.50	5.75	1.055	80.25	3.25	30	21.5	47.0	24.89	69.2	70.5	67.1
8/23/82	24.25	6.30	1.080	81.25	3.30	30	25.8	48.0	24.50	69.9	71.3	68.0
9/6/82	24.00	6.30	1.048	80.50	3.40	50	31.5	42.0	23.50	70.1	71.4	68.8
9/20/82	24.25	6.10	1.038	79.80	3.35	20	2.35	45.8	24.88	69.7	71.0	67.5
10/18/82	25.00	6.10	1.060	81.25	3.40	40			23.99	69.7	71.0	68.1
11/12/82	24.25	6.15	1.063	81.25	3.40	35	24.8	46.3	24.81	69.8	71.1	67.6
12/10/82	24.25	6.88	1.048	82.00	3.25	30	26.0	46.5	25.04	68.3	69.5	66.1
1/11/83	22.00	7.08	1.070	82.25	3.25	30	26.5	44.3	24.46	69.0	70.3	67.1
2/16/83	24.50	6.98	1.090	82.25	3.40	40	36.5	46.8	25.61	68.1	69.2	65.5
3/11/83	23.25	6.05	1.038	81.25	3.40	30*	24.5	46.3	25.58	68.4	69.5	65.8
4/7/83	23.25	6.18	1.085	79.50	3.35	30	24.3	47.0	24.70	69.0	70.3	67.0
5/11/83	23.00	7.20	1.080	81.50	3.40	30	26.5	50.0	25.09	68.0	69.1	65.7
4/5/84	22.25	6.03	1.050	81.50	3.30	55	25.0	54.3	25.88	68.0	69.2	65.2
4/18/84	23.75	6.28	1.043	80.80	3.40	20	17.8	50.8	25.42	69.0	70.3	66.5
4/23/84	22.75	6.20	1.025	81.75	3.45	20	18.0	48.8	25.06	68.2	69.5	66.0

VISITORS An Intensive Short Course in Textiles was conducted at the Textile Research Center July 9 through 11 for personnel of Johnson & Johnson, Sherman, TX. Those receiving certificates upon completion of the course were John M. Agostini, Michele Pavlyak, Pamela Williams, John Soule, Greg Whiting, Robert Brady, Ed Mills and Gene Johnson. Instructors for the sessions were Robert G. Steadman, Richard N. Combs, Cecile Ingram, James Lambert, Edwin Foster and Reva E. Whitt of the Textile Research Center staff.

Other visitors to the Center during July included 25 Texas State Future Farmers of America officers who were in Lubbock for the State FFA Convention, and a group of participants in an Agricultural Economics short course who came from Pakistan, Central America and various African countries. Also visiting were Michele Woodruff, Cotton Incorporated, Raleigh, NC; and Takao Konishi, Inter-Tec Co., Ltd., Osaka, Japan.