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## COTTON FOUNDATION 2004-2005

### CHAIRMAN'S MESSAGE

The Cotton Foundation vigorously carries out its mission of encouraging, facilitating and conducting cotton research and education.



However, the Foundation yields its support to projects that can help the [National Cotton Council](#) (NCC) carry out its mission of providing U.S. cotton industry members a world marketplace advantage.

That edge is new technology - in the form of new products, systems or techniques. All [Foundation-supported projects](#) are aimed at developing these tools to help industry members reduce their fiber production, processing and handling costs. Projects seek solutions in the areas of market development, profitability and regulatory.

The Foundation is providing consistent support for the U.S. cotton industry. For 2003-2004, the Foundation was able to direct more than \$420,000 in support of 33 general research and education efforts. For 2004-2005, trustees approved 29 projects funded at \$393,000. This undergirded several ongoing projects as well as support for such new efforts such as the International Cotton Genome Initiative Workshop and efforts to develop module/bale management strategies through inventory control.

Non-dues grants from some members have enabled the Foundation to sustain 12 special projects. In addition, individual Foundation member firms continued to provide direct support for some of the NCC's communications vehicles, the [Cotton's Week newsletter](#) and the [AgDay Cotton's Week](#) program. Such partnerships are invaluable and can benefit the NCC immeasurably in sustaining its mission and propelling U.S. cotton's success in the world marketplace.

For the past several years, the Foundation consistently has retained [70-plus members](#). This level of commitment from agribusiness demonstrates a willingness to help meet the challenges necessary for ensuring a viable U.S. cotton industry.

I believe this partnership will continue to be of mutual benefit for both the industry and its supplier firms as U.S. cotton seeks to strengthen its presence in a marketplace becoming ever more global.

**Larkin Martin, Chairman 2004-05**  
**The Cotton Foundation**

*(Martin served as 2003-04 Cotton Foundation president)*

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## **PROJECT SUPPORT**

*The following projects received Cotton Foundation support in 2003-2004.*

### **Expanding Kansas Cotton Production Research and Education Programs**

The escalation in Kansas cotton production mandates the establishment of a quality research and education program that will provide useful, timely and profit generating information to cotton growers in this new cotton growing region.

Kansas State University researchers continue to train educators and expand their research and demonstration programs, including cotton seminars held at four sites in January of 2004. The Kansas State University Research & Extension Cotton program for 2004 also included a series of county variety, growth regulator and harvest preparation demonstrations, on-farm replicated population and insect control studies, and one replicated double-cropping study.

Their long-term objectives are to: 1) develop a base of cotton production oriented results applicable to the higher elevation cotton growing regions of Kansas and 2) develop and grow an infrastructure of information disseminators.

### **Management Impacts on Seed Quality, Crop Microclimate and Arthropod Populations in Arid/Semi-Arid Environments**

Scientists at New Mexico State University are seeking to understand the relative impact of different management practices on insect populations. Their work in 2003-04 specifically focused on determining the impact of plant node and position on seed quality; relating characterizations of egg damage to specific predators, determining the effect of irrigation timing and plant population on insect pest egg hatch rates, and determining the effect of temperature and relative humidity on development of beet armyworm and cotton bollworm.

Among their findings in this project was that mortality is extremely high for bollworms exposed to desert-like condition with both low relative humidity and high temperatures. However bollworms exposed to only high temperatures or low humidity had relatively high survival.

### **Emissions From a Multi-fueled Burner for the Cotton Industry**

The vendor that had originally agreed to provide a burner has not had one available since the funding was in place for this project – which aims to collect data on emissions from burning cottonseed oil.

Once a burner is secured, engineers at the USDA-ARS Southwestern Cotton Ginning Research Laboratory in Mesilla Park, NM, hope to be able to collect data in about three months.

### **Other Projects**

*Progress reports are pending for the following 2003-04 Foundation-supported projects:*

- Use of Cotton Fibers as Support Media for Akaganeite Filters
- Conversion of Allis Chalmers 860TXB Cotton Harvester for Plot Research
- Module Management Education Program: Building, Covering, Transporting and Tracking
- Screening Converted Race Stocks (CRS) for Cotton Seedling Drought-Tolerance
- Determination of Actual Boundary Line Gin Particulate Emission Concentration Levels
- Evaluation of Acetone as an Extraction Solvent for Cottonseed
- Cyclone Study

*Other 2003-2004 projects that received ongoing support are described below.*

## **GENERAL PROJECTS: AGRONOMY/PHYSIOLOGY**

### **Cotton Management Systems Utilizing Subsurface Drip Irrigation and Conservation Tillage on the Texas Rolling Plains**

Research at the Texas Agricultural Experiment Station has shown that drip irrigation significantly increased cotton yield over furrow-irrigated cotton by 48 percent (3.7 bales/acre vs. 2.5 bales/acre).

The key objective in 2004 was to verify results through study of another cotton crop. Inline flow meters will be installed to accurately determine the amount of irrigation water applied to furrow irrigated plots. It is important to have these data so water use efficiencies and economics of production can be compared between these two irrigation systems.

A third cotton crop study will be completed during 2005 to verify results and publish data. An economic analysis of the three years of data will be performed that will include cost/benefit ratios for cotton production under drip versus furrow irrigation.

### **Prediction and Alleviation of Crop Stress for Yield and Quality Stabilization**

University of Arkansas scientists' work has shown that high night temperatures in the Delta are particularly detrimental to yield.

In 2004, the researchers are seeking to quantify the effect on boll growth and fiber of high night temperature periods. They also are developing a management model to predict and alleviate crop susceptibility for yield stabilization for cotton producers.

## **GENERAL PROJECTS: FIBER QUALITY PRESERVATION**

### **Cotton's Quality Task Force (QTF) Initiative: Confronting the Cotton Industry's Quality Challenges**

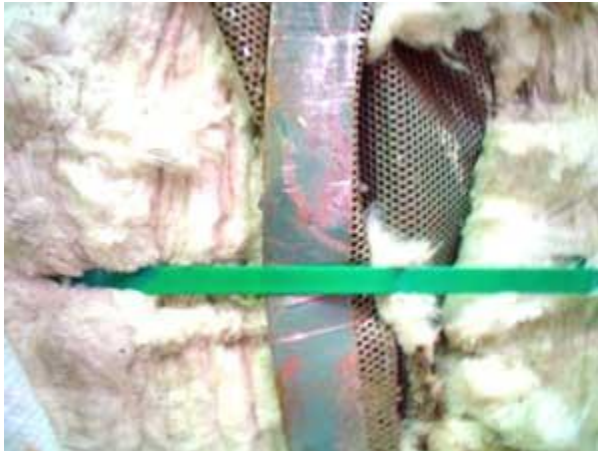
The National Cotton Council's Quality Task Force (QTF) provides a forum for reaching consensus on U.S. cotton industry quality initiatives. By recognizing and describing all quality factors associated with raw cotton, the industry can remain confident that the market receives and sends the correct signals to growers, ginners and others who are competing in international markets for market share. The industry remains focused on evaluating methods to determine cotton lint quality and utility.

A late 2003 QTF meeting included reviews of sticky cotton research, moisture studies, new ginning technologies, USDA Agricultural Marketing Service reports, short fiber and nep measurement, and lint contamination. The QTF Committee's statement on bale moisture became the basis for NCC and industry action on that issue.

## **Lint Contamination Education and Prevention Program**

Industry participation in ongoing contamination prevention initiatives – including aiming for zero tolerance - is crucial to the survival of the U.S. cotton industry.

NCC staff is reviewing and updating NCC contamination educational materials, and making them available in the latest communications vehicles, including power point and compact disk. In addition, NCC Member Services staff will be trained to help deliver this message across the Cotton Belt.



**The NCC's zero tolerance program is aimed at preventing this piece of metal, plastics and any foreign material from contaminating seed cotton and lint.**

## **Development of Objective - Performance Related Test Protocols for Bale Packaging Materials**

The need exists to develop and standardize simulated handling tests to more rapidly screen bale packaging materials for determining worthiness for field testing.

National Cotton Council packaging specialists are developing draft protocol proposals for predicting packaging performance related to floor abrasion, breakout force, tear/snag resistance, wire-bagging shear, vapor permeability, air flow and resistance, stack stability, water resistance, and condensation. The need exists to develop and standardize simulated handling tests to more rapidly screen materials for determining worthiness for field testing.

Bale packaging specifications, testing procedures and requirements of currently approved materials also will be reviewed and the existing data base of performance criteria will be correlated with data from new procedures.

## **Maintaining Cotton Lint and Seed Quality During Module Building and Storage**

This project is aimed at providing guidance to module cover manufacturers, ginners and producers about the characteristics needed to protect seed cotton stored in modules.

Researchers at the Texas Agricultural Experiment Station continue to: 1) evaluate the performance of new and used cotton module cover materials in resisting the formation of defects and moisture penetration. This includes discovering the modes of cover defect formation: 1) breakdown by UV-light, 2) cracking during storage, 3) puncture by sticks or burrs. They also will continue to evaluate and refine the operation of module builder design modifications intended to generate more moisture resistance shapes. This includes comparing modules' shapes after several days of storage and determining differences between those formed with and without a retrofit installation.

Data from this three-year project eventually will be shared with an engineering professional society for updating obsolete cover standards.



**A rainfall simulation by Texas A&M University researchers determines moisture penetration of a module cover sample.**

## GENERAL PROJECTS: GENETICS

### Support for International Cotton Genome Initiative Workshop

Cotton must have the genetic research resources to compete successfully with man-made fibers in the international textile fiber market, and it must have a genetic research infrastructure to enable its researchers to capture federal plant genetic research dollars that are commensurate with the value of the crop to the U.S. economy. This project is helping facilitate the biennial International Cotton Genome Initiative (ICGI) workshop/meeting. The meeting's primary focus will be on reporting progress in development of cotton genomics and identifying new needs of cotton genomics. The event also should create a better interface between the commercial sector (starting with breeding and biotechnology) and ICGI, which is largely composed of public researchers. Contributions already have been made but more sponsorship from appropriate organizations and groups, internationally and domestically, is being sought to develop the meeting which is listed and described at <http://icgi.tamu.edu/meeting/2004/>.

### Determination of a Method to Break the Yield Plateau

There is a need to find a method to significantly increase yield without increasing production costs. Work at the Texas Agriculture Experiment Station is aimed at developing germplasm with significantly increased yield potential. Studies thus far indicate that the weight of fiber per seed trait is heritable and controlled by several genes. Thirty one breeding lines with at least 90 mg lint/seed were performance tested in 2003. Trials included comparisons of the lint per seed of several lines under irrigated and rain-fed conditions. Preliminary data show that the genotypic differences remain relatively constant. Another interesting find is that many of the high lint per seed lines produce larger seed and fewer seed per boll. Some of the lines studied in 2003, along with some new materials, are being performance tested in 2004. Research will look at what, if any, detrimental factors are associated with increased number and weight of fiber per seed. Yield tests will be conducted for promising materials to determine if increased yields occur.



**A Cotton Belt yield plateau has Texas Agriculture Experiment Station researchers trying to develop germplasm with significantly increased yield potential.**

## GENERAL PROJECTS: GINNING

### Engineered Systems – Seed Cotton Handling and Ginning

Efficiency of field-through-ginning operations has led to a decrease in the number of gins in Texas since 1960, from 1,400 to less than 275 active gins in 2003. If that trend continues, the ginning industry could be in jeopardy by 2018.

A goal of this project is to minimize seed cotton storage costs while processing 5 million bales with 200 or fewer gins. Texas A&M University researchers are formulating a minimum of three practical scenarios for a new seed cotton handling, storage and ginning system – and that may include extending the ginning season.

They also are formulating a feasible seed cotton transport system from the field to storage area that could be implemented at a Texas location with the gin service area expanded to 100 and 150 miles. This includes studying the use of semi-tractor trailers or other systems for moving seed cotton from the turn-row to long-term storage locations near a gin.

### Dispersion Modeling for Low-Level Point Agricultural Sources

Past research by the Texas A&M engineers has demonstrated that models used by EPA over-predict downwind concentrations of PM<sub>10</sub> by up to 10 times when applied to emissions of low-level point agricultural sources (LLAPS) such as cotton gins, feed mills and grain elevators.

The procedure for EPA approval of new models requires that results be within two percent of existing, approved models. As already demonstrated, the existing model (ISCST3) for use in LLAPS applications, results in as much as a 250 percent over-prediction in estimated concentrations.

The engineers are working with the Texas Commission on Environmental Quality and other researchers to change the process by which new models – using one hour weather data while still accounting for wind direction variation - are considered and approved for use in LLAPS applications.



**John Wanjura, a Texas A&M University graduate student, prepares to extract fine dust from a gin trash sample using an air wash.**



## Evaluation of FRM PM2.5 Samplers Using the Coulter Counter Multisizer

The Texas A&M researchers also are trying to develop a **process** that will result in corrections of "over sampling" of PM10 and PM2.5 concentrations of agricultural PM so that agricultural operations are appropriately regulated.

The scientists have been able to demonstrate to EPA the errors in sampling agricultural dusts with EPA approved samplers. They are conducting laboratory experiments with PM2.5 samplers after finding that the samplers do not perform the same when exposed to "real world" PM. That PM includes a wide range of particle sizes unlike the PM in the EPA evaluations that are all the same size.

The scientists also are redesigning their constant concentration chamber to facilitate collection of additional performance data, to allow them to neutralize the charge on particles, to quantify and control the air flow more accurately, and ensure uniform air flow and PM concentrations throughout the chamber.

## Module/Bale Management Strategies: Inventory Control through the Adoption of Advanced Supply Chain Technology

This project is aimed at developing identification systems that ensure Permanent Bale Identification information remains with cotton bales from the time bales are made at gins until the lint in the bale is spun into yarn. NCC staff is investigating the potential of Radio Frequency Identification (RFID) technologies to improve the locating, tracking, and managing of modules, module tarps and cotton bales.

Successfully integrating RFID tags into gin module and bale management practices – a move that has profit potential for the industry - is dependent on efficient and widespread adoption. NCC staff is working to: 1) develop a program capable of demonstrating how this technology, implemented at the gin level, can integrate bale management strategies across the links of the supply chain and 2) quantify the economic benefits to each participant in the supply chain.



**NCC staff is investigating the potential of radio frequency identification technologies to improve the locating, tracking and managing of modules, module tarps and cotton bales.**

## GENERAL PROJECTS: INFORMATION/EDUCATION

### Web Page Development for Reniform Nematode Management in Cotton

Plant-parasitic nematodes annually reduce cotton yields by \$413 million. It is estimated that the reniform nematode alone annually costs each producer from 100 to 500 lbs. of lint per acre or \$55 to \$275 per acre – a total Beltwide yield loss of \$177 million.

A reniform nematode management web page will be developed in cooperation with the nematologists in Alabama, Arkansas, Louisiana and Mississippi. Producers will have access to the page, which will integrate all management options into a total nematode management package. That includes information on cultural practices, tolerant varieties, rotations with non-host crops and chemical management.

### Enhancing Cotton Industry Education and Information through the National Cotton Council Web Site

The NCC's web site, [www.cotton.org](http://www.cotton.org), is a cost-effective method of communicating and helping the organization handle increased information demands. The NCC's World Wide Web Project Team continues to guide the site's development as a central online information source about the U.S. cotton industry.

Among recent improvements and additions to the site: online posting of the NCC and Cotton Foundation annual reports and archiving of previous reports; implementation of the first phase of the NCC Intranet; publication of several technical documents such as [Specifications for Permanent Bale Identification Bale Tags](#); and redesigning and moving all educational materials to the [Cotton Counts web site](#) for download by educators and others.

Information flow was enhanced with such online form additions as the [Beltwide Cotton Conferences](#) call for papers and The Cotton Foundation project proposals.



**NCC moved its educational materials from its web site to the Cotton Counts web site to facilitate download by educators and others.**

## Electronic Publication of the Journal of Cotton Science

The quarterly, online *Journal of Cotton Science* (JCS), available at <http://journal.cotton.org>, offers ready access to multidisciplinary cotton research in areas ranging from genetics to economics. Offering scientists a rapid outlet for their findings, *JCS* has received and placed into peer review nearly 300 manuscripts. Published manuscripts contain an interpretive summary that explains the research's value in layman's terms.

*JCS*, which is copyrighted, is published as Adobe Acrobat (PDF) files for optimum versatility and ease of publication. Now in its eighth year, *JCS* was the first all-electronic journal to be indexed in AGRICOLA, the database of the National Agricultural Library.

## Information and Research on Potential Consumer, Environmental and Workplace Risks

NCC staff is continually seeking and evaluating opportunities to enhance the U.S. cotton industry's ability to operate in today's regulatory environment.

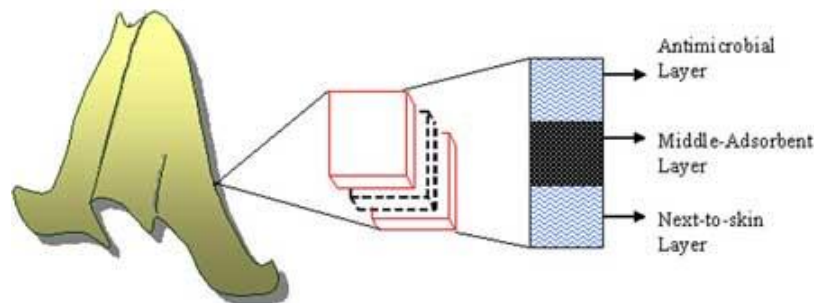
Progress has been made, for example, toward: 1) amending fire and building codes that impact cotton bale storage; 2) obtaining data important to flammability standards being developed for mattresses/filled bed products and upholstered furniture, 3) compiling statistics helpful to retaining cotton beneficial amendments to the Children's Sleepwear Flammability Standard; 4) gathering information for maintaining reasonable air emission regulations for cottonseed oil mills and avoiding potentially negative rules governing oilseed processing and oil regulations; and 5) acquiring test results on particulate matter (PM) emissions from cotton gins to help avoid unworkable cotton dust regulations.

## GENERAL PROJECTS: NEW PRODUCTS

### Development of Cotton Based Nonwoven Chemical and Biological Warfare Protective Substrates: Significant Development and Further Research

Efforts are progressing to establish cotton as a high-tech fiber and to find advanced applications such as cotton-based decontamination wipes and inner liners for chemical and biological warfare protective suits.

The first year's research at Texas Tech University included development of lightweight needlepunched cotton nonwovens. Results showed that available "state-of-the-art" H1 needlepunching nonwoven technology is capable of developing lightweight cotton nonwovens from coarser cottons. If successful, U.S. upland cotton not only can contribute to our homeland security and national defense but realize enhanced consumption. A longer-term objective is to enable the U.S. cotton industry to be the global leader in high-tech nonwoven cotton research.



**Efforts are progressing to establish cotton as a high-tech fiber, including development of a three-layer, cotton-based decontamination wipe.**

## GENERAL PROJECTS: PEST MANAGEMENT

### Cotton Insect Information

The Cotton Insect Hotline provides access to timely cotton insect situation reports, notification of field days and other in-season meetings.

Because of advances in electronic communication, only Alabama (by phone) and Arkansas (web site) used this service in 2003 and 2004 to disseminate collected insect data on budworm and budworm species composition and resistance information. Entomologists in Alabama relay information on moth flights and resistance monitoring, while those in Arkansas assemble information from surrounding states on moth monitoring to keep growers in that state informed on population levels and movement.

### Surveys of Cotton Losses to Pests

Annual estimates of cotton losses due to specific disease, insect and weed pests are made broadly available to public and private sectors. The Cotton Belt data, gathered at the Coordination Center at Mississippi State University, are useful for: 1) analyzing the market potential for new plant protection products, 2) establishing the importance of currently registered products that are threatened by cancellation or use restrictions and 3) setting research and educational priorities.

This loss data also is extremely important with regard to planning, funding and directing research by the public and private sectors. For example, the escalated use of Bt cotton raises concerns among entomologists and farmers about the bug complex becoming cotton's most destructive insect pest, displacing the *Heliothines*.

The databases of 1978-2003 insect loss and weed loss data and the 1952-2003 disease loss data have been completed. This information was published on the 2004 Beltwide Cotton Conference Proceedings CD-ROM, placed on the NCC web site for downloading and made available to others requesting the database.



**Annual cotton loss estimates to insects such as the whitefly help in formulating control strategies.**

## **Investigations of Race 4 *Fusarium oxysporum* var *infectum* in California cotton: Field Scouting and Host Plant Resistance**

Analyses of samples collected in 2001, 2002 and 2003 have not identified the presence of either of the two Australian strains of *Fusarium* in SJV cotton in California cotton. However, after the identification of the Race 4 strain of *Fusarium oxysporum* (FOV) in the state, a 50-entry variety evaluation was begun in a field where the initial 2003 cotton planting was widely damaged by a *Fusarium* infestation.

Results were presented to seed company representatives in October 2003 and discussed with select individuals with the California cotton industry and the California Department of Food and Agriculture. Research project staff has set up grower, consultant and company meetings and distributed newsletter articles to improve awareness of potential concerns of newly-recognized and identified strains of *Fusarium*.

In 2004, researchers continued to offer to collect samples and evaluate fields for existence of race 4 or other strains of FOV in any fields identified by growers or consultants; and initiated and tested a greenhouse method to screen cotton lines and varieties for relative resistance to Race 4.

## **GENERAL PROJECTS: PRECISION AGRICULTURE**

### **Report and Evaluation of Advanced Hyperspectral Remote Sensing for Detection of Cotton Water Stress and Irrigation Refinement**

Researchers at the University of California – Davis have developed optimal vegetative indices to estimate cotton yield at the pre-harvest stage using remotely sensed imagery and have submitted a manuscript for publication from this work. They found, for example, that the relationships between water and chlorophyll were not identical across the field and that crop stressors are changing throughout the growing season.

From their work on this project they have published papers on variable soil moisture, imagery and mapping mineral content using hyperspectral images. They also have made significant progress on comparing the crop water content to irrigation demand, including finding a statistically significant relationship between image based estimates of canopy water content and the length of the period since the last irrigation.

The goal of 2004 work is to refine current results to improve the accuracy in which water demand can be predicted. The overall aim is providing the grower with accurate water content maps to allow integration of this information into farm management practices.

## **Improving Water Use Efficiencies in Cotton Production with Variable Rate Irrigation Systems Coupled to Remote and Local Sensing Systems**

Work by University of Georgia researchers has led to the development of a variable rate irrigation (VRI) system that retrofits on existing systems, saving water while maintaining production and profitability for the farmer and rural community. In 2002 and 2003, detailed information was collected on five VRI pivots located in different areas of Georgia. Along with millions of gallons of water savings, yield increased due largely to not over watering the boggy parts of the field and being able to apply more water to the very sandy spots.

Best use of VRI relies on good methods to help define a field's non-uniformity. Developing soil moisture sensing systems is also critical to providing feedback to the system and monitoring its effective use. Researchers believe that remotely sensed imagery coupled with wireless local sensing systems will enhance the economic and environmental benefits associated with efficient irrigation management. Their 2004 objectives are to: 1) develop and field test a rapid, cost effective system that can give growers a reliable estimate of VRI system's impact on a field and 2) couple the VRI system to a wireless soil moisture sensing system that will monitor water needs for each part of the field.



**A variable rate irrigation project in Georgia includes a research pivot that covers 6.75 acres on a field with several soil types.**

## **Database Development Project for Ground Image Sensor Based Variable Rate Application System**

Jackson State Community College scientists work thus far indicates that variable rate cotton production systems which utilize multispectral image analysis for crop production zone creation are profitable and likely to have wide success in commercial cotton production in the Mid-South.

Their investigation showed a cost savings of more than \$60 per acre in 2002 and 2003 for crop inputs with a yield increase of 63 lbs. per acre in 2002 and 163 lbs per acre in 2003. Total returns to the grower of \$90 plus in 2002 and \$150 per acre in 2003 resulted from the use of image technologies and variable rate application.

In 2004 they continued to develop a combined image/sensor based variable rate application system for cotton producers.

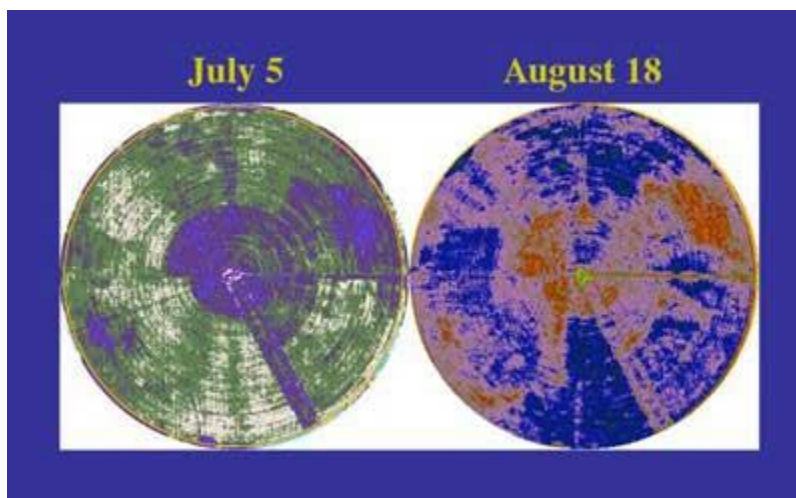
Their work is based on the Oklahoma State University- developed sensor control system. The overall aim is to allow a \$60-\$150 per acre decrease in production costs along with a potential yield improvement.

## **Remote Sensing Support of Precision Farming in the Texas High Plains**

Texas Tech University engineers are developing procedures for applying airborne remote sensing to site-specific cotton management, including the application of agrochemicals and irrigation, in the Texas High Plains. Information collected in this study will be used to evaluate differences in net income (gross income from the crop minus production costs, including costs of data acquisition) between precision agriculture and conventional crop management.

In 2004, remote sensing image data collected during the growing season will be used to delineate management zones within fields for variable-rate Pix and defoliant application. Yield mapping data will be analyzed for the variable-rate and uniform treatments using GIS software to determine significant differences and to evaluate the potential benefits of variable-rate versus uniform application. Fiber quality will be mapped for several fields from samples taken during harvest and analyzed by the International Textile Center.

Results of these experiments will be used to formulate a method for site-specific management to manipulate boll maturity and improve fiber quality in parts of fields that are prone to discounts.



**Texas Tech University engineers are developing procedures for applying airborne remote sensing to site-specific cotton management in the Texas High Plains.**

## **Precision Farming Technology for Developing Subsoiling Guidelines in Arkansas**

From research in 2002 and 2003, researchers at the University of Arkansas have determined that it is possible to identify compacted areas with soil electrical conductivity measures made by VERIS.

They are now evaluating VERIS and remote sensing technology for identifying and mapping soil compaction levels in the field. That information will be used to develop subsoiling guidelines for Arkansas cotton production based on the VERIS and/or Landsat data. Selective subsoiling of only compacted fields or compacted areas in a field could save up to \$15 per acre on production costs.

## **Multiple Farm Demonstration of Spatially Variable Pesticide Applications Based on Remote Sensing**

Variable rate technology based on remote sensing has been demonstrated in Louisiana with applications of plant growth regulators and defoliants. Louisiana State University researchers now are conducting demonstrations – aimed at producers, agricultural consultants and commercial pesticide applicators - of spatially variable insecticide use based on historical yields/profitability. Researchers also want to: 1) develop a better understanding of the economics of spatially variable inputs; 2) adapt the current prototype application system and evaluate performance on a commercial aircraft; and 3) validate the use of these technologies on multiple farms using various production strategies.

## **GENERAL PROJECTS: SEED QUALITY/SAFETY**

### **Value-Added Cottonseed Products**

Texas A&M University scientists, in collaboration with USDA Agricultural Research Service scientists in New Orleans and College Station, TX, continue to explore additional non-food and non-feed applications of cottonseed products such as a cancer-inhibitor, a concrete mold releasing agent and an alternative fuel for automobiles to improve combustion efficiency and reduce pollutants.

### **Commercial Use of Atoxigenic Strains to Prevent Aflatoxin Contamination in Arizona**

Aflatoxin contamination of cottonseed costs farmers \$30-\$50 per acre in Arizona but no reliable prevention methods exist. As the result of a decade of effort by USDA-ARS, the National Cotton Council and the IR-4 Biopesticide Program, the biopesticide atoxigenic agent, *Aspergillus flavus* AF36, received a section 3 registration for treatments in Texas and Arizona in 2003. The section 3 is for 30 months after which time additional data is required including verification of the quality and stability of product resulting from the full scale manufacturing process and additional molecular data on the characterization of AF36.

In 2003 more than 16,000 acres of Arizona cotton was treated with AF36. However, conditions for contamination were extremely severe and high levels of contamination occurred in some treatment areas. Analysis of the fungal communities associated with treated and untreated components of the 2003 crop are underway in order to assess efficacy of applications and agronomic practices most successful at achieving acceptable control levels.

In collaboration with the Arizona Cotton Research and Protection Council, several significant improvements to commercial scale manufacture of AF36 were made in 2003. Procedures to minimize loss of product quality in shipping containers will be addressed during 2004 and alternative shipping and storage containers will be evaluated with the aim of enhancing product stability and preservation.

### **Reduction of Aflatoxin Contamination in South Texas**

Research continues on determining the incidence and distribution of various types of *Aspergillus flavus* in South Texas. The most effective strain at displacing aflatoxin producers in all test years was the atoxigenic strain AF36, the same strain used in Arizona. During 2003, a section 3 registration was granted by federal EPA for *Aspergillus flavus* AF36 for unlimited treatments to cotton in Texas and Arizona. In order to retain the registration, expanded efficacy data for South Texas is being acquired. In 2004, treatments were expanded to three additional areas, including at least one in the Lower Rio Grande Valley. Mapping of *A. flavus* communities in South Texas continues, and a comprehensive map of strain distribution will be generated by the end of 2004 and used to interpret atoxigenic strain applications.



## SPECIAL PROJECTS

*Special projects are funded by Foundation members over and above their regular dues. Grant amounts listed for the special projects are per-year amounts. Some projects have been funded for a specific length of time while others are ongoing.*

### **Cotton Leadership Program**

**DuPont Crop Protection Grant: \$115,000**

The Cotton Leadership Program seeks to identify potential industry leaders and provide them with developmental training. A class comprised of four cotton producers and one member from each of the other six industry segments participates in five, week-long sessions. These provide: policy and issue discussions with current and former industry leaders; observation of production and processing and key research across the Cotton Belt; visits with lawmakers and government and regulatory officials in Washington, DC; attendance at the National Cotton Council (NCC) annual and mid-year meetings; and communications training. With the selection of the 2004-05 class in August, 220 men and women now have honed their leadership skills and been given the opportunity to assume positions of leadership in state, regional and national interest organizations. Many already have risen to take top posts within the National Cotton Council, Cotton Council International, The Cotton Foundation and other key organizations. The leadership program's alumni are active and the program maintains a web site at <http://leadership.cotton.org> that provides description, application forms and other useful information.

### **Congressional Staff Education/Orientation Program**

**Monsanto Grant: \$110,000**

House, Senate and committee staffers get to see U.S. cotton's production and processing infrastructure by visiting farms, gins and other facilities across the Cotton Belt. The orientation's overall aim is to raise lawmakers' awareness of an efficient U.S. cotton sector and its contributions to this nation. Another message conveyed during the tours is the U.S. cotton industry's need to compete profitably in the global marketplace. In 2004, a group of Washington, DC-based Congressional staffers toured industry operations in the Mid-South and visited NCC and Cotton Incorporated headquarters. Another Congressional group saw industry operations in West Texas and Arizona. During their tours, both groups also: 1) were shown public and private cotton research and adoption of leading edge technology and 2) visited with key industry leadership to gain valuable insights on concerns threatening U.S. cotton's health.



**Congressional staffers visited National Cotton Council headquarters and toured cotton production, processing and research in the Mid-South in August, 2004.**

## **Cotton Counts**

**Bayer CropScience Grant: \$100,000**

The goals of this NCC educational campaign are increasing consumers' understanding of U.S. cotton and appreciation of the industry's contributions to the nation's economic health and quality of life.

With a particular focus on students, the campaign is targeting the growing number of urban Americans who have lost their familiarity with production agriculture. The grant also helps the NCC provide communications and other training to National Cotton Women's Committee members. Armed with facts such as U.S. cotton's value-added retail impact of \$120 billion to the U.S. economy, these volunteers are carrying cotton's message from the schoolhouse to the state fair. Updates on NCWC members' activities and other campaign news and information can be found at [www.cottoncounts.net](http://www.cottoncounts.net).

## **Producer Information Exchange (P.I.E.)**

**FMC Corporation Grant: \$95,000**

More than 700 producers from across the Cotton Belt have benefited from this program – one that encourages its participants to maximize production efficiency and speed the adoption of proven technology and farming practices.

During four tours, cotton producers travel to one of the four specific Cotton Belt production regions to get face-to-face interaction with their peers and observe production techniques and technology in regions different from their own. Participants also are able to share information with each other on the week-long tours. This enables them to get new ideas and perspectives in such areas as land preparation, variety selection, planting, tillage, fertilization, pest control, irrigation and harvesting.

All P.I.E. alumni are encouraged to attend the annual Beltwide Cotton Conferences as a way to further their knowledge of innovative technology and farming methods.



**Southeastern cotton producers from left: Jerry Davis, Jay, FL; Ryan Gunter, Reevesville, SC; and Steve McAlhany, Branchville, SC; visited Tunica, MS, producer Justin Cariker's (far right) farm in August as part of the 2004 Producer Information Exchange Program.**

## **Cotton Council International (CCI) COTTON USA Advantage Program**

**Emergent Genetics Grant: \$75,000**

The COTTON USA Advantage Program supports CCI's overarching effort to increase demand for U.S. cotton fiber and cotton products – a vital endeavor as the U.S. cotton industry's profitability hinges on increased exports. This program enables CCI to leverage funds from USDA through the Market Access Program and from other global partners to carry out retail promotion, advertising and trade servicing activities under CCI's supply-push/demand-pull strategy. Included is the "Cotton Gold Alliance" program in which CCI is partnering with Cotton Incorporated to stimulate demand for U.S. cotton and cotton products in countries where traditionally healthy manufacturer and consumer cotton consumption has been blunted by man-made fibers.

## **Uniform Harvest Aid Performance Evaluation**

**Crompton, DuPont, FMC, Nichino America, Valent Grant: \$70,000**

Researchers continue to evaluate standard defoliation and desiccation treatments and newer practices and products. The goal is to use findings to develop effective, contemporary harvest aid recommendations that contribute to harvest efficiency. The scientists' initial findings were included in The Cotton Foundation Cotton Reference Book - *COTTON HARVEST MANAGEMENT: Use and Influence of Harvest Aids*. All of the reference books can be purchased by visiting [www.cotton.org/foundation/ref-books.cfm](http://www.cotton.org/foundation/ref-books.cfm).

## **Policy Education Program**

**Syngenta Crop Protection Grant: \$60,000**

Since this orientation program was initiated six years ago, more than 80 NCC producer members have been given the opportunity to learn more about the NCC's policy development and implementation process. As a result, many of those participants are involved in U.S. cotton's central organization today. Up to four producers from each major Cotton Belt region are chosen to attend the NCC's annual meeting, see the NCC's Washington, DC, operations and meet with key lawmakers.



**Policy Education Program participants for 2004 included: (sitting, from left) Brad Williams, Ron Lee, Jr. and Justin Cariker; and (standing, from left) Neil Strong (Syngenta), Harvey Schroeder, Frank Anaya, Claude Bundrick, John Fleming, Robert Royal, Thomas Kirkland, Jim Neufield, Jim Massey, IV, Heath Watson, Frankie Bezner and Marjory Walker (NCC).**

## **Cotton Nematode Research and Education Program**

**Bayer CropScience Grant: \$50,000**

Cotton Belt nematologists and plant pathologists meet annually to discuss their research and report on their nematode population surveys. The overall aim is to curb losses to nematodes across the Cotton Belt.

A special session on identifying and managing nematode problems was held at the 2004 Beltwide Cotton Production Conference. Information on nematodes, their distribution and control methods also can be found in the updated booklet, "Cotton Nematodes: Your Hidden Enemies" and at [www.cotton.org/tech/pest/nematode](http://www.cotton.org/tech/pest/nematode).

## **Cotton Seedling Disease Research and Education Program**

**Bayer CropScience Grant: \$110,000**

This program helps determine losses to the seedling disease complex. That complex took 4.02 percent of the 2003 crop - a value of \$336.6 million. The conditions in the Mid-South were especially severe in 2003 with Arkansas, Louisiana, Mississippi and Tennessee accounting for more than 50 percent - or \$181.2 million - of the reported Cotton Belt losses. The program also helps identify the basic disease spectrum in each locale and offers fungicide use and application methods in each state. More information is available to producers, consultants and others through the brochure, "Know Your Seedling Diseases," and at [www.cotton.org/tech/pest/seedling](http://www.cotton.org/tech/pest/seedling).

## **Technology Transfer through News Media**

**Monsanto Grant: \$18,000**

This program provides journalists with a well-equipped newsroom to enhance their information gathering and dissemination at the annual NCC-coordinated Beltwide Cotton Conferences. The 60-plus contingent of writers and broadcasters who cover this forum help transfer needed information to industry members ahead of the Conferences' proceedings. Rapid adoption of proven technology and cultural practices is essential for U.S. cotton producers to maintain optimum efficiency and maximize profit potential.

## **Beltwide Cotton Conferences Internet Quickstop**

**Syngenta Crop Protection Grant: \$7,750**

Strategically placed kiosks at the Beltwide Cotton Conferences contain computers that provide Internet access. This enables conferees to check their email and browse the World Wide Web.



**Several special projects support the NCC-coordinated Beltwide Cotton Conferences, including one that underwrites its Internet Quickstop.**

## Ongoing Special Project Contributions

Several special projects are still assisting the U.S. cotton industry even though the projects' annual grants have ceased.

The NCC still publishes the quarterly online *Journal of Cotton Science*, which has evolved into a premier database for multidisciplinary cotton research. The Foundation continues to distribute volumes in its Cotton Reference Book Series, which can be [ordered online](#).

The NCC and The Cotton Foundation recently completed a brochure on the Worker Protection Standard (WPS) that is now part of the curriculum for *Progressive Farmer* magazine's Farm Safety Day Camp<sup>®</sup> program. The Farm Safety Day Camp is coordinated and sponsored by The Progressive Farmer Foundation and corporate sponsors, including The Cotton Foundation. The entire [series of WPS newsletters and information sheets](#) is available online.

A special project also made possible the creation of [World of Cotton](#), which garners public recognition for the industry's economic significance to this nation.

A number of other Foundation activities are considered special projects and supported by specific member firms. In the Chemical Evaluation Project, for example, USDA Agricultural Research Service scientists at the Southern Insect Management Lab in Stoneville, MS, are analyzing insecticides and application methods with the goal of helping producers lower their insect control costs.

Some other efforts helpful to cotton's overall research and education effort include: the artificial rearing of southern crop insects and the cotton insect rearing and distribution programs; the ginning lab fiber analysis and the periodic development and distribution of various NCC-produced educational videotapes.

## AWARDS AND ENDOWMENTS

### Harry S. Baker Distinguished Service Award For Cotton

Gaylon Booker, who has played a pivotal role at the National Cotton Council (NCC) during his forty-plus years of service, beginning in Economic Services and culminating as president and chief executive officer, was honored as the recipient of the 2004 Harry S. Baker Distinguished Service Award for Cotton. Booker joined the NCC in 1961 as a market analyst eventually leading the NCC's Economic Services department, where he directed activities relating to world supply and demand for cotton and other fibers. Later, he served as vice president of Operations, and from 1988 until 2001 served as senior vice president. In March 2001, he became the NCC's president and CEO. Since his retirement in February of 2003, Booker has served as a consultant to the NCC.



**Gaylon Booker, right, who has played a pivotal role at the NCC during his 40-plus years of service, was presented the Harry S. Baker Distinguished Service Award for Cotton loving cup by 2003 NCC Chairman Bobby Greene.**

### Oscar Johnston Lifetime Achievement Award

This award is presented to an individual, now deceased, who served the industry through the NCC, and who demonstrated character and integrity as well as perseverance and maturation during that service. No award was presented in 2004. Former NCC President Jack Hamilton, who served the NCC continuously from 1969 until his death in December 2001, was honored posthumously as the 2003 award recipient.

### High Cotton Awards

**Farm Press Publications Grant: \$15,000**

Four cotton producers who share a common passion – a concern for leaving the air, land or water better than they found it - were recipients of the 2004 High Cotton awards. Each recipient meets the criteria that have dictated the selection of the High Cotton awards since the program's beginning in 1995; that is, they are full-time growers who produce a profitable, high quality crop while meeting the best standards of environmental stewardship. The 2004 winners were: Billy Sanders, Dooly County, GA; Fred Starrh, Corcoran, CA; Coyt Hendon, Porter Bayou, MS; and Ernest Bippert, Kingsville, TX

### **Robert and Lois Coker Trustees Chair in Molecular Genetics**

**Endowment: \$1,000,000**

The Coker Chair has helped Clemson University obtain general assembly appropriations for biotechnology research. The chair itself attracts not only a top-notch faculty member to fill it but additional exceptional faculty as well. The resulting momentum helps attract state investments in facilities such as the new science and technology center and the state-of-the-art greenhouse complex at Clemson. The Chair currently is vacant and a university search committee is seeking a replacement.

### **The C. Everette Salyer Fellowship in Cotton Research**

**Endowment: \$1,000,000**

This fellowship was inaugurated to honor the late California producer-ginner and former Cotton Foundation president, C. Everette Salyer. Doctoral and post-doctoral level students are able to study and conduct research geared to the sciences of producing and marketing cotton. It also provides funding for recipients to attend the annual Beltwide Cotton Conferences, where they are able to share their results with industry leaders. The current fellowship recipient is Randy Clouse, a graduate student in Texas A&M University's department of biological and agricultural engineering. He is developing and evaluating management strategies for a site-specific irrigation system for cotton crops. His research is aimed at optimizing water application to cotton, based on water availability and the cotton's physiological status. Clouse's fellowship will end in August 2005. The most recent endowment recipients received doctorates in 2003 from Texas A&M - Ernest Clawson, Ph.D. in agronomy, and Paul Ragsdale, Ph.D. cotton breeding.

### **Cottonseed Oil Clinic**

**Endowment: \$1,000,000**

Proceeds from a Mississippi Valley Oilseed Processors Association endowment support the Annual Conference of the Oilseed Processing Clinic. The clinic is jointly sponsored with the USDA Agricultural Research Service's Southern Regional Research Center and the National Cottonseed Products Association.

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