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DEVELOPMENT OF A PROCEDURE FOR DYEING NEPS

One of the most significant programs we have undertaken in many years has led to a procedure for dyeing cotton fabrics containing neps formed by immature and dead fibers. This procedure results in an even, well-dyed fabric with neps thoroughly covered.

This research has been underway since early 1988, but we have not mentioned it previously because we wanted to be fairly sure the procedure has practical application. (We realize there is a vast difference between a research laboratory and an industrial operation.) We have discussed this with only a few companies that have expressed willingness to cooperate with us to determine the practicality of our nep dyeing method. We have asked these friends to evaluate what we are doing and tell us if it has merit, if it is practical, whether it is applicable for industrial use, or is worthless. We have not yet received full response but we expect to have this before long.

In any event, we feel we are far enough along with this to mention that we have extensively researched nep dyeing, and we have found it can be done. In fact, it appears it can be done with a reduction in the amount of dye used. We are still not sure, however, what the overall cost may be. Our expenses in research probably have little similarity to those experienced by a large finishing plant, but at this point we do not see that additional costs would be prohibitive.

Besides assisting industry, we have another motive for conducting this research. Farmers in Texas and other locations often have to take discounted prices for their cotton because some of it is below the 3.5 micronaire level. The United States Department of Agriculture classing system mandates that cotton with micronaire readings above 4.9 and below 3.5 are to be sold at discounted prices. Most of the discounts are applied for measurements below 3.5, and the lower the micronaire, the lower the price. The reasoning behind this is that low micronaire fibers are generally immature (in American upland cottons) and do not have a value equal to those that are mature. Also, immature cotton is associated with neps that do not take dye at the same level as mature cotton. The end result of this is that these neps are evident as white specks in a dyed fabric, particularly in dark shades.

We realize, of course, that developing a method for dyeing neps might simply serve to make low micronaire cotton more attractive to industry. If neps can be dyed and no longer give a fabric inferior in appearance, then why not buy more low micronaire cotton at the discounted price? Conversely, if neps can be dyed and no longer lead to inferior fabrics, why not remove the discounts entirely? If the problem should cease to exist, then why should the discount that was intended to compensate for it continue to exist?

Of the 4.7 million bales of cotton produced in Texas in 1987, almost 30% was discounted because of low micronaire. With an average discount of $20 per bale, the total loss to Texas farmers was approximately $27 million. This certainly does not help when the income from cotton is already at a point where some farmers are considering other uses for their land.

Our research on dyeing neps involved the formation of four filling-faced fabrics, each constructed with a different micronaire level in the filling yarn. The micronaires were 2.6, 3.4, 3.9 and 4.6. The four fabrics were dyed in exactly the same manner with the same dye concentration (Reactive Blue 19, 5.0% concentration). It was interesting to note that when using the yarn made from the 2.6 micronaire cotton, the shade of the fabric was noticeably lighter, with numerous neps visible on the surface. The fabric produced from the 4.6 micronaire yarn had a much deeper shade with very few neps visible. The table on the next page lists other dyes used in this study. We mention Reactive Blue 19 because it was used in a test to match the dyeing of a fabric received from industry.

The next step in the program was to dye the same four fabrics after they had been given a special

treatment. The dyeing was carried out in exactly the same manner as that given the control fabrics. The end result of this was dramatic. The pre-treated fabric prepared from the 2.6 micronaire filling was equal in shade to the control made from the 4.6 micronaire cotton, and no neps were apparent.

Just as the four control fabrics dyed deeper in shade as the micronaire level increased, so did the fabrics that were treated prior to dyeing. However, the dye up-take after treatment was much greater, the colors deeper, and no neps were visible in any of the fabrics, regardless of micronaire level. It seems, therefore, that after the special treatment, fabrics may be dyed with reduced dye concentration.

Fabric Number	Fabric Treatment	Dye Used	Percent Dye Concentration	Washfastness Rating[1]		Lightfastness Rating[2]
				Alteration	Staining	
1	Untreated	Direct Blue 80	0.5	3.0	3.5	5.0
2	Treated	Direct Blue 80	0.5	1.5	3.0	3.5
3	Treated	Direct Blue 80	0.25	3.0	4.0	3.5
4	Untreated	Direct Blue 218	1.0	3.5	4.5	4.5
5	Treated	Direct Blue 218	1.0	3.0	3.5	4.0
6	Untreated	Reactive Blue 184	2.0	5.0	5.0	3.5
7	Treated	Reactive Blue 184	2.0	5.0	5.0	2.0
8	Untreated	Reactive Blue 52	2.0	5.0	5.0	4.5
9	Treated	Reactive Blue 52	2.0	5.0	5.0	4.0

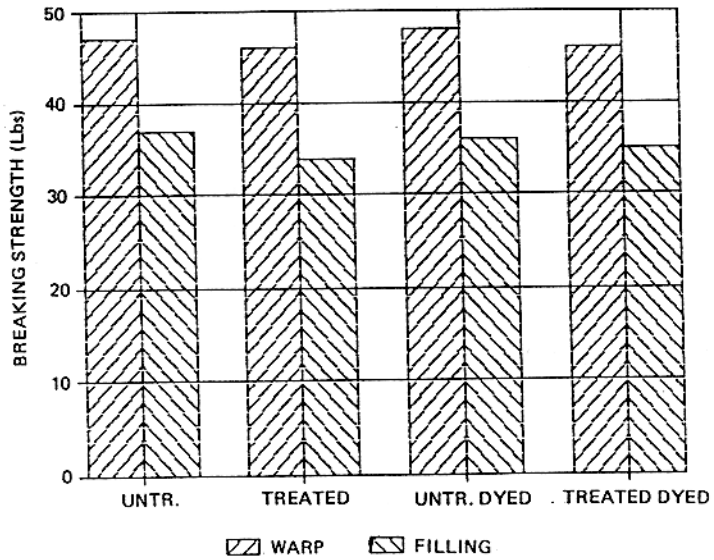
1 = AATCC Wash Test IIA
2 = AATCC Light Test, 20 Standard Fadeometer Hours, Xenon Arc

In addition, the treatment has been shown to have no detrimental influence on fabric characteristics such as tensile strength, flex abrasion and wrinkle recovery. The data presented in the accompanying graphs show that very little change in tensile strength occurs with the treatment, yet improvements in flex abrasion and wrinkle recovery are immediately apparent.

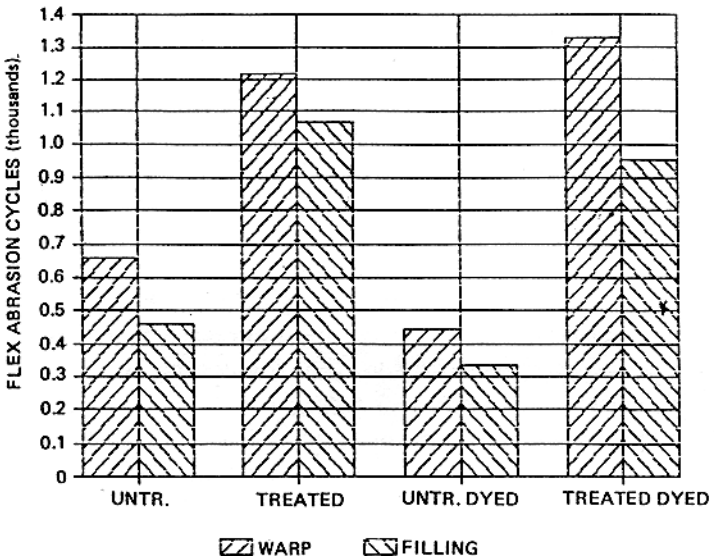
As we suggested earlier, we normally would not report on a research program or the results coming from it until we are satisfied a publication should be made, but in this case we are requesting industry's evaluation of our research. If this proves practical for use in industrial finishing plants, we will publish details as soon as possible. If, on the other hand, we are told the procedure is not practical, we will publish that also and get on with something of more value to our friends in cotton production and manufacturing.

This research which has established a procedure for treating and then dyeing fabrics to cover neps was conducted by Dr. R. D. Mehta, manager of chemical finishes research at the International Center for Textile Research and Development. We appreciate the effort he has given this program.

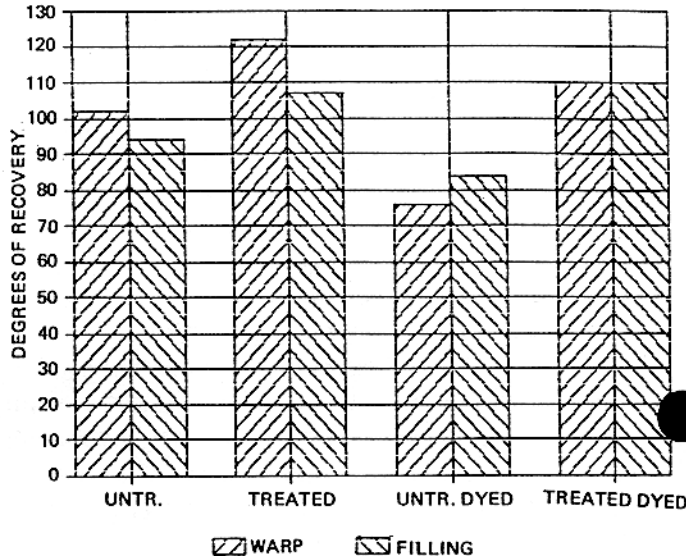
BREAKING STRENGTH OF TREATED AND UNTREATED COTTON BEFORE AND AFTER DYEING



FLEX ABRASION CYCLES OF TREATED AND UNTREATED COTTON BEFORE AND AFTER DYEING



DRY WRINKLE RECOVERY OF TREATED AND UNTREATED COTTON BEFORE AND AFTER DYEING



TEXTILE EDUCATION AT TEXAS TECH

The academic program in Textiles at Texas Tech University has recently taken a new direction. Response to inquiries made to the U. S. textile industry led to a decision to change the curriculum offered here in Textile Technology and Management to include more emphasis on business administration and less on some aspects of engineering. Information received from industry executives indicated that textile graduates need more knowledge in management, accounting, corporate finance, and marketing, particularly international marketing.

With this information at hand, a specially appointed committee has designed a new curriculum that incorporates industry's recommendations. This will include more courses in the College of Business Administration, some classes in the College of Agricultural Sciences, and upgrade education in textile technology. The textile courses will be presented by the staff of the International Center for Textile Research and Development and will be conducted in the Center's laboratories. Classes in the College of Agriculture will include cotton production, ginning, and marketing, as well as animal fiber production. A bachelor of science degree can be attained in a four-year program which requires the satisfactory completion of 131 semester credits.

A very attractive aspect of the new curriculum is the provision that a student finishing the first four years with a 3.0 grade point average, or better, will automatically be accepted in the graduate school of the College of Business Administration. Prerequisites for a master's in business administration will have been taken during the last year of the bachelor's program, and the student will have an opportunity to get an MBA in only two more semesters.

Students at Texas Tech and in area high schools have found this new program to be of considerable interest. The prospect of earning a bachelor's degree in four years and then a master's in business administration in one more year appeals to many young men and women. Besides that, our feed-back from textile managers and executives indicates the five-year graduate should be well prepared for a career in the textile industry.

The Texas Tech University committee developing this program has now completed its work. The new curriculum should be ready for beginning students by the fall semester 1989, but many of the lower-level requirements can be taken prior to that time.

We believe this new program will better prepare students for management and eventually executive positions in the textile industry, and the International Center is giving it strong support. This is a continuation of our work to assist textile education and manufacturing.

COTTON QUALITY FROM DIFFERENT PRODUCTION LOCATIONS

What happens to the quality of a certified variety of cotton when it is produced in two widely separated locations? The officers and directors of the South Texas Cotton and Grain Association wanted to know the answer to that question, and they sponsored research at the International Center that would help with an understanding.

Some members of the Victoria, Texas based cotton organization have been growing DPL 50 in the Corpus Christi area, and they were aware that the same variety was also produced in Arizona. Because they wanted to know if the two locations were yielding different quality, the Association sent representative bales from both areas to the Center for evaluation.

We found the results of this comparison interesting. We believe our readers will, also, especially in view of the fact that there seems to be some price differential between the cottons produced in the two areas. With permission of the South Texas Cotton Association, we plan to carry fiber testing and spinning results of the study in next month's issue of *Topics.*

SERVICE CHARGE BOOKLET

From time to time we find it necessary to review the charges for the routine tests we perform. This is done because test methods occasionally change, and there are times when new instruments are added to our laboratories, thereby adding a new test procedure. Our periodic review does not necessarily mean that we increase our rates but rather that we want to have representative charges for the work we do.

We list these charges in a service charge booklet, and we have recently prepared a new one. Our updated book is now available and has already been sent to those on our current list of research sponsors. Prices given are effective as of November 1, 1988.

Anyone interested in receiving this information should contact the International Center.

VISITORS

Visitors to the International Center during September included G. Rodney Pilsbury and Paul McHugh, Crosrol Inc., Greenville, SC; Andre J. Frederic and Arthur E. Brunner, Rieter Corporation, Spartanburg, SC; Carl Cox, Natural Fibers & Food Protein Commission of Texas, Dallas, TX; J. L. Rogers, Hoechst/Celanese, Spartanburg, SC; Roger Bolick, Allied Fibers, Hopewell, VA; I. "Abe" Bitar, Metito International Inc., Houston, TX; John McLain, Dobisky Associates, Keene, NH; Howard Baker, J. D. (Butch) Johnson, M. D. Medlin, Don Nordin, W. R. Ridgeway, J. R. Waddell and Jack Crooks, Milliken & Company, Spartanburg, SC; Pat Seethapathy, TDS Foundry Corporation, Rosenberg, TX; Leslie M. Thompson, Texas Women's University, Denton, TX; Joyce Everhart, Pride Publications, The Woodlands, TX; and a class of forty Agricultural Economics students from Texas Tech University's College of Agricultural Sciences.

International visitors included Sam Coulton, Coulton Farming Co., Goondiwindi, Queensland, Australia; Keith A. Coulton, The Oilseeds Marketing Board, Sydney, New South Wales, Australia; Boeta Joubert and Johan Gillen, South African Cotton Board, Pretoria, South Africa; Hennie J. Groenwald, KMP-Compton, Pretoria, South Africa; Earl J. Wood, Wool Research Organization of New Zealand, Christchurch, New Zealand; Juan M. Munera, Enrique G. Molina and Cristobal G. Munoz, Las Palmeras S. Coop. Andaluza, Seville, Spain.