



## EFFECTS OF DRAWING AFTER COMBING (PART 1)

In the January 1991 issue of *Textile Topics* (Volume XIX, No. 5) we made reference to plans for conducting research on combing cotton for rotor spinning. The program we mentioned was delayed due to an unexpected problem in the acquisition of the machinery, but in the meantime we have conducted some preliminary studies.

While there is absolutely nothing new about drawing after combing, a question we have had concerning rotor spinning is whether to use one or two drawing processes. We have been told that with a certain type of drawing machine, only one process is necessary. We intend to learn whether that is really the case.

An objective of our preliminary research was to compare the quality of ring yarns spun from one and two drawing processes after combing. Also, we felt it would be of value to compare the equipment we have used at the International Center for many years with the new that is to be installed soon.

These preliminary studies were sponsored by the Texas Food and Fibers Commission. The full report of this research is included in the 1990-1991 annual progress report to that organization. It is much too extensive to be carried in a single copy of *Textile Topics*, so we plan to offer additional segments in subsequent issues, serial style.

The cotton used in this program was made up of twelve lots grown in California. Each lot was carded into 60-grain sliver at 75 lbs/hour on a Rieter C-4 card. At that point, 1/3 of each lot was taken through two processes of drawing, roving and then to ring spinning. (This carded yarn was to be used for comparison with yarns spun after one and two drawings following combing.) The remaining 2/3 of each lot was drawn one time to 53 grains/yard before being formed into laps for combing.

The comber used was a Whitin Model J7-B. After combing, half of the sliver was drawn one time utilizing a Saco Lowell drawing frame. This was then taken to roving to be prepared for ring spinning. The other half of the sliver was drawn a second time before roving. The sliver size in all cases (that for the carded

yarn and both combed lots) was 55 grains/yard.

The roving process reduced the sliver to 1.8 hanks per pound with a twist multiplier of 1.26. A Saco Lowell SF-3H ring machine was used to spin 50/1 yarn with a twist multiplier of 3.8 at a spindle speed of 11,000 rpm. This machine is equipped with 2-inch rings.

To summarize the processing procedure, each of the twelve lots was divided three ways to give a carded yarn and two combed yarns, one of which received one drawing after combing and the other two drawings.

Figure 1 on the following page graphically presents the strengths expressed as count-strength product for the thirty-six yarns. It will be seen immediately that both combed yarns were significantly stronger than the carded yarn. However, the results coming from this study show there is very little difference in the strengths of the combed yarns spun after one and two drawings. In fact, in five of the twelve lots, the yarn that was made from only one drawing was stronger than that coming from two drawings.

Figure 2 shows the non-uniformity (CV%), or evenness, of the various yarns. Obviously, the carded yarn did not possess the degree of evenness that the two combed yarns did. In every case, the combed yarn produced from two drawings had a lower CV% than that coming from one drawing, although in some cases the difference was very slight.

Table I (page 3) presents yarn testing results including details of strength and evenness measurements. It was from these data that the bar charts were constructed.

This program was supervised at the International Center by John B. Price, assistant director, and William D. Cole, head of our spinning technologies department. Assistance was given by Felix Torres, Danny Rodriguez and Ramon Ortiz.

This report will be continued in next month's *Textile Topics*.

Figure 1: Bar Chart for Count Strength Product (Break Factor)

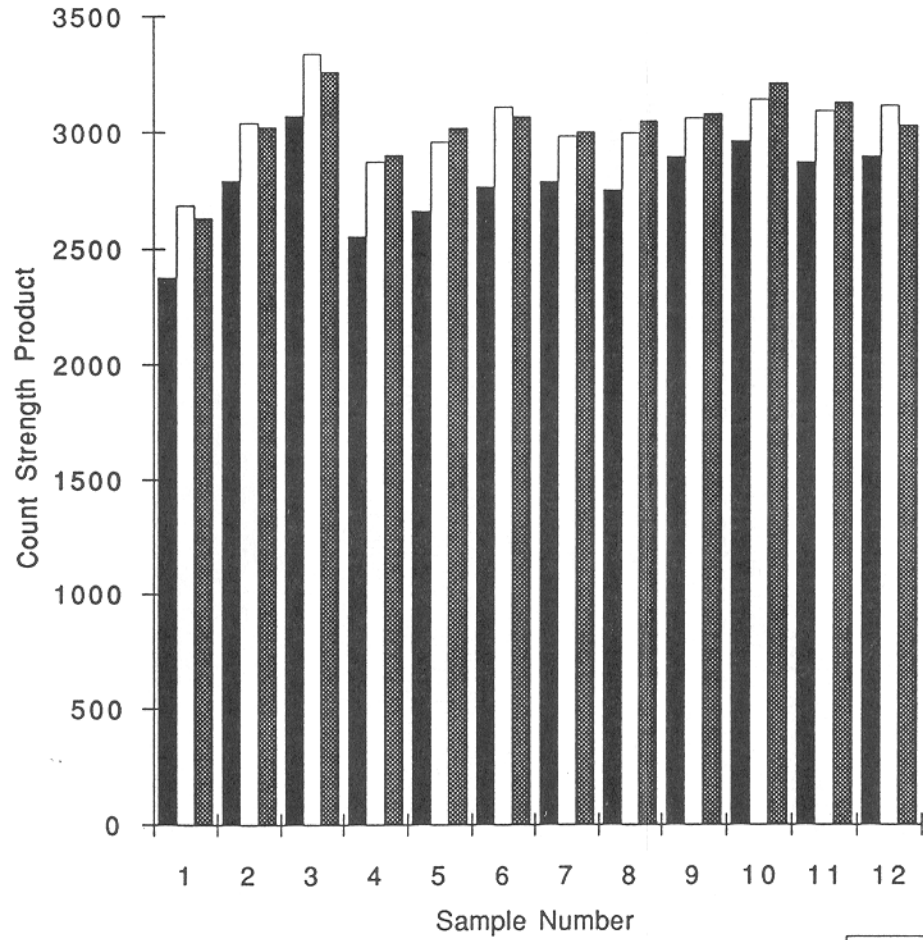


Figure 2: Bar Chart for Evenness

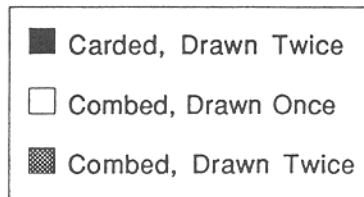
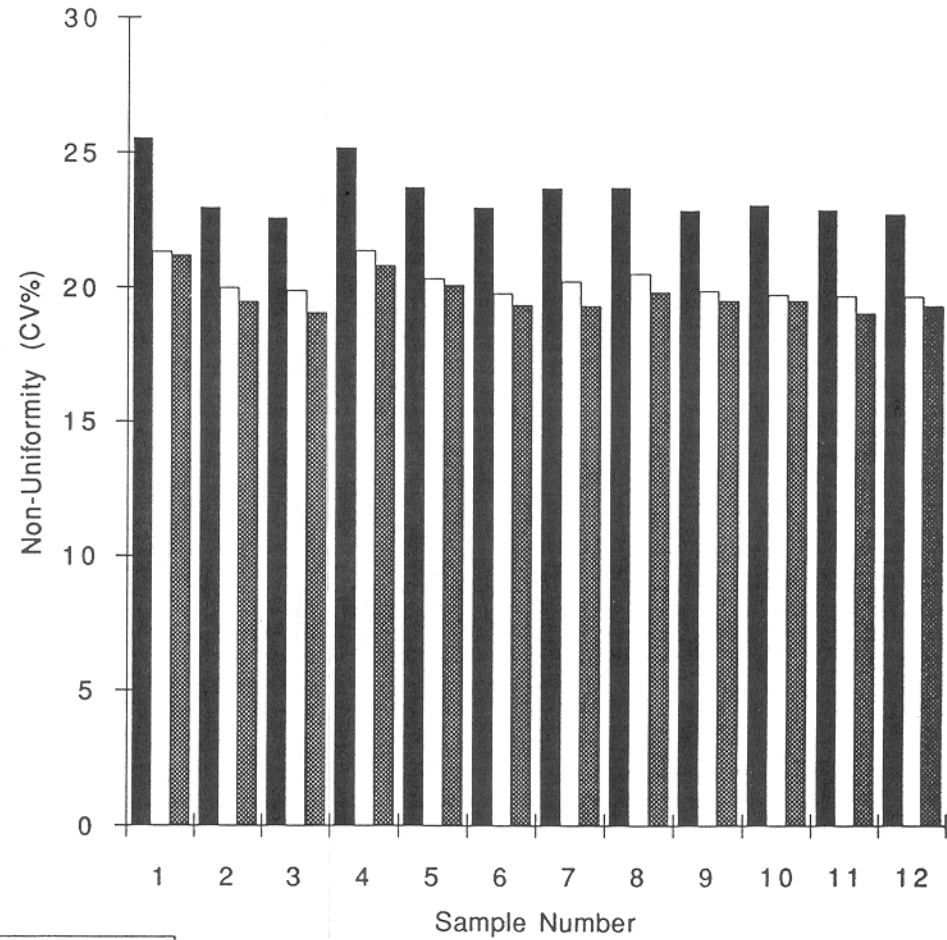


TABLE I

## SKEIN STRENGTH AND EVENNESS DATA

Identification	1	2	3	4	5	6	7	8	9	10	11	12
<b>N<sub>e</sub> 50, CARDED, RING-SPUN</b>												
Actual Yarn Number (N <sub>e</sub> )	49.04	49.55	49.51	50.15	50.68	49.42	50.66	51.11	49.58	48.54	50.51	50.69
Skein Strength (lbs)	48.8	56.5	62.2	50.9	52.3	56.2	54.9	53.5	58.6	61.6	55.3	57.0
Break Factor	2376	2792	3071	2553	2663	2767	2791	2754	2895	2964	2873	2900
Evenness (CV%)	25.56	22.98	22.60	25.20	23.74	22.97	23.70	23.72	22.88	23.08	22.89	22.73
Thin Places/1000 yds	1287	622	433	1116	785	540	710	710	570	566	564	516
Thick places/1000 yds	2330	1646	1647	2275	1852	1721	1829	1903	1682	1702	1724	1638
Neps/1000 yds	1673	1118	1454	1684	1294	1282	1296	1424	1200	1428	1307	1431
Appearance Index	60	70	70	60	70	70	70	60	60	70	70	70
<b>N<sub>e</sub> 50, COMBED, RING-SPUN (Single Passage Drawframe)</b>												
Actual yarn Number (N <sub>e</sub> )	49.61	48.76	51.14	49.45	51.55	50.32	50.55	50.90	51.30	49.48	50.16	51.17
Skein Strength (lbs)	54.3	62.8	64.9	58.3	56.9	61.7	58.9	58.6	59.3	63.7	61.7	60.5
Break Factor	2687	3038	3337	2873	2958	3108	2984	2997	3063	3142	3095	3116
Evenness (CV%)	21.34	20.01	19.90	21.37	20.34	19.77	20.22	20.50	19.86	19.74	19.68	19.66
Thin Places/1000 yds	402	205	169	331	272	181	212	219	193	168	152	166
Thick Places/1000 yds	1159	875	908	1246	938	846	893	894	884	876	870	902
Neps/1000 yds	738	620	851	938	598	693	607	763	656	747	751	749
Appearance Index	70	70	70	70	70	80	70	70	70	70	80	70
<b>N<sub>e</sub> 50, COMBED, RING-SPUN (Double passage Drawframe)</b>												
Actual Yarn Number (N <sub>e</sub> )	50.27	50.68	50.14	50.74	50.60	51.22	50.45	50.56	50.49	51.15	50.55	51.30
Skein Strength (lbs)	52.3	59.4	65.0	57.0	59.5	59.5	59.4	60.1	60.9	62.4	61.8	58.7
Break Factor	2631	3022	3261	2903	3019	3069	3002	3049	3081	3212	3131	3032
Evenness (CV%)	21.21	19.49	19.07	20.81	10.20	19.35	19.32	19.83	19.52	19.52	19.03	19.30
Thin Places/1000 yds	374	214	128	336	271	164	185	231	171	161	146	168
Thick Places/1000 yds	1200	784	789	1122	950	828	783	910	845	872	768	815
Neps/1000 yds	702	560	666	815	606	608	576	750	574	686	632	675
Appearance Index	70	80	70	70	70	80	90	70	80	70	90	80

**NEW TWISTER INSTALLED**

In last month's *Textile Topics* we announced the purchase of a new Volkmann VTS-05 two-for-one twister from Saurer Textile Systems of Charlotte, NC. We are pleased to announce that the machine is now installed and operating at the International Center.

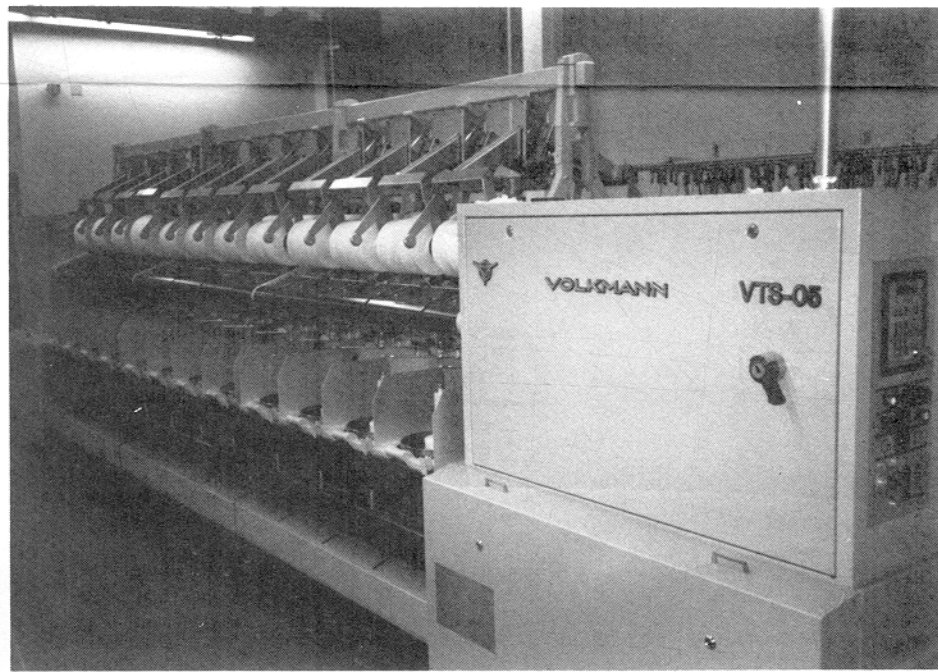
This 24-spindle machine (shown in the photo below) is designed primarily for plying coarse yarns. Plans are to use it in our research on nylon carpet yarns, yarns produced from other man-made fibers

and in our wool and mohair projects for several state agencies.

Early experiments with the twister indicate it will be useful in expanding our research. For some time we have been utilizing a ring twister and another Volkmann two-for-one machine, but these have not been sufficient to keep up with the demand for plied yarn programs. Obviously, the new twister will increase our capability for conducting such projects.

We had hardly announced the acquisition of the Volkmann VTS-05 when we were awarded a new project which necessitated its utilization. This exemplifies a philosophy we have had for many years: A research center such as ours must have the proper equipment before it can attract research sponsors.

We are very pleased to have this machine installed so quickly. We want to express our appreciation to Saurer Textile Systems for arranging prompt shipment and helping us get the machine in operation.



## VISITORS

Visitors to the Center during September included Chessley B. Howard and Robert J. Fisher, Graniteville Co., Graniteville, SC; Roger Bolick, Allied Fibers, Hopewell, VA; Rick A. Countryman, Henkel Corporation, Charlotte, NC; Paul Muncrief, Cotton Unlimited, Post, TX; Kamal El-Zik and Peggy Thaxton, Texas A&M University, College Station, TX; Hanaa Farid Fahmy, Cotton Research Institute, Giza, Egypt; and Juan Carlos Gutierrez M., Centro de Investigacion y Desarrollo Agraria, Seville, Spain.

Other visitors, all from Turkey, were Gulden Yazan and Ahmet Usturali, Ege Tarimsal Arastirma Enstiton, Izmir; Savas Yazan, Aliaga; Sundus Uzun, Zirai Mucadele Arastirma Enstiton, Izmir; Hac Mehmet, South-

eastern Aretolvey Agricultural Research Institute, Bakir; Cumhar Gulag, Painak Arastirma Enstiton, Nazilli; Qurel Aydin, Nazilli Cotton Research Institute, Nazilli; and Onal Inan, Bolge Pamut Arastirma, Antalya. The group was accompanied by Euel Stockard, Texas A&M University, College Station, TX. On September 27 Nicolae Haralampie Costin, Victor Vladimir Albina and Mihai Titean, from Moldavia, USSR, came to the Center.

Local visitors included sixteen students from Hale Center High School, Hale Center, TX; and a class of 45 Agricultural Economics students from Texas Tech University.