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TEXTILES AND APPAREL NEWSLETTER

Contents

Announcing

March Inservice - TXA Youth Program

CHARLOTTE COFFMAN AND BETH DAVIS

Join us on campus on March 18, 1-5:00PM for a TXA Youth Program inservice. The workshop will include an overview of the 4-H Clothing and Textiles Program, time for resource sharing among participants, and a discussion of future program directions. Possible topics for discussion include State Fair categories, key volunteer issues, and linking textile content with youth development.

This workshop will also involve participants in the development of a new arts and science series on materials. Participants will select **one** of these hands-on experiences.

Beyond Tie-Dyeing - focuses on resist techniques for making designs on cloth. A resist (such as wax, thread, or starch) covers and protects part of the cloth during the dyeing process. Uncovered areas of the cloth accept the dye to create a design. This workshop was offered at the Grab & Go Conference and Textile Expo in 2001.

Fabrications - acquaints participants with textile structures. Participants will try creating fabrics by weaving, braiding, looping, or knotting. This workshop has not been previously offered.

Watch POUCH mail and your email for registration packets.

ENGAGING YOUTH

In-Touch Science Receives NSF Funds

CHARLOTTE COFFMAN AND BETH DAVIS

In March, 1994, In-Touch Science was born when a Research-Extension Integration grant was received by TXA and DNS. Eight years later, more than 1400 adults have been trained to deliver In-Touch Science programming in 43 states. Total numbers for participating children are difficult to collect, as leaders do not always submit written data. To date, we have received approximately 14,000 records documenting children's experiences with In-Touch Science activities.

In addition to the four In-Touch Science publications, the team has designed a portable exhibit, developed a webpage <www.human.cornell.edu/txa/extension/intouch/> or <www.intouch.cornell.edu>, created teaching kits, built an In-Touch Science lending library, sponsored 53 training grants, and given 28 workshops and other presentations.

An extensive database has been established based on records from workshops, training grants, and children's evaluation forms. One-third of the participating adults were contacted by e-mail or telephone. These interviews revealed that 41% of the respondents are still using In-Touch Science. Most users have integrated the curriculum into their annual program cycle. The majority report that the children are enthusiastic about the program and are increasing their ability to communicate about science. The leaders report an increased comfort level in using the experiential learning cycle and in facilitating science activities with children.

Supplemental funding from the National Science Foundation has been received for year 2002. This will allow us to continue to offer:

- workshops
- mini-grants of $150 to workshop graduates who want to train other adults
- free supplies to those who submit evaluation forms from activities done with children
- additional analyses of the evaluation data

Publications are available from the Cornell Resource Center <http://www.cce.cornell.edu/publications/catalog.html>. Teaching kits can be purchased from West Hill Biological Resources <http://www.westhillbio.com/>

For additional information about workshops and mini-grants, check out our website or contact Beth Davis or Charlotte Coffman (contact information on back of newsletter).

Pattern companies McCall and Butterick have agreed to a merger in an effort to cut costs. Each pattern company will maintain its identity, including Vogue that is manufactured by Butterick.
—American Sewing Guild Notions, 2001

ENHANCING SAFETY

Vegetable Growers Speak Out

CHARLOTTE COFFMAN

Many thanks to the 114 growers who returned the questionnaire on Spray Equipment and Protective Clothing. Of the 112 respondents who used pesticides, 90% use boom sprayers, 37% use hand-operated sprayers, and 30% use air-blast sprayers. Other sprayers were used by less than 10% of the respondents. All except eight respondents are using some type of engineering controls. The most popular are hydraulic boom folding (54%), enclosed tractor or truck cab (51%), mounted hand-wash water supply (47%), low-drift nozzles (45%), multiple nozzle bodies (39%), and container rinse system (38%). The engineering controls that respondents are most interested to try are direct pesticide injection (43%), closed transfer system (37%), tank rinse system (37%), and low-drift nozzles (33%). Respondents are least likely to purchase air-assisted boom folding (43%) and pulley/cable boom folding (37%). Only three respondents indicated that they are not using any engineering controls and have no interest in acquiring any.

New York State Vegetable Growers Association members are knowledgeable about protective clothing requirements. Many noted that they wear whatever is required by the pesticide label. Gloves, coveralls, and half-face respirators are worn most often. An increase in the use of protective footwear was noted when compared to earlier surveys.

Although about 95% of the respondents are using engineering controls, only 15% say that they use less protective gear as a result. Nonetheless, only 27% believe they need more information on this topic. Several growers noted that protective clothing requirements for different spray equipment can be found on the pesticide label.

Farm/crop magazines and Pesticide Applicator Trainings/Workshops continue to be the most popular ways for pesticide applicators and handlers to obtain information about spray equipment and protective clothing. Brochures (49%) and videotapes (30%) are preferred by some. Only about 16% use the Internet for this type of information.

This survey was conducted by Andrew Landers and Mike Helms (Biological & Environmental Engineering) and Charlotte Coffman (Textiles & Apparel) with funding from an USDA-CORNELL FARM SAFETY grant.

Note: Two brochures, Solutions for Safer Spraying and Brush Up on Covering Up, were distributed with the questionnaire. Copies of both brochures are enclosed with this newsletter.

EXPLORING FABRICS

Spider Silk Beyond Charlotte's Dreams

LAURA CUTTER AND CHARLOTTE COFFMAN

The silken webs of Charlotte and other spiders have long captured the attention of their insect victims, nature lovers, and, yes, readers of children's stories. Any material strong enough to support an energetic spider, flexible enough to absorb the impact of a flying insect, lightweight enough to move with the wind, and resistant enough to withstand rain has to be pretty special. Now, scientists can produce spider silk without touching the creepy crawlies.

Spiders produce several types of silk. All are very fine, ranging from 0.5 to 20 micrometers in diameter. For comparison, a strand of human hair measures approximately 50 micrometers. Spider silk is stronger than any other known natural or synthetic fiber. *Dragline* silk produced by the golden orb-weaver spider is four times stronger than steel of the same diameter. Spider silk is elastic. *Capture* silk can stretch to two or three times its original length without breaking.

Uses for this extraordinary material are numerous and exciting, but gathering sufficient quantities is a challenge. Spiders do not make long fibers like silkworms and spider silk is so fine that it would take 400 spiders to produce one yard of cloth. In addition, spiders are not particularly social. A spider farm would look like a war zone as the territorial arachnids do their best to kill and eat the competition.

Rather than raise spiders, scientists are exploring other production methods through careful study of the original. Scientists at the University of Wyoming determined the DNA sequences for the spider silk genes. Cornell researchers use nuclear magnetic resonance imagery to study the internal structure of the spider's silk glands and X-ray diffraction to decipher the molecular structure of the fiber. University of Massachusetts faculty are studying the degradation of the fibers. They learned that spider silk proteins are composed mostly of six different amino acids. The order of these amino acids, the length and shape of their chains, and number of chain repetitions define the silk's properties.

In 1990, a genetic scientist in the US Army discovered a way to mass produce spider silk. He extracted a gene from the golden orb-weaver spider and transferred it to a standard laboratory bacteria, which then produced the protein that comprises silk. The protein was dissolved and extruded into fiber.

Although genetically-engineered bacteria can make silk proteins, only small amounts are produced and the polymers are short-chained. Nexia Biotechnologies, a Canadian firm, has collaborated with university researchers to implant spider silk genes into goats. Proteins from the milk of these goats yield spider silk. The first goats with spider silk genes were born about two years ago; the company hopes to have sufficient animals for large-scale silk production by 2002.

The US Army has proposed using spider silk in bulletproof vests, parachutes, and helmets. Others are focusing on reinforcing cables such as bridge cables or catapult cables for aircraft carriers. Because silk is biocompatible, these fibers are being developed for medical uses such as tissue engineering, sutures, artificial tendons and ligaments.

Sources:

1. Access Excellence: Bioengineered Spider Silk. <http://www.accessexcellence.org/WN/SU/spider.html>
2. Hatch, Kathryn. Textile Science, West Publishing, St. Paul, MN, p 161. 1993.
3. HyperTek -- Spider Silk. <http://www.sfgate.com/hypertek/9706/spider.shtml>
4. Just-style.com USA: Synthetic Silk Better Than the Real Thing. September 7, 2001 <http://just-style.com/news>
5. Manning, Anita. Spider Silk May Solve Knotty Surgical Problem, USA Today, December 8, 1995.
6. Miller, Steve. Spider Silk — Spinning a Strong Thread, ChemMatters, American Chemical Society, p.10-11. February, 2001.

GATHERING RESOURCES

TXA Lending Library

CHARLOTTE COFFMAN

Remember that the TXA Department maintains a lending library of teaching kits, videotapes, and books. To review the full inventory, check our website <http://www.human.cornell.edu/units/txa/lendinglib/index.html >

Below are some recent additions:

Teaching Kits

- Clothing Decisions: A Style of Your Own
- Simple Gifts

Videotape and Study Guide

- Fabric to 501's: Levi Strauss & Company, Creative Educational, Lubbock, TX.

The making of blue jeans from the delivery of the denim to the final garment. 19 minutes.

Books (for In-Touch Science: Fibers & Animals)

- All About Cotton, Julie Parker
- All About Silk, Julie Parker
- All About Wool, Julie Parker
- Animals and our Clothing, The Wool Council
- Art of Feltmaking, Anne Vickrey
- Color Analyzers, GEMS Series
- Clothing: the Portable Environment, Susan Watkins

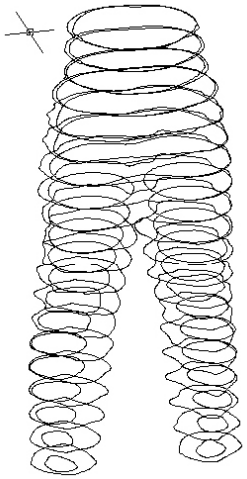
- Eyeopeners! All About Animal Vision, Monika Dossenbach and Hans D. Dossenbach
- Fiber Facts, Frances Kozen
- Making Cheese Butter and Yogurt, Gardenway
- Of Cabbages and Chemistry, GEMS series
- The Secrets of Animal Flight, Nic Bishop
- Unraveling Fibers, Patricia A. Keeler and Francis X. McCall

SUPPORTING INDUSTRY

Be the First in Your Group to be Body Scanned

FRAN KOZEN, SUZANNE LOKER, AND LORA COWIE

The April 2001 *TXA News* described body scanning technology and the acquisition of a 3D body scanner in the Textiles and Apparel department at Cornell. Professors Susan Ashdown and Suzanne Loker now have two research studies in progress using the body scanner. You can be a part of their research and be the first of your friends to be scanned. Or you can share the experience with your friends and make appointments for the same time. Scanning involves creation of a 3-D photographic image using eight cameras and four eye-safe lasers to capture more than 300,000 data points on a person's body. The process takes only 12 seconds to be completed. It is easy and *very* high-tech.



Stacked slices show the relationship of clothed and unclothed scans to one another

The objective of Study I is to develop a method to adjust apparel industry sizing systems to the body measurements of target markets based on the body scan data. For this study, we are recruiting women between the ages of 35 and 54 who wear pant sizes 4-24. We will take two body scans of each woman, one in a one-piece, Lycra scanning suit and one in dress trousers from a major women's wear manufacturer. Appointments for this study can be made from January 21st - February 28th.

Study II is an investigation of body size and shape of women 55 and older in order to improve the size and fit of clothing. For this study, we will need five body scans of each woman in a one-piece Lycra scanning suit. Appointments for participation can be made through February 8th.

Participation in either study involves scanning and completion of a questionnaire. It will take approximately 30 minutes and subjects will be paid $20 for their time. The body scanning facility is located at Cornell University, Department of Textiles and Apparel, 217 Martha Van Rensselaer Hall. Parking permits will be provided.
Contact: Lora Cowie at 607-255-8031 or e-mail lsc26@cornell.edu.

For additional information, visit www.human.cornell.edu/txa/extension/appind/bodyscan.

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