TRC

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BLENDS OF WOOL ON THE COTTON SYSTEM From time to time, we have reported on various programs involving blends of cotton and wool in yarns produced on the cotton system. Because this is a procedure used by a number of textile companies today, our reports have mostly concerned some aspect different from the normal procedure of yarn manufacturing. In the October 1984 issue of *Textile Topics* we gave information on blending cotton with wool of different lengths. These were 1 inch, 1¼ and 1½ inches, and the blend with cotton contained 40% wool. At a later date, July 1985, we reported on the use of 10% and 20% wool with cotton to spin an N_e 6 yarn for filling in the production of a 14½ ounce denim. Both of these programs were interesting, and the one reported in October 1984 gave considerable detail of using wool shorn from the sheep when the fiber was of suitable length for use on the cotton system.

Our most recent research on cotton/wool blends has once again utilized wool taken directly from the sheep. To relate this to our earlier work, we quote from the October 1984 report as follows:

> "As the cotton system of yarn manufacturing is designed for fibers 1½ inches in length and shorter, wool processed on this system must be short enough to pass through the various machines without causing difficulty. We have learned that a small percentage of fiber longer than 1½ inches does not seem to cause a serious problem, but processing is enhanced when excessively long fibers are kept to a minimum. Past research has shown that combed worsted top cut to 1½ inches is highly suitable for the cotton system when blended with cotton or other fibers. Some manufacturers prefer to have the wool stretch broken, which is reported to be satisfactory, also. There is one other way to obtain short wool, and this is by clipping it from the sheep before the fiber length becomes too long for the cotton system. This has been found to be a spinnable material, particularly when blended with another fiber and if the percentage of wool is not too high. However, this type of wool has a higher variation in length than cut wool. Since some Texas producers shear their sheep twice a year, there is a significant amount of this wool available in this area. The Textile Research Center has evaluated the utilization of this fiber on several occasions, and the project we are reporting here was conducted with the short-clipped wool.
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> "The schedule for twice-a-year shearing is usually in April and then again in August or September. This is done because of environmental conditions in some locations and to maintain animal vigor. Scientists at Texas A&M University have found, additionally, that the ewes are more productive when their wool is kept short. We learned at one meeting that shearing the female sheep twice each year, on a seven month/five month basis or every six months, increases lamb production by some 6 to 8 percent. On another occasion, we listened to a report by a rancher whose goal was a 200% lamb production each year. He stated at the time of his report that his production was up to 148%. He was accomplishing this by building a flock of ewes that gave birth to twins and by shearing twice a year.
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> ". . . We have noted in past research that the CV of the length of cut combed top is considerably [better] than that [of short-shorn wool]. Even so, we found this program quite interesting and have concluded that the short-shorn wool can be used in the production of yarns on the cotton system. We recommend, however that this be blended with some other fiber."

As we mentioned in 1984, there was a problem with the wool that was shorn at approximately 1½ inches. This came from attempting to use all the fiber, including the short fiber coming from the legs, belly area and neck. This resulted in a rather high degree of length irregularity, and subsequently affected spinning performance and yarn quality. Very recently, some Texas ranchers have been "skirting"

the fleeces at shearing to remove a good portion of the short and dirty fiber. Skirting is a process of manually separating the leg, belly and neck fiber (which is shorter and less desirable), leaving only the longer and cleaner fiber taken from the sides, back and shoulders of the sheep. This gives a wool with improved quality and better length uniformity. Our current program was designed to compare the skirted short wool with cut worsted top. Both wools were used in 80% cotton/20% wool blends. The Texas short wool was graded as 64's with an upper-half-mean length of 1½ inches. The cut top was also 64's and 1½ inches.

The following table compares yarns spun using both wools and gives spinning details and yarn quality measurements. It will be noted that two cottons were used in this study. The first came from the El Paso area of Texas and was highly suitable for blending with wool. It had a micronaire of 3.9 and a length of 1.19 inches. We realized it commands a higher price than upland cottons, and it was decided to try a shorter and less expensive cotton to see what the effect might be. Therefore, the second part of the project used a 3.3 micronaire cotton that was 1.14 inches in length. This was an upland cotton produced in the Lubbock area.

COTTON FIBER PROPERTIES					
Micronaire	3.9			3.3	
Length (in)	1.19			1.14	
Uniformity Ratio (%)	82			80	
Strength (g/tex)	28			29	
Elongation (%)	5.6			5.7	
YARN PROPERTIES FOR 80% COTTON/20% WOOL BLENDS					
	Intimate Blend		Drawing Frame Blend	Intimate Blend	
Wool Used	Cut Worsted	Texas Short Shorn	Texas Short Shorn	Cut Worsted	Texas Short Shorn
Roving Size	2.00/2	2.00/2	1.50/2	1.50/2	1.50/2
Yarn Number (N_e)	16.15	16.05	15.85	15.76	15.96
Twist Multiplier	3.7	3.7	3.6	3.7	3.7
Skein Strength (lbs)	128.8	126.6	133.6	129.9	128.4
Corrected Break Factor	2083	2034	2114	2043	2048
Uster CV%	20.32	21.74	17.68	17.58	18.32
Thin Places/1,000 yds	285	402	35	45	74
Thick Places/1,000 yds	535	742	375	433	587
Neps/1,000 yds	258	266	159	151	154
Hair Count/100 yds	2084	1304	1029	2152	1727
Single-end Strength (g)	515	522	477	489	508
Tenacity (g/tex)	14.10	14.19	12.94	13.05	13.72
Elongation (%)	5.40	5.65	6.73	5.70	6.10
Yarn Grade	C+	C	B+	C	D

Four of the five yarns spun came from intimate blending at our opening and cleaning machinery. The fifth yarn was a drawing frame blend, produced only for comparison with the others. This blend and two of the others utilized the longer El Paso cotton. All processing was carried out with TRC's high-speed Hollingsworth cards, two processes of drawing, roving, and ring spinning. It will be seen that for the intimate blended yarns produced with the El Paso cotton, a 2.0 hank roving was used and double-creeled at ring spinning. For the remaining blends, a 1.5 roving was used with two strands also being fed at spinning.

The yarn number produced in each case was N_e 16. The twist inserted in the yarns was virtually the same. It was found that the 1.5 hank roving produced a more even yarn with the Uster CV% being lower than when the 2.0 roving was used. Yarn break factor (count-strength-product) was approximately the same in every case, with the drawing frame blend showing slightly greater strength. However, the tenacity expressed in grams/tex was stronger for the yarns produced from the El Paso cotton than from the upland cotton. It is interesting to note that while the drawing frame blend resulted in a higher break factor, it had the lowest tenacity, although this was not greatly different from the yarns using the upland cotton.

All in all, we have found the Texas short wool, after skirting, to perform remarkably well. From the beginning of processing, we compared this wool with that used in previous research, and we noticed that the better quality fiber and more uniform length in the skirted wool had a beneficial effect on spinning performance and yarn quality. This seems to hold considerable promise, especially since it sells for a lower price than cut worsted top.

This research is continuing, and plans are to study the utilization of Texas short, skirted wool in additional blends with cotton and other fibers. The Natural Fibers & Food Protein Commission of Texas is sponsoring this program. The processing and spinning are supervised at TRC by Edwin R. Foster, with assistance from Felix Torres, Mack Holcombe and Ramon Ortiz.

EGYPTIAN GROUP VISITS TRC Eight cotton and textile industry executives from Egypt toured the Textile Research Center recently as part of a program sponsored by Cotton Council International. This was designed to inform the Egyptians of the quality and availability of American cotton.

The group included Mostafa A. Elbashbishy, Ministry of Economy and Foreign Trade, Cairo; Yassin Osman, Ministry of Agriculture, Cairo; Ahmed Youssef, Egyptian Cotton Authority, Alexandria; Samir Mostafa, Cotton Research Institute, Giza; A. L. Shawki, Alkahira Cotton Company, Alexandria; Abdel Fattah Abbas Zaki, Societe Misr Pour l'Exportation du Coton, Alexandria; A. Yassin Mahmoud, El Siouf Spinning & Weaving Company, Alexandria; and Galal Daabis, National Spinning & Weaving Company, Alexandria. They were accompanied by Vaughn Jordan, Cotton Council International, Washington, DC and Rick King, National Cotton Council, Slaton, TX.

Harvin Smith, head of TRC's materials evaluation laboratories, demonstrates the Technicon InfraAlyzer 400 to the Egyptian delegation, showing how cotton fiber maturity measurements are made.

Interested Egyptian visitors observe high volume instrument testing as Smith describes the various tests being performed. TRC technicians shown are Rebecca Youngblood (left) and Mae Bibbs.

VISITORS Recent visitors to the Textile Research Center, besides those mentioned in the article above, included Richard C. Wright, Monsanto Polymer Products Co., Akron, OH; Mike Rodriguez, Mission Valley Mills, New Braunfels, TX; Roger Bolick, Allied Plastics & Fibers, Hopewell, VA; Tom Derrick, Allied Corporation, Columbia, SC; and Faron Pfeiffer, Texas A&M Research Center, San Angelo, TX.

Also visiting were Enrique Crouse and Reinder Homan, Hebox Textiles, Ltd., Hammarsdale, South Africa; Marco Rescali and Hadener Emanuele, Rescali Cotoni S.A.S., Milan, Italy; Gianluigi Candiani, Tessitura di Robecchetto Candiani, s.p.a., Robecchetto, Italy; Selim Gole, Pazarlama Ihracat Ithalat a.s., Istanbul, Turkey; and Anton Schenek, Bremer Baumwollborse, Bremen, West Germany.

In addition to these, twenty-five elementary school students from Whiteface, TX came to the Center for an educational tour.