



Dr. M. Dean Ethridge
Director

ETHRIDGE NAMED ICTRD DIRECTOR

The new Director of the International Center for Textile Research and Development is Dr. M. Dean Ethridge. His employment by Texas Tech University became effective on July 15, 1993.

Dr. Ethridge assumed the position upon his return from three and a half months in Egypt, where he directed a study on the cotton textile industry in that country. Previously, he served as the Deputy Administrator for Policy Analysis with the Agricultural Stabilization and Conservation Service, USDA, in Washington D. C.

Over a period of 21 years, Dr. Ethridge has accumulated experience in cotton and textiles while working in academia, government, international projects, the National Cotton Council of America, and private enterprise. He will draw on all these experiences in directing the center's various research, service, consulting, and education programs.

His formal education is in agricultural economics, with a B.S. degree from Texas Tech University and the M.S. and Ph.D. degrees from the University of California at Berkeley.

Dr. Ethridge's family consists of his wife, Lanell, and two daughters, Lisa and Tiffany. To all of them we say welcome!

STICKY COTTON EXAMINED IN TEXAS – OKLAHOMA REGION

There is a growing concern worldwide about "sticky" cottons; therefore, pressures are mounting for some type of certification regarding stickiness. Sellers of cotton from areas where stickiness is known to be a problem may eventually find it necessary to furnish reliable data on it. Yet it is not at all clear that "stickiness" of cotton from different areas or of different varieties is similar, either in causes or cures.

The stickiness of cotton is usually greatest and first observed in the carding operation, where the cotton in the card web sticks to the crush rolls of the card. Since card performance is based on individual human judgement, it is not an "objective" test. However, it is an "absolute" test that provides one of the best methods available for evaluating stickiness. The Inter-

national Center for Textile Research and Development offers this test as a service to those in the cotton/textile industry who might desire it.

In order to examine the stickiness of Upland cotton in the Southwest, we used data from the 17 bales included in the ICTRD report, "Texas Cotton Quality Evaluation: Crop of 1992." These sample bales came from USDA Marketing Service offices in Oklahoma (Altus) and Texas (Abilene, Corpus Christi, El Paso, Harlingen, Lamesa, Lubbock and Waco).

Exhibit 1 on the next page summarizes pertinent data used in this study. The last column gives card ratings assigned to each bale. Results are classified as "not sticky" (rating = 0), "slightly sticky" (rating = 1), "moderately sticky" (rating = 2), and "very sticky" (rating = 3). The bales in the table are arranged with

Exhibit 1: Data Used To Examine Stickiness Of Texas/Oklahoma Cottons

Bale No.	Gin Location/Classing Office	Soluble Sugar (%)		Micronaire	Maturity (%)	Seed-coat Fragments (No./20 gr)	Card Rating*
		Plant	Total				
2390	Raymondville/Harlingen	0.623	0.563	4.3	99.0	52	0
2474	Dill City/Altus, OK	0.344	0.416	4.9	93.5	78	0
2446	Westbrook/Waco	0.376	0.446	4.7	90.3	45	0
2455	Moreman/Corpus Christi	0.643	0.609	4.6	90.2	69	0
2408	Kleberg/Corpus Christi	0.318	0.376	4.9	89.1	49	0
2430	Loving, NM/ El Paso	0.531	0.616	3.9	86.3	68	0
2475	Dill City/Altus, OK	0.568	0.629	3.9	79.9	51	0
2449	Miles Co-op/Abilene	0.622	0.646	3.8	79.6	30	0
2389	Raymondville/Harlingen	0.444	0.416	3.9	78.3	73	0
2451	O'Donnell/Lamesa	0.987	0.939	3.0	72.7	49	0
2454	Miles Co-op/Abilene	0.574	0.576	4.3	89.5	119	1
2429	Tornillo/El Paso	0.588	0.600	3.8	84.0	69	1
2448	Terry County/Lubbock	0.573	0.686	3.9	80.4	49	1
2452	O'Donnell/Lamesa	0.730	0.783	3.3	70.6	47	1
2453	O'Donnell/Lamesa	0.896	0.813	3.2	74.2	67	2
2447	Terry County/Lubbock	0.666	0.689	3.0	65.4	108	3
2450	Terry County/Lubbock	1.082	1.156	2.4	56.7	126	3
Sample Average		0.6215	0.6446	3.87	81.16	67.6	0.7

* 0 = Not Sticky 1 = Slightly Sticky 2 = Moderately Sticky 3 = Very Sticky

Source: Sample cottons are from "Texas Cotton Quality Evaluation, Crop of 1992," ICTRD

the card rating groups in ascending order; within each group of card ratings, the bales are arranged with the maturity levels in descending order.

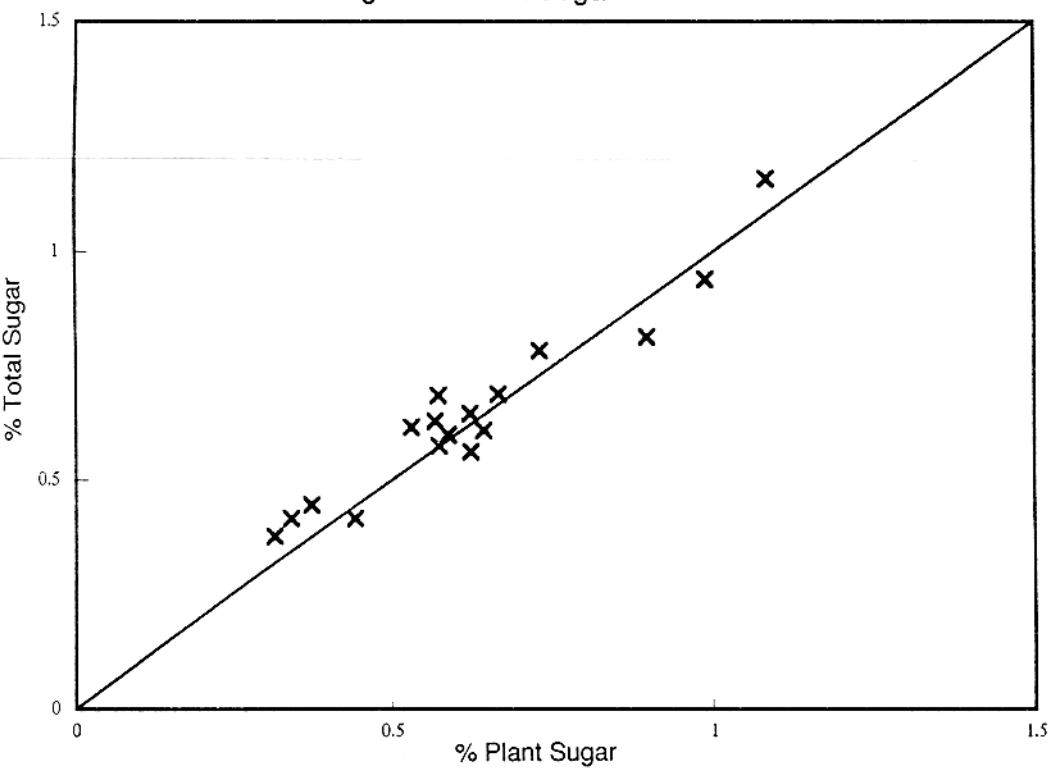
Inspection of Exhibit 1 reveals that 10 of the 17 bales (59%) were not sticky and four of them (23%) were slightly sticky; therefore, 82% of the bales would not be expected to cause processing problems. One bale tested moderately sticky and two tested very

sticky; these three bales (18%) would be expected to cause processing problems in most textile mills.

Stickiness is most commonly associated with an excess of soluble sugar; furthermore, the excess sugar is commonly blamed on insect contamination (often called "honeydew"). However, soluble sugar levels can also be elevated by the failure of fibers to mature completely, since immaturity implies that some of the plant sugar will not have been converted to cellulose.

A technique we have found useful for determining the source of stickiness (maturity vs. insect contamination) is to compare measurements of "plant sugar" (before hydrolysis) and of "total sugar" (after hydrolysis). Exhibit 2 has the 17 pairs of soluble sugar measurements plotted around the line of equality (the 45-degree line) for these measurements. Departures from the line of equality are small, with plotted points falling on both sides of the line. With results like these, our con-

Exhibit 2: Total Sugar vs. Plant Sugar



clusion is that processing problems related to the soluble sugars are coming largely from those sugars within the plant, rather than from insect contamination.

Since fiber maturity is inversely related to soluble sugar content, there should be a significant negative correlation between these data in the sample studied.

In fact this is true; the correlation coefficient between total sugar and maturity is -0.77 (with -1.00 being a perfect correlation).

Another major cause of stickiness is seed-coat fragments. The sticking is caused by the fragments themselves and by the accompanying cottonseed oil that gets deposited on the crush rolls. Seed-coat

fragments may result from poor ginning, from seed immaturity, and from genetically weak seed coats.

While micronaire is correlated with both maturity and seed-coat fragments, its inability to discriminate between fineness and maturity limits its usefulness for predicting stickiness. A careful statistical analysis using a variety of test data identified two causal variables as the most reliable indicators of card performance: **maturity** and **seed-coat fragments**. These two variables explained about three-fourths of the total variation in card ratings and none of the other variables could improve the prediction of card performance.

The scatter plot of card ratings versus maturity (Exhibit 3) reveals the inverse relationship between these variables. Plotting card ratings versus seed-coat fragments (Exhibit 4) reveals the positive relationship between them. Therefore, the combination of a low maturity value with a high count on seed-coat fragments will predispose a high card rating.

CONCLUSIONS:

Based on this limited study, processing problems associated with stickiness in the 1992 crop from the Texas-Oklahoma region are likely

Exhibit 3: Card Rating vs. Maturity

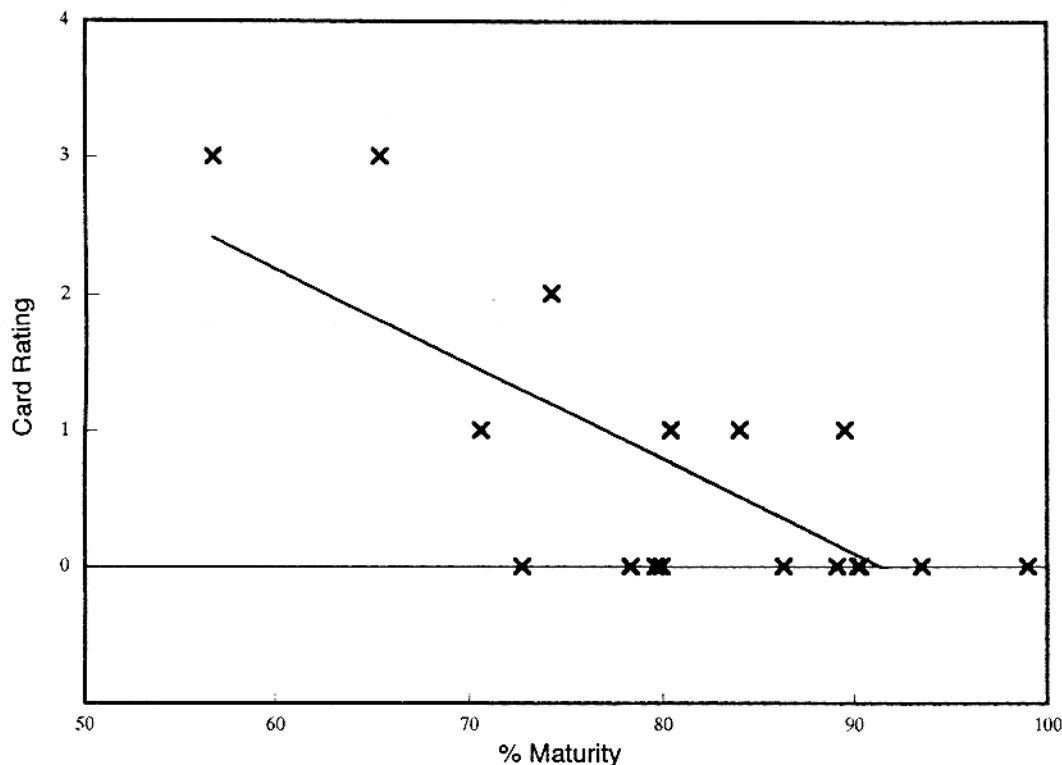
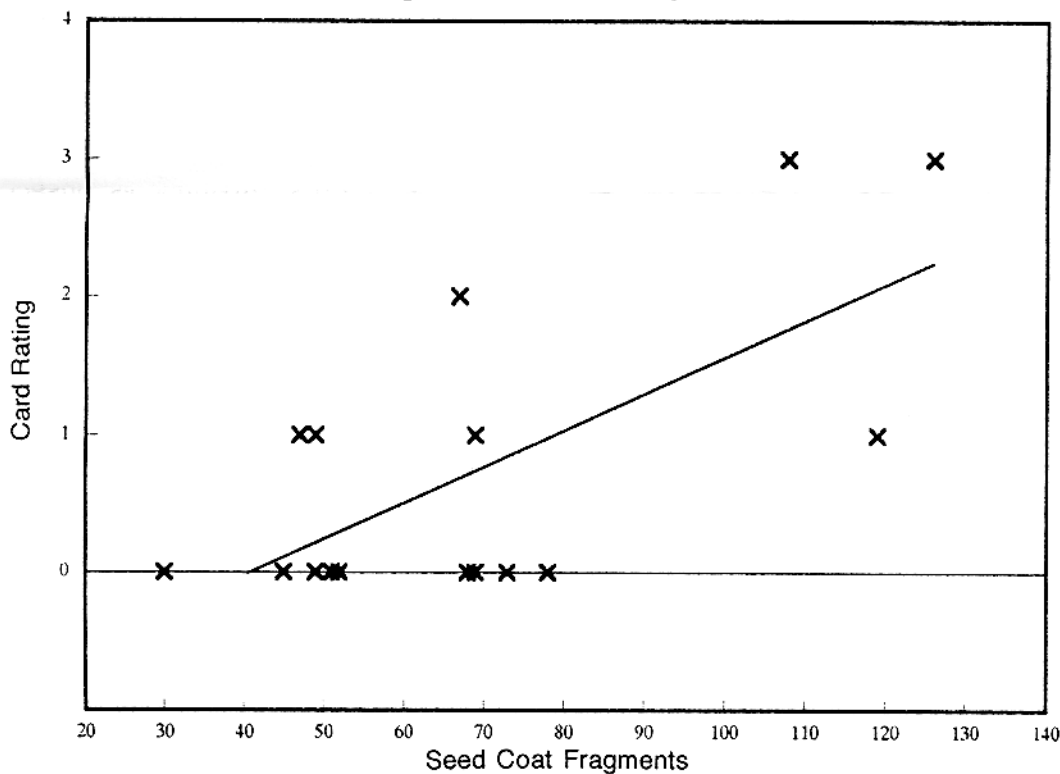


Exhibit 4: Card Rating vs. Seed Coat Fragments



to have come from cotton classed in the Lubbock and Lamesa offices. Furthermore, the main cause appears to be immaturity rather than insect contamination.

Seed-coat fragments also account for significant increments in stickiness. It is noteworthy in Exhibit 1 that bale number 2454, from the Abilene office, exhibited good maturity (89.5%) but a high level of seed-coat fragments (119). The elevated number of fragments probably explains why the cotton was judged to be "slightly sticky," rather than "not sticky."

The occurrence of low maturity (below 75%) or high seed-coat fragments (above 65) increases the likelihood of processing problems associated with stickiness (card ratings of 2 or 3). If **both** of these conditions occur, the likelihood of poor card performance is greatly increased.

These results are tentative, since they are based on a small sample of cotton. Additional research, using appropriate experimental controls, are needed to (1) improve measurements of soluble sugars and of their relationships with maturity, (2) clarify what factors cause stickiness in different cottons from different areas, and (3) develop approaches for preventing stickiness and for alleviating processing problems caused by it.

This project was sponsored by the Texas Food and Fibers Commission and directed by Bobby G. Wyatt, Analytical Chemist at the ICTRD. Mr. Wyatt may be contacted for information on the card performance test for stickiness that is offered by the ICTRD.

CARL COX SCHOLARSHIP

Carl Cox, longtime Director of the Texas Food and Fibers Commission is retiring as of September 1, 1993. In honor of Carl Cox's leadership and support in all fields of the textile industry, the Carl Cox Endowed Scholarship has been established at Texas Tech University. The scholarship will be given to a graduate student majoring in Clothing, Textiles and Merchandising who plans to pursue collaborative research at the International Center for Textile Research and Development during their studies at Texas Tech.

Contributions may be sent to the Texas Tech University Foundation for the Carl Cox Scholarship in care of Dr. Elizabeth G. Haley, Dean, Texas Tech University, College of Human Sciences, Box 41162, Lubbock, Texas 79409-1162.

DEVER AND WYATT VISIT BRAZIL

Dr. Jane K. Dever, Head of Materials Evaluation Lab and Bobby G. Wyatt, Analytical Chemist at the International Center for Textile Research and Development, attended and presented papers at a seminar titled "1st National Encounter of HVI Users" in Recife, State of Pernambuco, Brazil from May 11-16, 1993. The encounter was part of COTTON BRAZIL and sponsored by the Brazilian Agriculture Ministry and several local cotton companies.

Brazil has recently become an importer of cotton, resulting in some new problems for the Brazilian textile industry. One such problem is cotton stickiness. Mr. Wyatt's presentation discussed the possible causes and methods of detecting sticky cotton, the effects of sticky cotton at the gins and mills, and ways to minimize sticky cotton's adverse effects in textile processing. Wyatt's trip was sponsored by the Brazilian Agriculture Ministry.

To help in the transition from processing only Brazilian cotton to blending cotton from other countries, some textile mills have purchased High Volume Instrument lines. Dr. Dever presented a paper on the use of HVI technology in which she covered the history of HVI and the USDA calibration procedures. In addition, she was invited to tour various textile mills and research facilities. Most of them were equipped with HVI lines which were being used to blend cottons and enhance processing performance. Dr. Dever's trip was sponsored by the Brazilian Agriculture Ministry and the Organization of American States, Washington, D.C.

DONATIONS

Recent donations to the Center have included:

- from Textube Corporation, Greer, South Carolina – four cases of plastic cones;
- from Dayco Corporation, Greenville, South Carolina – aprons for Saco Lowell ring spinning frames.

We wish to express our gratitude to these organizations for their generosity in providing supplies for our activities. Such donations are most helpful in continuing and maintaining our commitment to research.

ANNOUNCEMENT OF JOB OPENINGS

Two professional positions are open at the International Center for Textile Research and Development, and qualified applicants are needed. The positions are:

Head of Fibers Research – Conduct research in physical measurements, instrument evaluation and fiber performance. Applicants should be skilled in writing research proposals and reports and in managing research projects. Knowledge of cotton varieties, production methods and growth areas would be helpful. Other qualifications desired are:

- Degree in Textile Engineering or Textile Technology;
- Experience in conducting research projects;
- Experience in textile testing;
- Aptitude for oral presentations and seminar teaching.

Specialized training and related work experience can be substituted for advanced degrees if relevant to the position, but advanced degrees in a related field will be advantageous.

Manager of Chemical Processing Laboratory –

Direct activities of a fully equipped lab that is an integral part of a broad-based research, consulting and service center for the fibers/textiles complex. Must be able to communicate effectively with both industry and research people. Qualifications desired include the following:

- Degree in Textile Chemistry or Textile Engineering;
- Experience with bleaching and dyeing of natural, man-made and blended fibers;
- Experience with visual and computer color matching;
- Ability to collaborate in research planning and execution and to solve dyeing and finishing problems.

Inquiries and resumé's should be sent to:

Dr. Dean Ethridge, Director,
P.O. Box 5888, Lubbock, TX 79408-5888;
Phone (806)747-3790; Fax (806)747-3796.

ICTRD WELCOMES MR. KHALAF MABROUK

Mr. Khalaf Mabrouk, an assistant researcher at the Cotton Research Center in Giza, Egypt, will be doing research at the International Center for Textile Research and Development until October, 1993. During his stay at the Center, he will develop his laboratory skills, familiarize himself with state-of-the-art equipment, and interact with other researchers. Also, he will attempt to identify American cottons that are best suited for blending with Egyptian cottons. We welcome Mr. Mabrouk and look forward to his research results.

VISITORS

Visitors to the International Center during the past few months have included the following:

- Virginia Belew, Job Training Partnership Act, Big Spring, Tx;
- Walter Montgomery, Jr., Joe B. Herlong and Jimmy Bennett, Spartan Mills, Spartanburg, SC;
- Gordon Standly, Spartan Mills, Augusta, GA;
- Carl Cox, Texas Food & Fibers Commission, Dallas, TX;
- Herb Wright, Wright Fibers, Big Spring, TX;
- Derek Hess, Twistex Incorporated, Anaheim, CA;
- David Clapp, Cotton Incorporated, Raleigh, NC;
- H. O. Humphrey, Greenville Machinery Corp., Greenville, SC;
- Jim Ritchey, Instron, Dallas, TX;
- Larry Harris, Sara Lee Hosiery, Winston-Salem, NC, with Sonya and Cheston Harris;
- Andre J. Frederic, Rieter Corporation, Spartanburg, SC;
- J. C. Mathiews, Texas & Midwestern, Woodson, TX;
- O. C. Collins, Jr., Frances and Steve Collins, Bramwell Yarns USA, Midland, TX;
- Dan R. Bradshaw, Eastland, TX;
- Julie de la Fouchardiere and Nicolas Henry, Compagnie Cotonniere, Paris, France;
- Wally Mitchell, Bourke Shire Council, Bourke, New South Wales, Australia;
- M. Miraftab, Bolton Institute of Higher Education, Bolton, England;
- Mira Merme, London Business School, London, England;
- The USDA-FAS Junior Professionals, on tour of the U. S. South Central area. The group included Dale Cougot, Ignacio C. Diaz, Jr., Peter Downing, Barbara Elliott, Janet Kavan, Patricia Kiefer, Rob Lerman, Aileen Mannix, Pamela McKenzie, Henry Noland, Virginia Olson, Paul Spencer, Scott Thompson, Clarissa Valdivia, Mike Woolsey and Andy Dumovic;

VISITORS (Continued)

- Twenty-one participants in the Texas Tech University Minority Engineering Program;
- Thirty members of Grace Baptist Church, Fort Worth, TX;
- Seventeen Texas Agricultural Extension Service Area Clothing Specialists;
- Twenty-five 4-H club members from Seminole, TX;
- Nine Dawson County 4-H members; and
- Forty-five participants in the 4-H TechStyles Trends, a state-wide conference held at Texas Tech University.

NOTICE OF PUBLICATION SCHEDULE

Beginning with this issue, *Textile Topics* will be published on a quarterly basis. Our goal is to put out four issues each year that are sufficiently informative to warrant your valuable reading time. This is the fall issue; the winter issue should arrive by January.