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DELTA & PINE LAND COMPANY SPONSORS TRAINING PROGRAMS

The Delta & Pine Land Company of Scott, Mississippi sponsored two 1-1/2 day training conferences at the International Center during February. The first began early on Feb. 5 and ran until noon on the 6th. The second began at l:00 p.m. the 6th and was concluded at 4:30 on the 7th.

The Delta & Pine Land Company requested these meetings to assure their employees a thorough understanding of cotton production and utilization. The first conference was attended by 25 persons; 22 were present for the second session.

The program included instruction on:

- Development and production of cotton;
- Classing: manual vs. high volume instruments;
- Value of cotton fiber testing results including *length, length uniformity, strength, fineness, maturity, micronaire, color* and *trash content;*
- Utilization of test results for predicting spinning performance and yarn quality;
- A study of textile processing, cleaning and carding, for preparing cotton for spinning;
- Yarn manufacturing: ring and rotor spinning, yarn numbering systems, and yarn characteristics for various end-products.

Members of the International Center staff giving lectures on the various subjects were Dick Crill, Harvin Smith, Edwin Foster and John Price; and, from the USDA Classing Office in Lubbock, Jerry Kuhlers.

We are pleased to organize conferences of this type whenever there is a request for them. As we have mentioned before, we do not conduct these on a regular basis as some institutions do; rather, we cooperate with various sponsors to hold such programs at a time suitable for their schedule and with subjects conforming to their interests. An extra benefit we realize is getting to know the many fine people attending.

We particularly appreciate responses from them after the completion of each conference, such as the following letters from D&PL participants:

From Matt Keating of Bedford, Texas:

"I just wanted to tell you how good a job you did at the D&PL Training Session. Thanks!"

And from Donald L. Kimmell, Vice President/ Marketing, Scott, Mississippi:

"We, at Delta & Pine Land Company, want to express our appreciation to you for a super job done during our recent seminar. Everyone that I have talked to felt the course was just great and something we really needed."

Thanks, friends, for the kind words.

A STUDY OF NEPS AND THEIR ORIGIN

For as long as textile manufacturers have attempted producing quality yarns and fabrics, small tangles of fibers called neps have been a problem. These imperfections are mostly man-made, and when processing cotton it seems easier for man to make neps from immature fibers than from mature ones. The problems are that neps give an inferior appearance to yarn and then appear as light or white spots in a dyed fabric. Regardless of how they are considered, neps are undesirable and often give an unacceptable product.

Over the years, neps have been measured in a number of ways, beginning with taking a small sample of cotton from a bale and having a technician pull this apart fiber by fiber to count the neps at that point. Another method used extensively in past years has been to take a portion of the web coming from a card and counting the neps in a given area, such as 100 square inches. That may not be practical today with the use of high-production cards that often form the web under a cover on the front of the machine. An instrument produced by Zellweger Uster, Inc. contains an imperfection counter which is used by many to quantify neps as yarn is measured for evenness. This instrument is very useful and is widely accepted, but questions have been raised concerning what is measured as a nep and whether everything counted will actually show up as an imperfection in a dyed fabric. Some have asked if the nep measured is a tangle of mature fibers, immature fibers, a seed-coat fragment, or some other particle of trash about the same size as a nep. In view of this we thought it appropriate to determine the correlation between measured neps during various stages of processing and the neps seen as white specks in dyed fabric.

The following has been taken from a report prepared for the Texas Food & Fiber Commission, which sponsored our nep measurement research.

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The data obtained in this study came from 36 cottons which were grown primarily in Texas and selected to provide a wide range of fiber properties. The cottons were first evaluated by testing procedures including high volume instruments, the normally accepted individual instruments, the Peyer AL-101, and the IIC/Shirley Fineness/Maturity Tester. Subsequently, neps were measured in card webs at standard revolving-flat cards which give access to the web prior to forming the sliver. Using the Zellweger Uster instrument, yarn imperfections (thin places, thick places and neps) were measured on both ring and rotor-spun N_e 16 yarns. These yarns were later dyed and woven into fabric for further nep counts.

TABLE I: CORRELATIONS WITH FIBER PROPERTIES

	F/MT II Maturity	F/MT II Fineness	2.5% Span Length	Micronaire
Card Web Neps	-0.8275^a	-0.5214^a	-0.2316	-0.7204^a
Rotor Yarn				
Thin Places	0.2017	0.6593^a	-0.6872^a	0.4889^b
Thick Places	-0.0601	0.5042^b	-0.6885^a	0.2780
Neps	-0.3752	0.1711	-0.5495^a	-0.0553
Ring Yarn				
Thin Places	-0.3371	0.1590	-0.7874^a	-0.0600
Thick Places	-0.1688	0.1749	-0.5530^a	0.0287
Neps	-0.0640	0.0287	0.3216	0.0529
Fabric Neps				
Ring	-0.7703^a	-0.5091^b	-0.3646	-0.7057^a
Rotor	-0.4744^b	-0.2658	-0.4661^b	-0.3952
Fabric Neps and Trash				
Ring	-0.8314^a	-0.5963^a	-0.2225	-0.7670^a
Rotor	-0.6132^a	-0.3641	-0.4114	-0.5087^b

a = significant at 0.1% level b = significant at 1.0% level

After testing was completed, analyses were performed to establish correlations between selected fiber properties and neps measured in card web, yarn and fabric. Table I gives these correlations. It will be seen that the neps measured in the card web showed the greatest association with fiber maturity. The high correlation was somewhat surprising considering the sometimes negative opinion of card web tests.

In a portion of this study not reported here, there was found a mutual correlation between fiber maturity and fineness, and it seems likely that the correlation between card web neps and fineness is a result of the relationship between fineness and maturity.

It was observed that there was a statistically significant relationship between micronaire value and card web nep count, although the correlation was inferior to that involving fiber maturity. For the cotton included in this study, maturity and micronaire were well correlated (r = 0.902). This supports the general knowledge that immature fibers are primarily responsible for neps that are visible in the card web. An attempt was made to establish the relationship between card web neps and fiber length. It was found that such a correlation was not statistically significant, which came as a surprise since fiber length is often considered to be an influence on nep formation.

One of the more interesting aspects of this study was to learn that there are some similarities and some differences between the imperfections measured in the two types of yarn. Thin places in rotor yarns were negatively correlated with fiber length but positively correlated with fiber fineness. In ring yarns, however, thin places were mostly associated with fiber length, and correlations with the F/MT results were poor. Additionally, thick places in rotor yarns were mostly associated with fiber length and fiber fineness, while in ring yarns, only fiber length had a significant, although negative, correlation. Neps in the yarns were poorly correlated with fiber maturity, micronaire, fineness and length. It was only in the rotor yarns that a statistically significant correlation was found, and this was a negative relationship with fiber length. For ring yarns, the correlation coefficient was positive although not statistically significant.

When evaluating neps in the fabric, it was found that these were better correlated with fiber maturity, regardless of the type of yarn used. Correlations with micronaire and fineness became

TABLE II: CORRELATIONS BETWEEN NEP MEASUREMENTS

	Card Web Neps	Rotor Fabric Neps	Rotor Fabric Neps & Trash	Ring Fabric Neps	Ring Fabric Neps & Trash
Rotor Yarn					
Thin Places	-0.1602	0.0587	-0.0135		
Thick Places	0.1991	0.1326	0.1332		
Neps	0.4301^b	0.2049	0.2635		
Ring Yarn					
Thin Places	0.1878			0.4645^b	0.356[illegible]
Thick Places	0.0512			0.2701	0.1679
Neps	0.1235			-0.1020	0.0260
Card Web Neps		0.3001	0.4003^c	0.6761^a	0.7305^a

a = significant at 0.1% level; b = significant at 1.0% level; c = significant at 5.0% level progressively less significant. In the fabric made from rotor yarns, the correlation between fiber length and neps was statistically significant, although negative.

Table II shows the correlation between the various forms of imperfections at the different stages of processing. It will be observed that few of the correlations are statistically significant. There was poor association between the Uster-measured thin places and card web nep counts for rotor and ring yarns, and there was equally poor correlation for thick places. The association of rotor yarn neps with card web neps was positive and statistically significant, while the relationship with ring-spun neps was not statistically significant. For rotor yarn, the correlations between yarn and fabric imperfections were poor, with the highest relationship existing between yarn neps and neps and trash in the fabric. Even so, this was only 0.26.

For ring yarn data, fabric imperfections were best correlated with the frequency of thin places. There was an obvious lack of correlation between ring yarn neps and fabric imperfections.

Table II shows that correlations between card web neps and fabric imperfections were statistically significant for fabrics made from ring-spun yarn. For fabrics woven from rotor yarns, only the nep and trash count had a correlation with card web neps. The reason for the poor correlation with rotor yarn data probably lies in the fact that nep and trash particles are often removed by the opening roller into the trash collection system.

Conclusions drawn from this study are:

1. Card web neps were best explained by fiber maturity.
2. There was no significant correlation between card web nep count and fiber length in this sample set of cottons.
3. Yarn imperfections, as measured by the Uster imperfection indicator, were generally most highly correlated with fiber length.
4. Yarn imperfections correlated poorly with card web nep counts.
5. Fabric imperfections (visible) showed greatest association with fiber maturity.
6. Fabric imperfections were poorly associated with yarn imperfections.
7. Card web nep counts provided better explanation of fabric imperfections than yarn imperfections.

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We want to express our appreciation to the Texas Food & Fiber Commission for permitting us to publish this condensed report in *Textile Topics*. We will be glad to send the full report to anyone who requests it.

CORRECTION

We would like to apologize to Adam Meredith Jones of A. Meredith Jones & Co., Ltd., Liverpool, England. In last month's listing of students at the January/February Texas International Cotton School we misspelled Adam's name as "Adam Merith Jones," and gave his company's name as "A. Meredith Jones & Co., ***Inc***." Even though we proof read *Topics* at least twice, this slipped past us. Adam, if you visit us again, we promise to get things right next time!

VISITORS

Visitors to the International Center during February included David Hambrick, Rip Johnston and Phillip Williams, Lindale Manufacuring, Inc., Greenwood Mills, Lindale, GA; Joseph Ready, Batson Yarn & Manufacturing Group, Greenville, SC; Kuk Y. Chun, Ssang Bang Wool, Ltd., Dallas, TX; Byung Chan Kang, Ssang Bang Wool Ltd., Seoul, Korea; Peter Kandel, Kandel Cotton Co., Dallas, TX; Dieter Ollinger, Sulzer-Ruti, Spartanburg, SC; Dan Stokes, Richard Heiniger and Stirling Weaver, Rieter Corporation, Spartanburg, SC; Lawrie Williams, Tongaat Cotton, Kempton Park, South Africa; Steve Clarke, Fiberite, Greenville, TX; Peter Frerichs, ECOM Agency, Bremen, West Germany; and Irena Brezinova and Tomas Cabela, Centrotex Ltd., Praha, Czechoslovakia.

Also visiting were sixty-four students from Seminole High School, Seminole, TX.