Corporate Overview

Kater Hake
V.P. Ag. & Env. Research

ICAC Research Associates
April 18, 2017

Our Mission

To increase the demand for
and profitability of cotton
through research and promotion

Cotton Incorporated Structure

All U.S. Cotton Growers &
All U.S. Importers of cotton

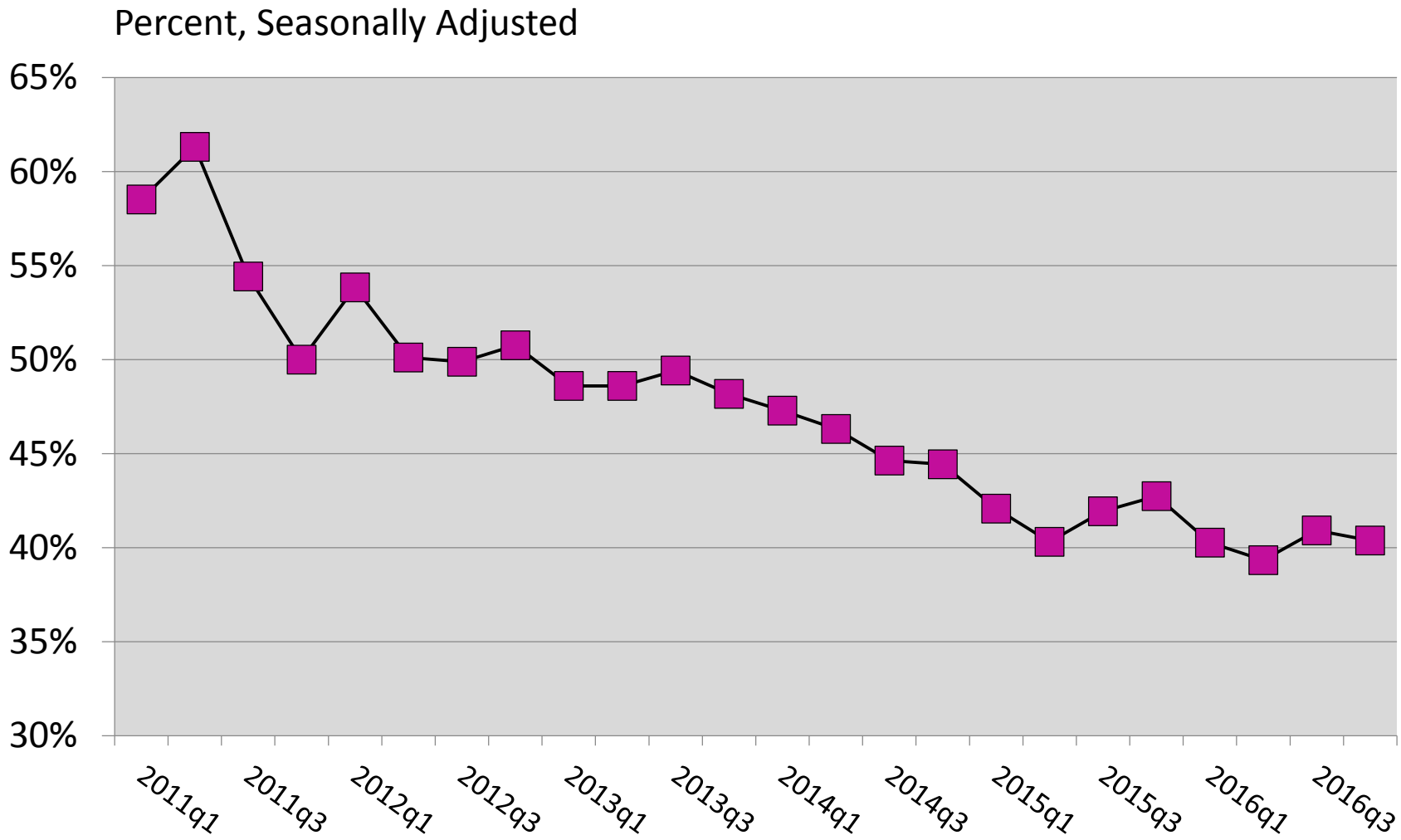
Board of
140 growers &
40 importers

Cotton Incorporated Offices

141 Full- time employees in 6 offices:

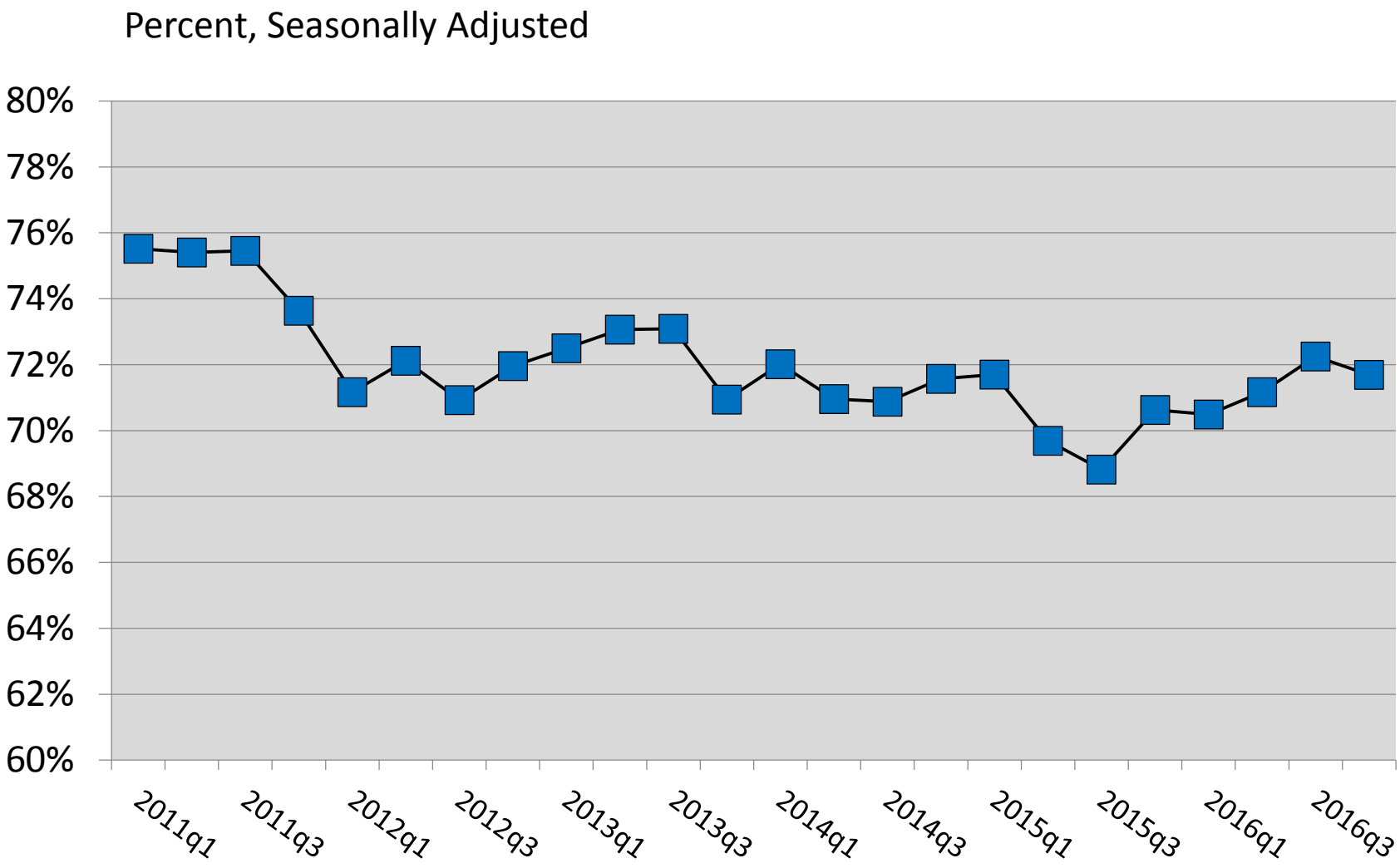
- ★ Cary, North Carolina
- ▲ New York, New York
- ▲ Mexico City, Mexico
- ▲ Shanghai, China
- ▲ Kowloon, Hong Kong
- ▲ Osaka, Japan

Cotton's Share of Women's Apparel



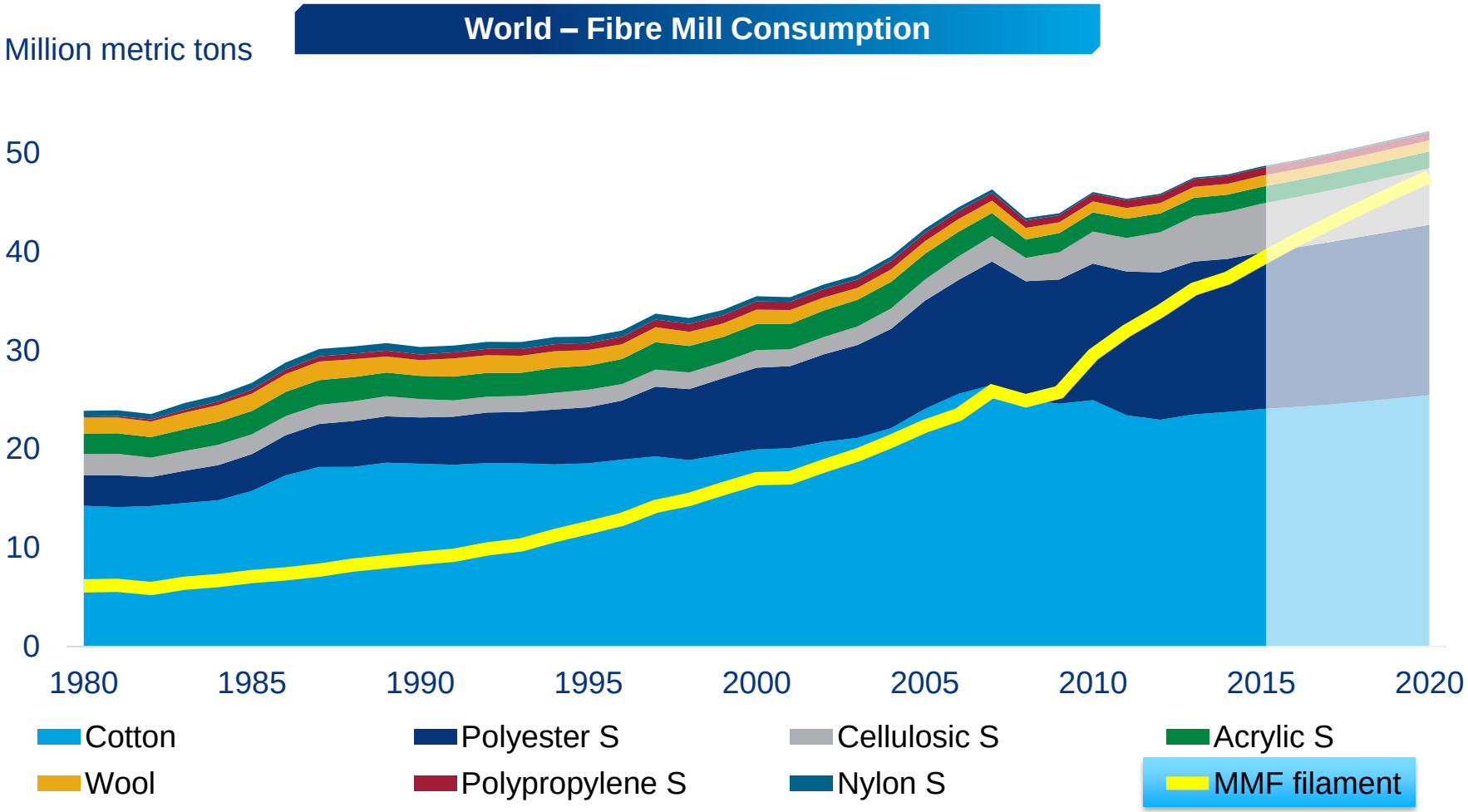
Source: *Cotton Incorporated's Retail Monitor™*

Cotton's Share of Men's Apparel



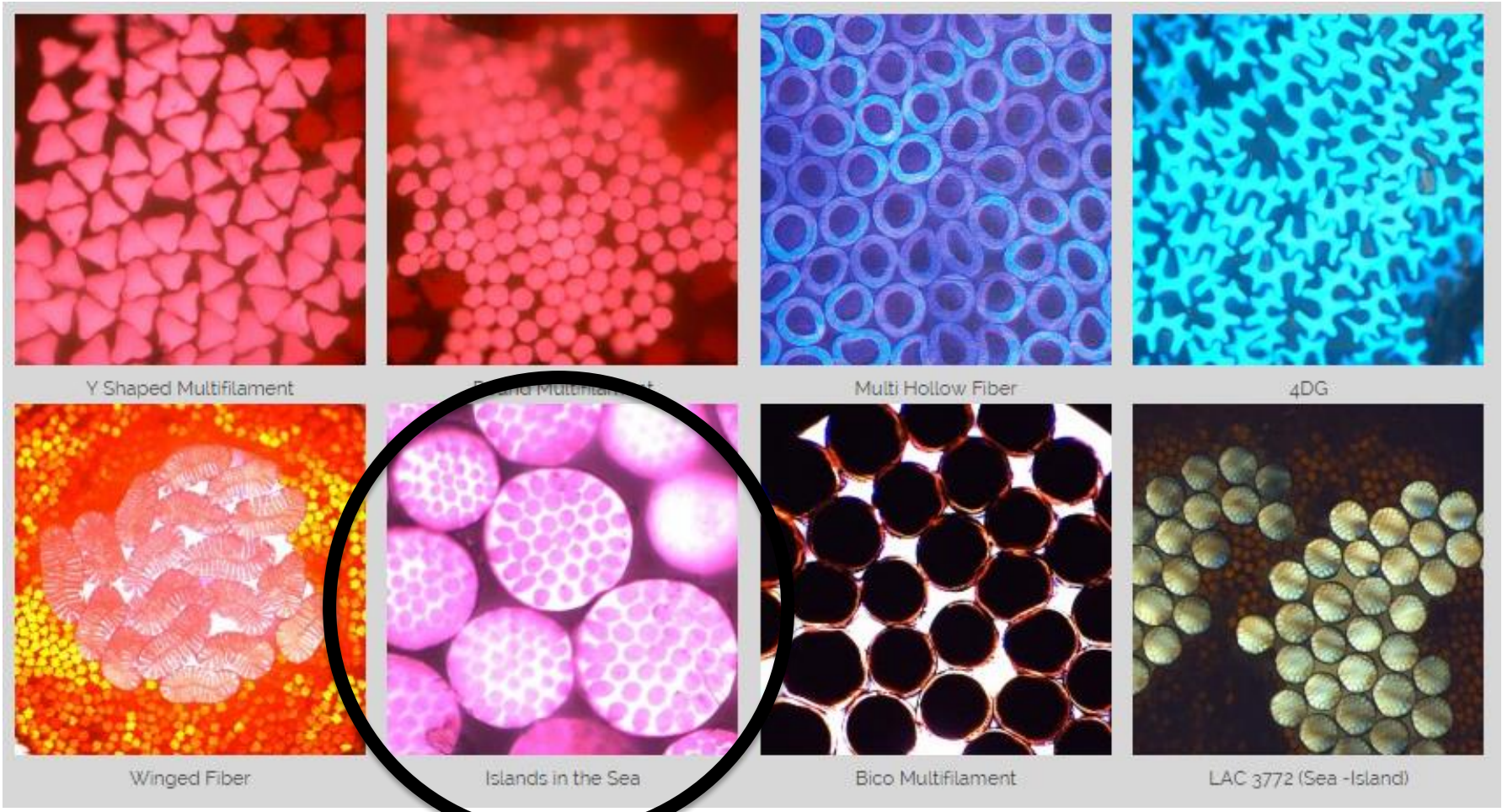
Source: *Cotton Incorporated's Retail Monitor™*

Man made filament growing faster than all staple fibers

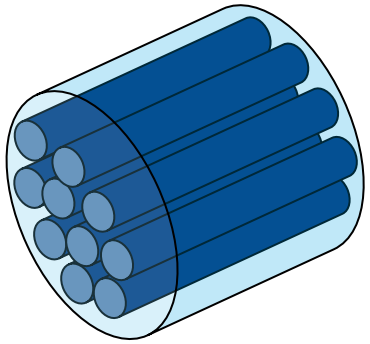


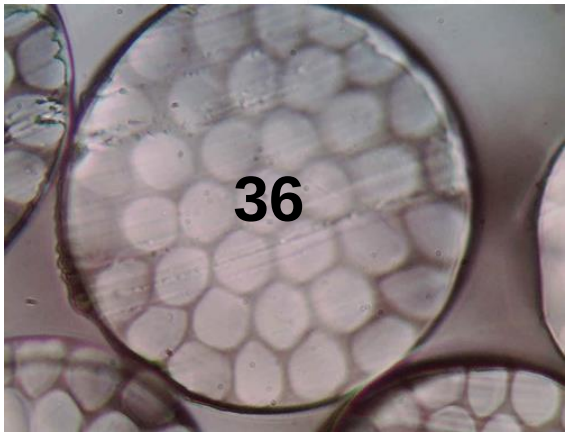
Source: PCI Wood Mackenzie Red Book 2016

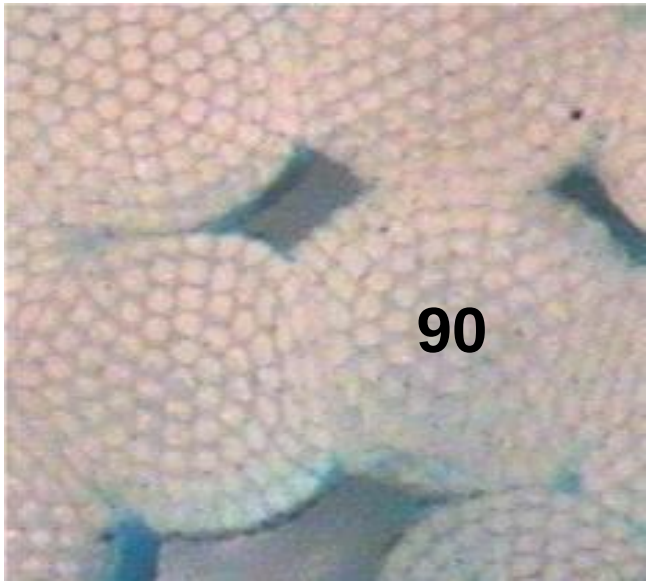
Endless Geometric Possibilities



Islands in the Sea – Splittable polyester filament







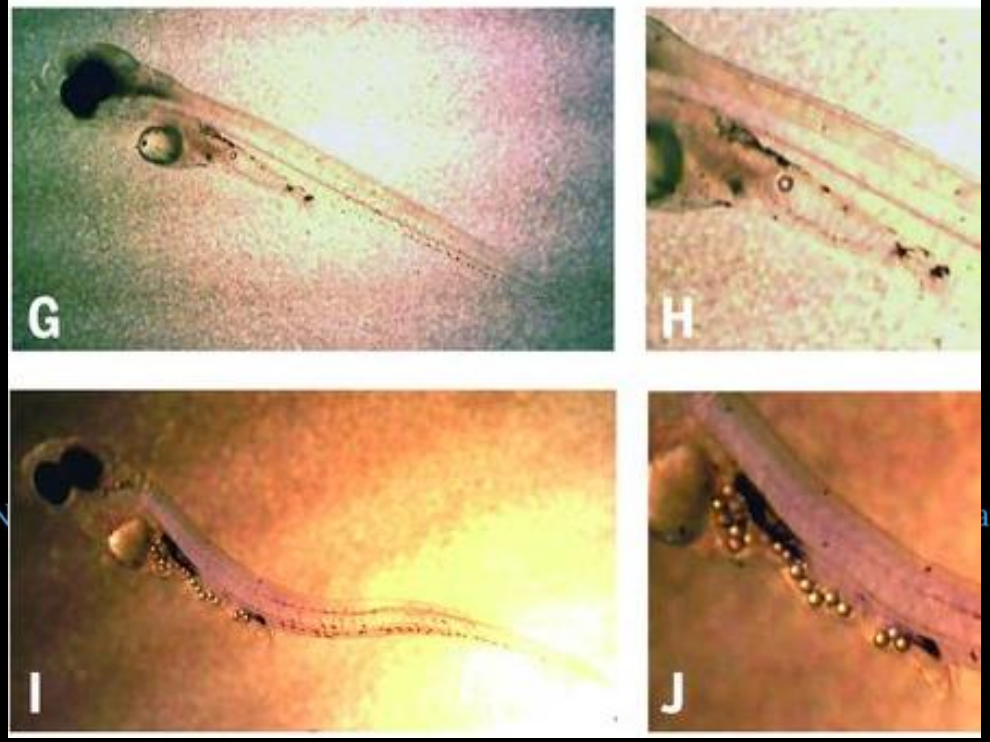
MICROFIBER POLLUTION

ECOTOXICOLOGY

Environmentally relevant concentrations of microplastic particles influence larval fish ecology

Oona M. Lönnstedt* and Peter Eklöv

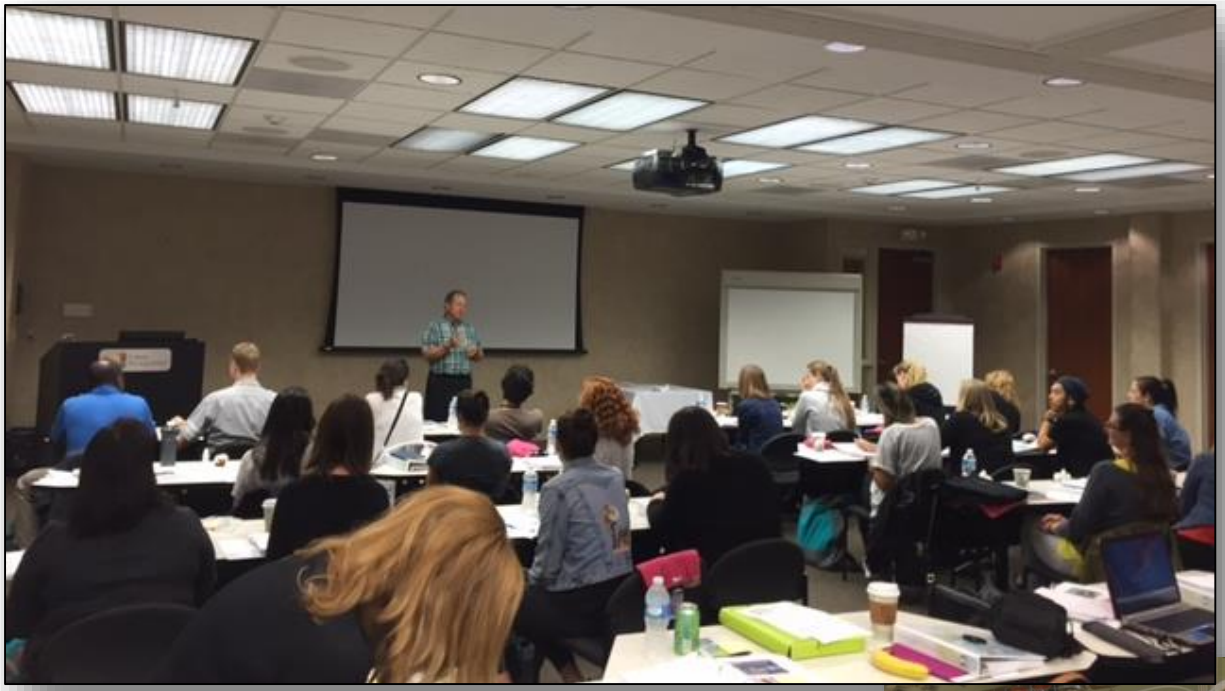
Science 2016 June 3



patagonia

BREN SCHOOL OF ENVIRONMENTAL SCIENCE & MANAGEMENT
UNIVERSITY OF CALIFORNIA, SANTA BARBARA

- Microplastic particles are shed from washing synthetic textiles
- They are ubiquitous in the ocean and on land
- They concentrate toxins (PCBs, DDT, POPs) in fish
- Have a severe impact on fish health
- Impacts on human health being investigated
- Expensive to filter out of washing machine discharge
- Synthetic functionality creates this problem



ACT·IVE™

ENHANCED | ENGINEERED | EMBELLISHED

PERFORMANCE COTTON

GROW YOUR ACTIVEWEAR BUSINESS.

MAY 3-5 | CARY, NC

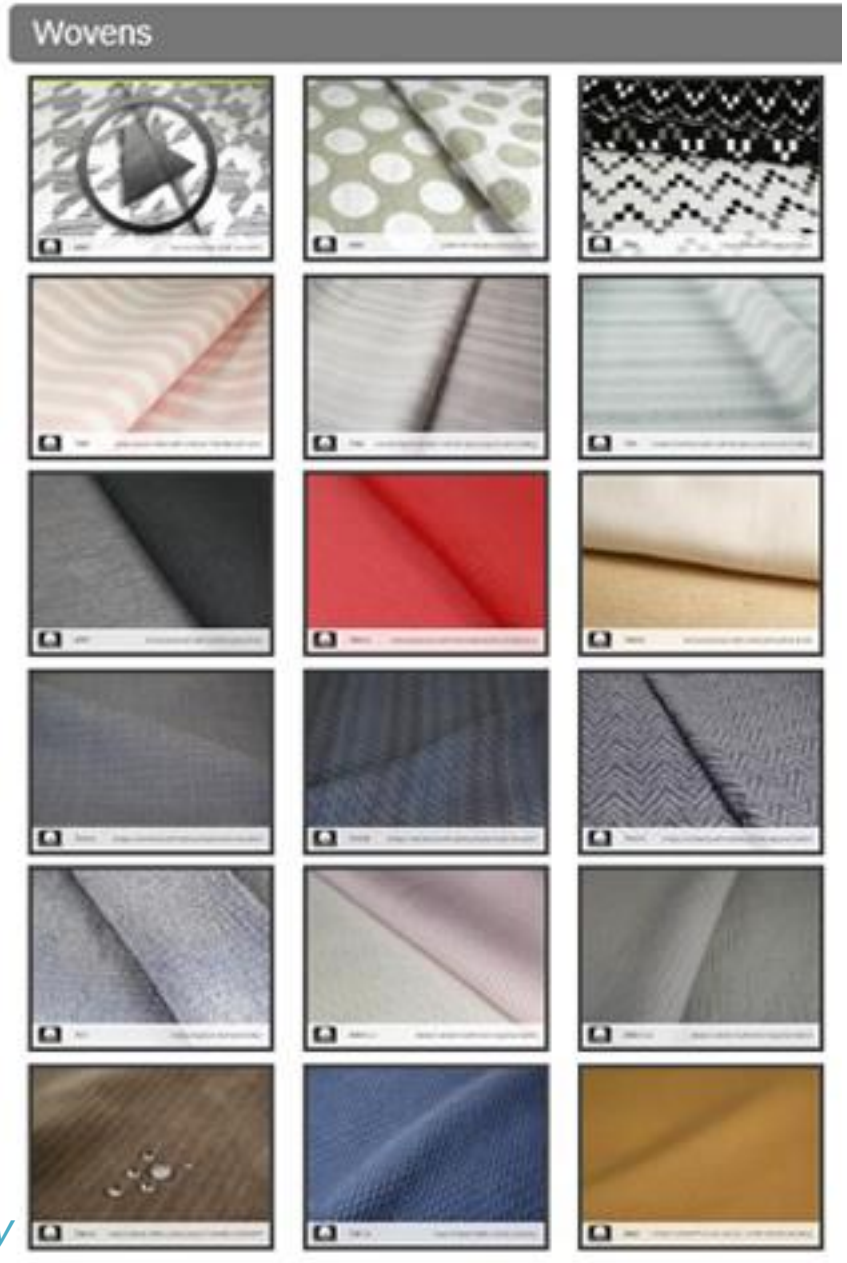
Accommodation expenses are provided.
Participation is limited.
Contact wblankinship@cottoninc.com

RSVP by APRIL 1st

ACT·IVE
enhanced·engineered·embellished

FABRIC COLLECTIONS

for Apparel & Home



122 new fabrics developed

70 Wovens | 46 Knits | 6 Bonded

KEY PRODUCT CATEGORIES

Active wear

Knit tops

Non-denim pants

Denim

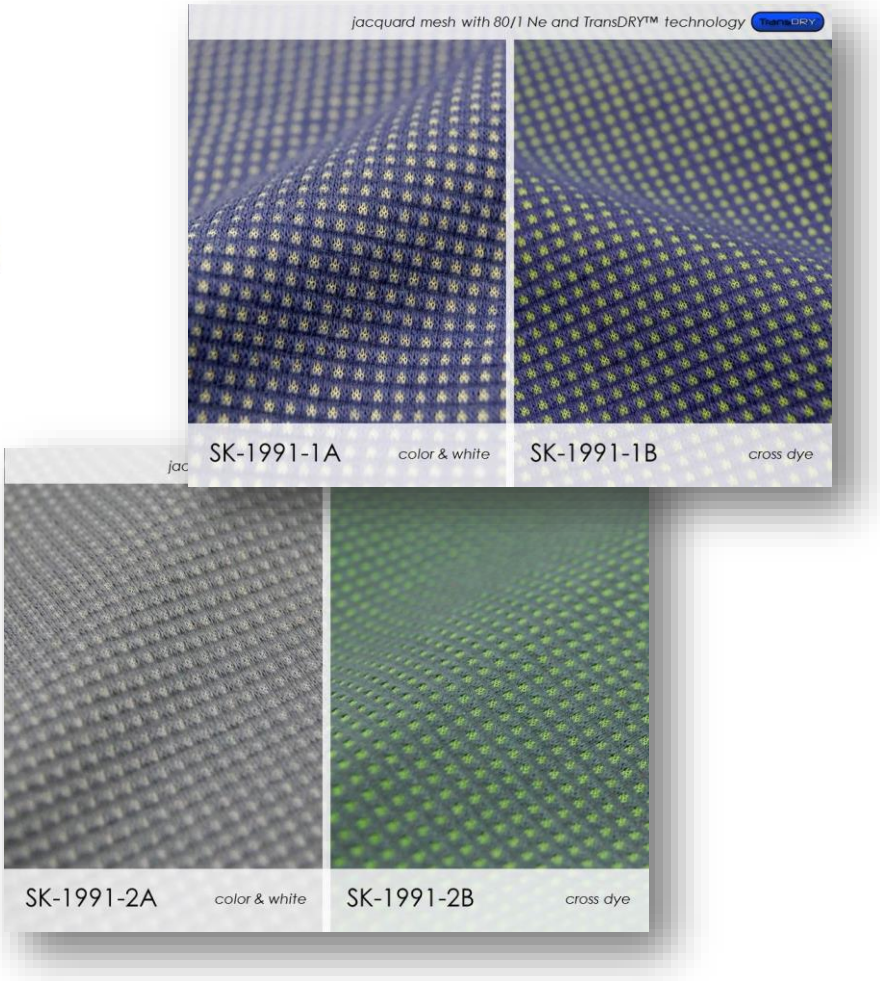
FEBRUARY 

SEPTEMBER 

New collections are released biannually

FlashDRY Cotton

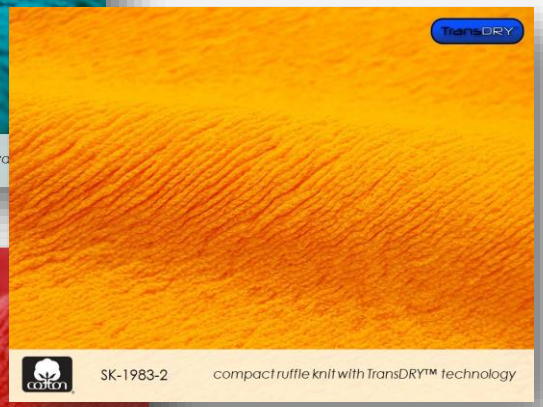
Alpine Start V-Neck Tee & Polo



THE NORTH FACE

MEN'S THERMAL COTTON FULL ZIP HOODIE

Insulating Ruffle Knit Developments




0:05 / 0:30


0:13 / 0:30

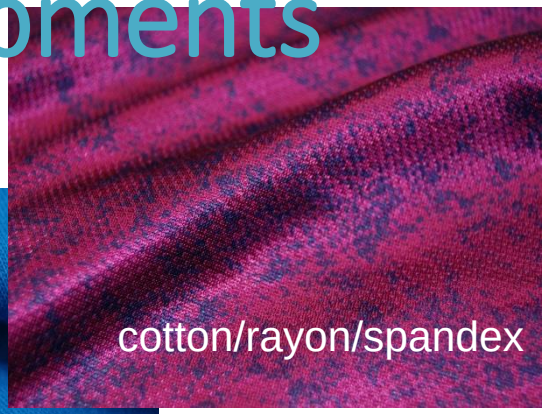

TOUGH COTTON™ WRINKLE FREE TECHNOLOGY
0:17 / 0:30

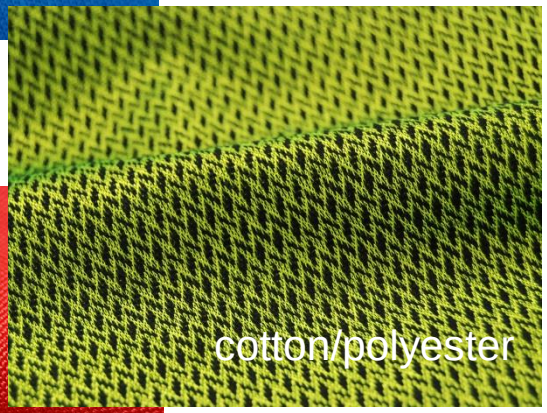

IZOD
TOUGH COTTON™
OUR NEWEST & TOUGHEST FABRIC
0:26 / 0:30

TARGET

TOUGH COTTON — FOR EXTRA DURABILITY

Blend Developments





Cotton Incorporated's Consumer Marketing Strategy

and
aggressive comparative marketing

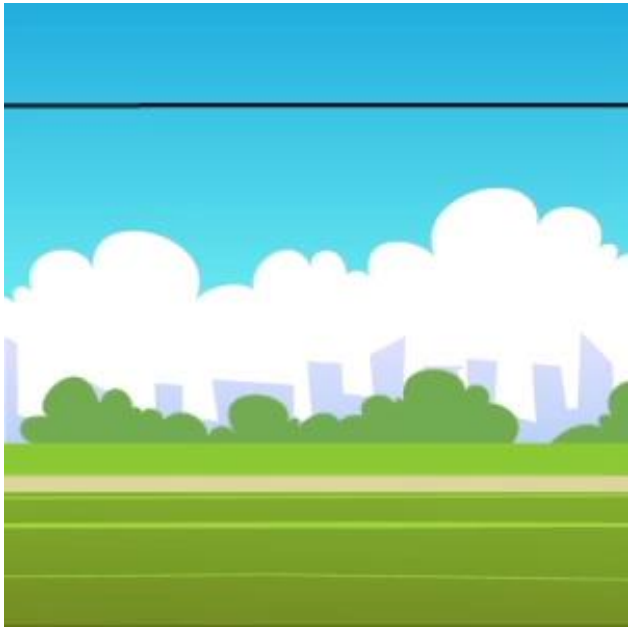
ANTHEM 2

MARY

THE DIGITAL BURST PROJECT

Concept

- Odor is a problem for synthetic activewear
- Cotton washes cleaner & smells better

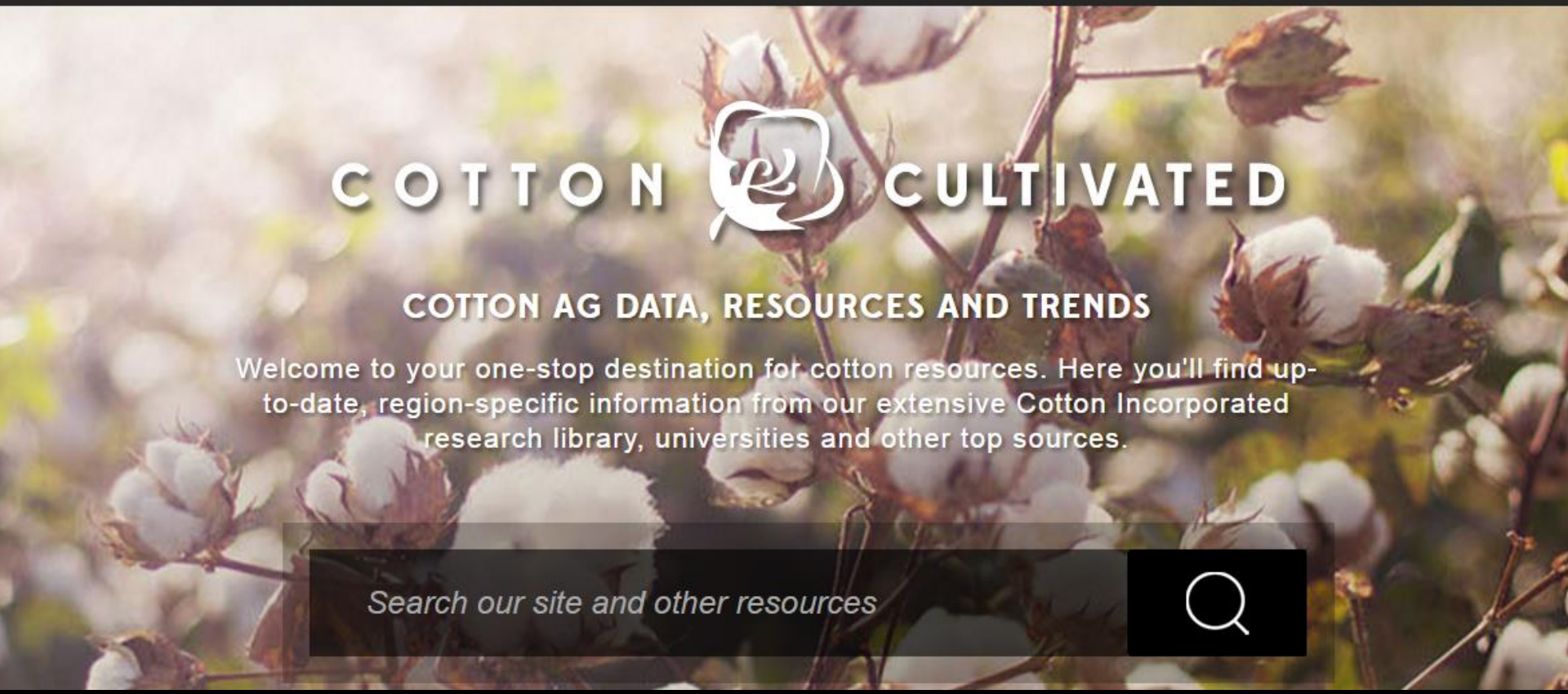


Concept

- Polyester is derived from oil
- Cotton is natural

Ag and Environmental Research

- AERD's objective is to increase grower profitability through research and outreach
- Outcomes are primarily knowledge but also include germplasm, varieties and tools
- Research portfolio is balanced to meet today's needs while preparing for future challenges
- Provide data and scientific expertise in support of Cotton's sustainability reputation, including metrics and standards


HOME
RESEARCH & REPORTS
RESOURCES DIRECTORY
HOW TO VIDEOS
ABOUT
SEARCH
COTTON CULTIVATED
COTTON AG DATA, RESOURCES AND TRENDS
Welcome to your one-stop destination for cotton resources. Here you'll find up-to-date, region-specific information from our extensive Cotton Incorporated research library, universities and other top sources.
Search our site and other resources

COTTON NEWS

NEWS | MARKET | QUALITY

Filter News by...

Cotton Farming

- Strong Cotton | SPECIAL REPORT
  January 9, 2017
- Pertinent Topics For Ginners Will B...
  January 3, 2
- Multiple Ye
  January 3, 2

SEE ALL CO

Resear

Research, rep
Cotton In

2015 Cott
Summary

Sustainability | 2016
This document provides an executive summary of the most recently complete global life cycle assessment for ...

Learn more >

SEE ALL RESEARCH & REPORTS

COTTON MULTIMEDIA

WEATHER | WEBCASTS | VIDEOS

Watch this Week's Weather Outlook

TODAY 26 JAN 17

Cary, United States

Harvest
Given the weather conditions that have challenged the southeastern United States this harvest season, suggestions for ...

Learn more >

SEE ALL RESOURCES

National

26 Jan

26 Jan

From MU
ields

26 Jan

EET

MED

SUBSCRIBE

COTTON NEWS

NEWS | MARKET | QUALITY

Filter News by...

Cotton Farming

- Strong Cotton | SPECIAL REPORT
  January 9, 2017
- Pertinent Topics For Ginners Will B...
  January 3, 2017
- Multiple Year/Location Data = Pric...
  January 3, 2017

SEE ALL COTTON FARMING ARTICLES

COTTON MULTIMEDIA

WEATHER | WEBCASTS | VIDEOS

Natural Resource Survey

Stinkbug Management

SEE ALL HOW TO VIDEOS

National

CULTIVATED TWEETS

27 Jan
@Crop_Protection
News: Incorporating #Soil Health Into Your Farming Mantra https://t.co/wW2hYTexft

26 Jan
@CottonGrowerMag
Bayer Offers Shared Risk Program for FiberMax, Stoneville Growers https://t.co/gvOwLYiuPt #cotton

26 Jan
@CottonGrowerMag

COMPOSE NEW TWEET

Research and Reports

Research, reports and other materials from Cotton Incorporated's rich library

2015 Cotton LCA Executive Summary

Sustainability | 2016
This document provides an executive summary of the most recently complete global life cycle assessment for ...

Learn more >

SEE ALL RESEARCH & REPORTS

Resources Directory

Trusted resources that we find useful and think you will, too

Handling Cotton Exposed to Excessive Rainfall

Harvest
Given the weather conditions that have challenged the southeastern United States this harvest season, suggestions for ...

Learn more >

SEE ALL RESOURCES

STAY INFORMED

Email

SUBSCRIBE

HOW TO VIDEOS

FILTER BY REGION

ALL | FAR WEST | MIDSOUTH | SOUTHEAST | SOUTHWEST

FILTER BY TOPIC

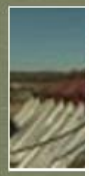
ALL | HARVEST | INSECT MANAGEMENT | MAINTENANCE | SUSTAINABILITY

Cotton Harvest Information:

Make sure you are ready for harvest with guides on the efficient operation of pickers and strippers as well as tips on the proper storage of seed cotton

National

Natur



In Se

In Seaso

Preseason Procedures

Preseason Procedures

Preseason Procedures

Fire Prevention

In Season Procedures Harvesting

COTTON NEWS

NEWS | MARKET | QUALITY

Filter News by...

Cotton Farming

- Strong Cotton | SPECIAL REPORT
  January 9, 2017
- Pertinent Topics For Ginners Will B...
  January 3, 2017
- Multiple Year/Location Data = Pric...
  January 3, 2017

SEE ALL COTTON FARMING ARTICLES

COTTON MULTIMEDIA

WEATHER | WEBCASTS | VIDEOS

Focus on Cotton

- Management of Tarnished Plant Bugs...
  January 3, 2017
- Glyphosate-Resistant Johnsongrass...
  November 29, 2016
- What Does it Cost to Choose the Wro...
  November 29, 2016
- Target Spot of Cotton - Six Years Afte...
  October 31, 2016
- Changing Bt Technologies and Bollwo...
  October 4, 2016
- Impact of Leaf Pubescence on Fiber...
  October 4, 2016

SEE ALL FOCUS ON COTTON WEBCASTS

Research and Reports

Research, reports and other materials from Cotton Incorporated's rich library

2015 Cotton LCA Executive Summary

Sustainability | 2016

This document provides an executive summary of the most recently complete global life cycle assessment for ...

Learn more >

SEE ALL RESEARCH & REPORTS

Resources Directory

Trusted resources that we find useful and think you will, too

Handling Cotton Exposed to Excessive Rainfall

Harvest

Given the weather conditions that have challenged the southeastern United States this harvest season, suggestions for ...

Learn more >

SEE ALL RESOURCES

National

CULTIVATED TWEETS

27 Jan
@Crop_Protection
News: Incorporating #Soil Health Into Your Farming Mantra https://t.co/wW2hYTexft

26 Jan
@CottonGrowerMag
Bayer Offers Shared Risk Program for FiberMax, Stoneville Growers https://t.co/gvOwLYiuPt #cotton

26 Jan
@CottonGrowerMag

COMPOSE NEW TWEET

STAY INFORMED

Email

SUBSCRIBE

Back to Focus on Cotton

What Does it Cost to Choose the Wrong Cotton Variety?

December 2016

By Guy D. Collins, Ph.D.
Associate Professor
Extension Cotton Specialist
North Carolina State University
Phone: 919-515-2647
Email:gdcollin@ncsu.edu

Watch Presentation (25 min 04 sec)

for PC, Mac, and Mobile Devices | **for iPhone**

Subscribe to PMN

Summary: This presentation will help growers as well as county agents, consultants, and industry personnel from all cotton producing states gain a better understanding of the potential economic impact of poor cotton variety selection. Specifically in this presentation, practitioners will learn the real impact of making poor variety decisions and what to expect when doing so. Additionally they will learn how various degrees of error vary in terms of economic impact. By the end of this presentation, growers will completely understand the importance of careful variety selection and how to go about the variety selection process while avoiding or minimizing error, therefore improving their ability to capture additional profit in modern cotton varieties.

Guy D. Collins, Ph.D.
Extension Cotton Specialist, North Carolina State...
More info

Menu

Search...

What Does it Cost to Choose the Wrong Cotton Variety?

nc cotton PRODUCERS ASSOCIATION since 1954

N.C. DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES - FOUNDED 1877 -

NC STATE UNIVERSITY

Guy D. Collins, Ph.D.
NCSU Cotton Extension Associate Professor
Keith L. Edmisten, Ph.D
NCSU Professor and Extension Cotton Specialist

Guy D. Collins, Ph.D.
Extension Cotton Specialist, North Carolina State...
More info

Menu

Search...

Impact on your farm

Using the smallest degree of error and the currently low cotton prices of $0.65/lb….

- **A 1500-acre producer could lose $99,000 to $135,000 in potential revenue to make a SMALL mistake**
- **These cost drastically increase for higher degrees of error, and these methods are common**
- **For $0.80/lb prices, these figures inflate by 25 %!!**

FOCUS ON COTTON
Plant Management Network

Dale Logan
Manager, SeedMatrix

More info

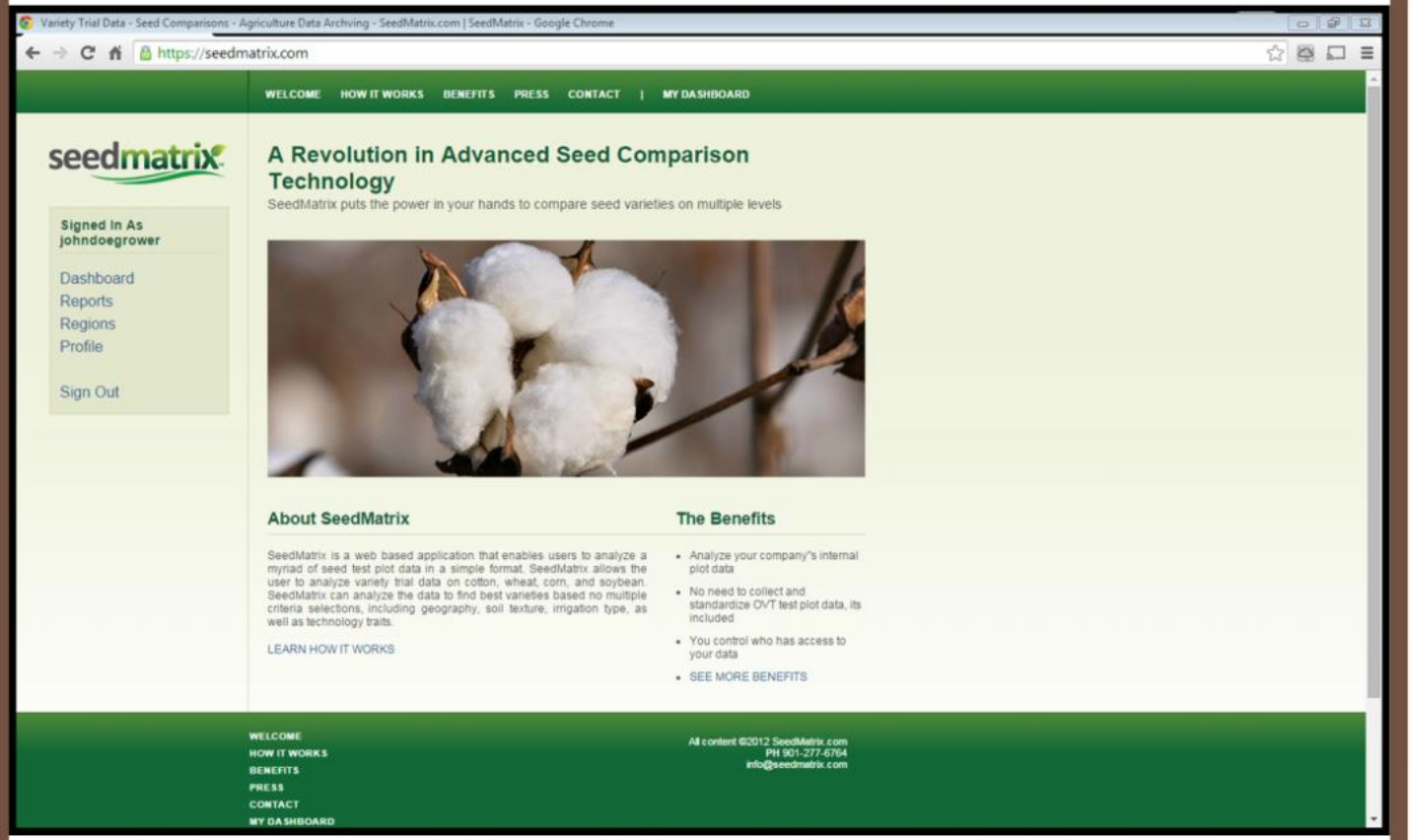
Menu

Search...

SeedMatrix.com (00:00 / 15:41)

Resources

SeedMatrix.com



PREV NEXT

Seedmatrix: Find your most profitable variety

Dashboard Reports Regions Profile **Help me with this page!** Sign Out [Kater Hake]

Cotton

Single Trial Data | Top Performing Products | **Head to Head Comparison** | One to Many Comparison

Head to Head Comparison

◉Compare Products ○Compare Companies

Company: Delta Pine ▾ Product: ▾ Add To Comparison

Customize the columns displayed

Tests: 19|14 2015: 19|14 Columns ✖ Remov

Filters Year (1) ☐ All ☑ 2015 ☐ 2014 ☐ 2013 ☐ 2012 ☐ 2011 ☐ 2010 ☐ 2009 ☐ 2008 ☐ 2007 ☐ 2006 ☐ 2005

Head to Head Results | Trials By State | Trials Within States | Benchmark Comparison | Product Details | Dual Axis Chart | Sc

Company	Product	Trait	All Trials		Trials with Fiber Data				
			Yield	Turnout	Yield	Turnout	Staple	Strength	Mic
Delta Pine	DP 1518 B2XF	B2XF	1,235	41.9%	1,159	42.3%	36.5	29.3	4.37
Delta Pine	DP 0912 B2RF	B2RF	1,203	40.4%	1,142	40.5%	34.4	29.9	4.89

Trials with Fiber Data

Yield	Turnout	Staple	Strength	Mic	Unif	$/LB	$/Acre
1,159	42.3%	36.5	29.3	4.37	83.3%	$0.5328	$621.26
1,142	40.5%	34.4	29.9	4.89	82.6%	$0.5080	$583.28

Plant Management Network

Science-Based Agricultural Resources

Brought to you by
The American Phytopathological Society
American Society of Agronomy
Crop Science Society of America

Journal

Journal

Journal

Journal

Journal

Webcasts

Webcasts

Webcasts

Webcasts

Webcasts

News

Efficacy Trials

Efficacy Trials


Proceedings


Image Database

FOCUS ON COTTON

Enhancing the Health, Management, and Production of Cotton Crops

Educational Webcasts

RSS Feed

Latest Webcasts

- **Resistant Weeds: What You Should Know and Why You Should Care** - Todd A. Baughman, Oklahoma State University, February 2017.
- **Management of Tarnished Plant Bugs in Cotton** - Jeff Gore, Mississippi State University, January 2017.

FOCUS ON COTTON
Plant Management Network

George G. Kennedy, Ph...
Professor of Agriculture, North Carolina State...
More info

Menu

Search...

Thrips Infestation Predictor for Cotton: An Online Tool for Informed Thrips Management

http://climate.ncsu.edu/cottonthripsrisk

NC STATE UNIVERSITY
George G. Kennedy, Thomas M. Chappell, and Anders S. Huseth
North Carolina State University

PREV NEXT

FOCUS ON COTTON
Plant Management Network

Peter C. Ellsworth, Ph.D.
Specialist/Professor, IPM, University of Arizona
More info

Menu | Notes

Search...

Plant Management Network & Cotton Incorporated
Focus on Cotton Webcast

Whitefly Management & Prevention of Excess Sugars in Cotton

Peter C. Ellsworth, Tim Vandervoet, Lydia M. Brown, Al Fournier & Steven E. Naranjo*

Arizona Pest Management Center

Department of Entomology
University of Arizona

THE UNIVERSITY OF ARIZONA
COLLEGE OF AGRICULTURE AND LIFE SCIENCES
COOPERATIVE EXTENSION
Arizona Pest Management Center

ARIZONA PEST MANAGEMENT CENTER

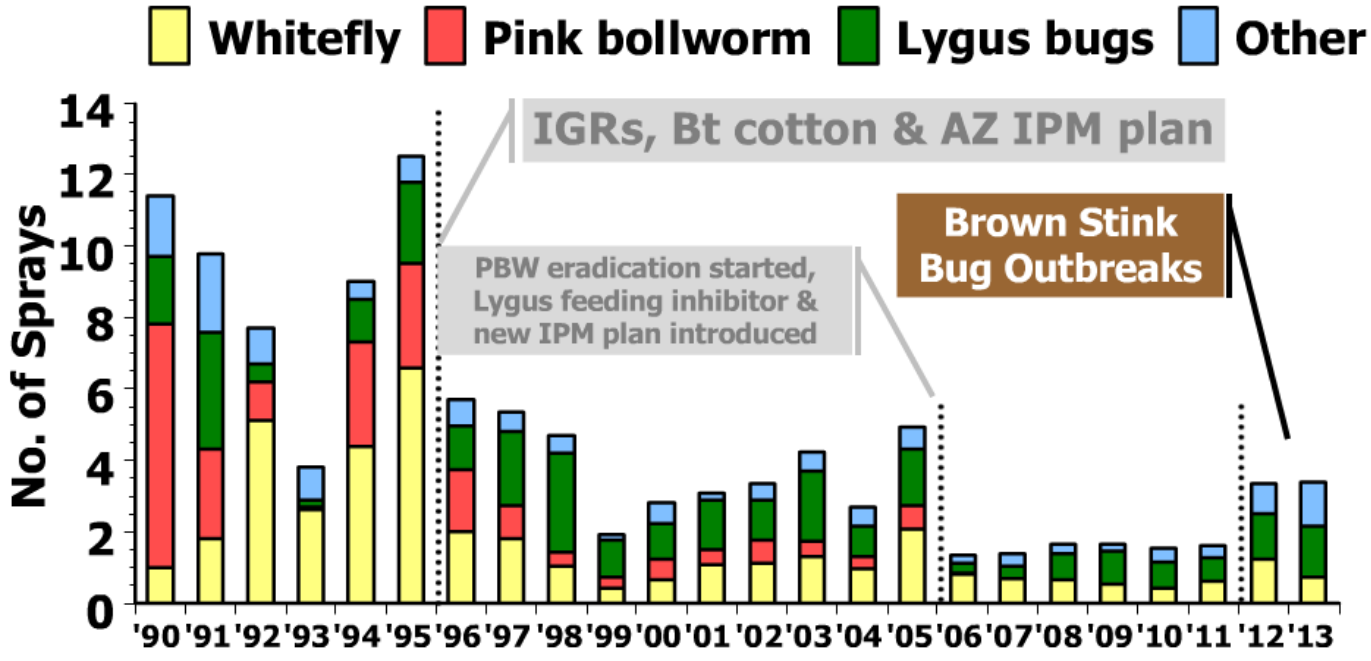
Plant Management Network International

cotton

PREV NEXT

Peter C. Ellsworth, Ph.D.
Specialist/Professor, IPM,
University of Arizona
More info

Disruptive Influence of Stink Bugs



Ellsworth et al. 2/14

FOCUS ON COTTON
Plant Management Network

Peter C. Ellsworth, Ph.D.
Specialist/Professor, IPM,
University of Arizona
More info

Menu | Notes

Search...

FOCUS ON COTTON
Plant Management Network

Jeff Gore, Ph.D.
Assistant Professor,
Mississippi State University
More info

Menu

Search...

PREV NEXT

FOCUS ON COTTON

Plant Management Network

Jeff Gore, Ph.D.
Assistant Professor,
Mississippi State University
More info

Menu

Search...

Management of Tarnished Plant Bugs in Cotton (10:39 / 33:52)

Resources

PREV NEXT

FOCUS ON COTTON
Plant Management Network

Seth Byrd, Ph.D.
Extension Cotton Specialist, Texas A&M University...
More info

Menu

Search...

TEXAS A&M AGRILIFE EXTENSION

Beltwide Evaluation of the Effect of 2,4-D Drift on Cotton

Seth A. Byrd
Extension Cotton Specialist
Texas A&M AgriLife Extension

Guy D. Collins, A. Stanley Culpepper, Keith L. Edmisten, Darrin M. Dodds, David L. Wright, Gaylon D. Morgan, Paul A. Baumann, Peter A. Dotray, Andrea S. Jones, Misha R. Manuchehri , Timothy L. Grey, Theodore M. Webster, Jerry W. Davis, Jared R. Whitaker, John L. Snider, Phillip M. Roberts, and Wesley M. Porter

Seth Byrd, Ph.D.
Extension Cotton Specialist, Texas A&M University...
More info

Conclusions

- The tank contamination rate treatment accounted for the majority (75%) of instances of yield loss.
- Growth stages 9-lf, FB, and FB+2 wk were the most sensitive to 2,4-D applications in terms of yield loss compared to NTC.
- Visual injury ratings did not reflect yield loss at the most sensitive growth stages.

FOCUS ON COTTON
Plant Management Network

Glen Ritchie, Ph.D.
Assistant Professor, Texas Tech University, Texas A&M
More info

Menu

Search...

Cotton Response to Stress

Glen Ritchie

Texas Tech University / Texas A&M AgriLife Research

Texas A&M AgriLife Research

Plant Management Network

Glen Ritchie, Ph.D.
Assistant Professor, Texas Tech University, Texas A&M
More info

Menu

Search...

Water Deficit Timing and Lint Yield

Environment	Squaring	Early Flowering	Late Flowering	Full Irrigation	LSD_{Irr}
	Lint Yield (kg ha^{-1})				
2011	1215 b	564 d	1101 c	1525 a	84
2012 Loc. 1	1339 b	841 d	1164 c	2059 a	122
2012 Loc. 2	1759 b	876 d	1271 c	2180 a	86
$Mean_{Irr}$	1438 B	760 D	1179 C	1921 A	132

Adapted from Snowden et al. 2014

FOCUS ON COTTON

Plant Management Network

Syam K. Dodla, Ph.D.
Assistant Professor,
Louisiana State University
More info

Menu

Search...

Sulfur Fertilization of Cotton (00:04 / 12:49)

Resources

Sulfur Fertilization of Cotton

Syam K. Dodla
Assistant Professor of Soil Fertility and Crop Irrigation
Red River Research Station
Louisiana State University AgCenter
Bossier City, LA

Plant Management Network

innovate . educate . improve lives

for the latest research-based information on just about anything, visit our Web site: www.lsuagcenter.com

LSU AgCenter Research & Extension

PREV NEXT

FOCUS ON COTTON
Plant Management Network

Syam K. Dodla, Ph.D.
Assistant Professor,
Louisiana State University
More info

Menu

Search...

Sulfur Deficiency Symptoms in Cotton

Adopted from: Yin et al., 2012, Uni. Of Tennessee

- Yellowing of younger leaves
- Stunted growth
- Fewer and smaller bolls
- Reduced root growth

Robert C. Kemerait, Jr.,...
Professor and Extension Specialist, University of...
More info

Menu

Search...

TARGET SPOT OF COTTON

Six years after first report

Part 1

Dr. Bob Kemerait, Dr. Marin Brewer, Ms. Leilani Sumabat and Dr. Austin Hagan
Dept. of Plant Pathology and Dept. of Entomology and Plant Pathology
University of Georgia and Auburn University

Plant Management Network

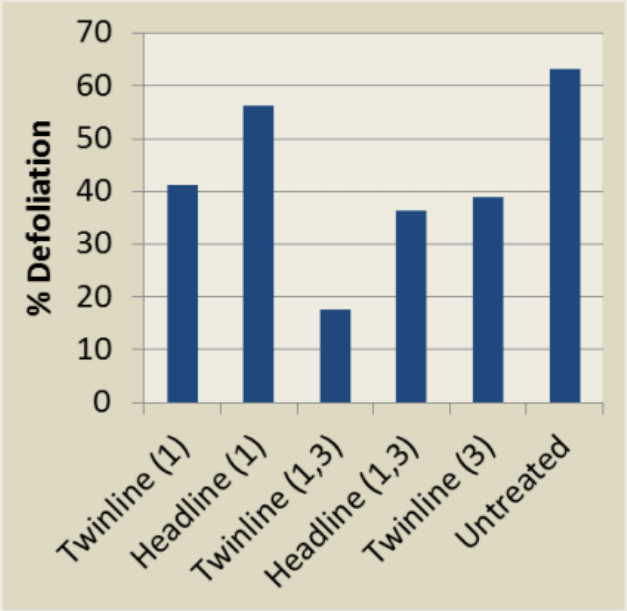
Robert C. Kemerait, Jr.,...
Professor and Extension Specialist, University of...
More info

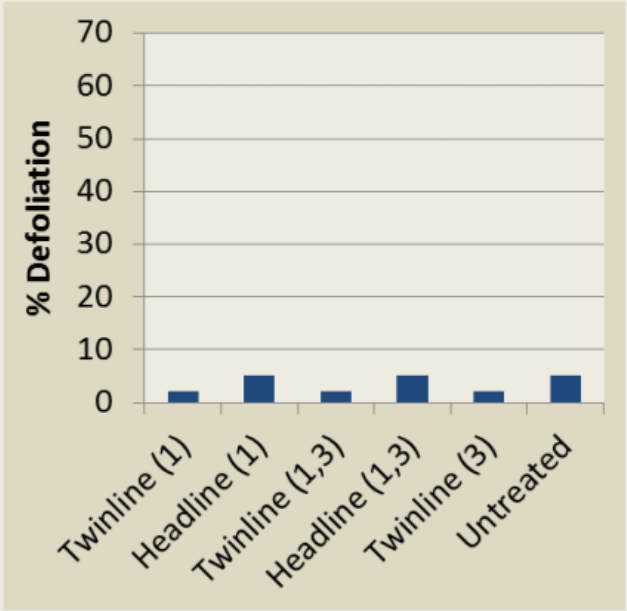
Menu

Search...

2012 Stripling Irrigation Park, Mitchell County

Target Spot





COTTON CULTIVATED

http://cottoncultivated.cottoninc.com

News Customized Twitter & news feeds

Weather Up-to-the-minute & local

Research 40 years of research dedicated to advancing cotton: searchable by topic or region.

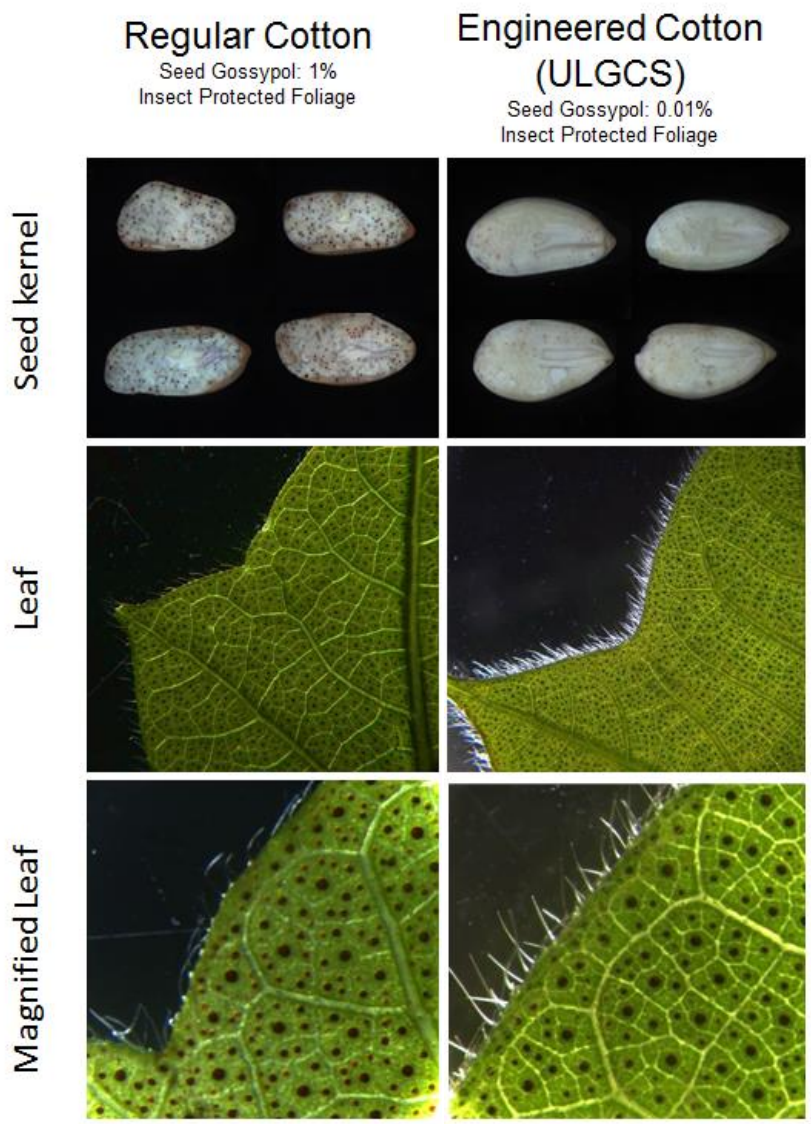
Resources Useful, trusted sources on a variety of cotton topics: searchable by topic or region

Your one-stop destination for *grower information*

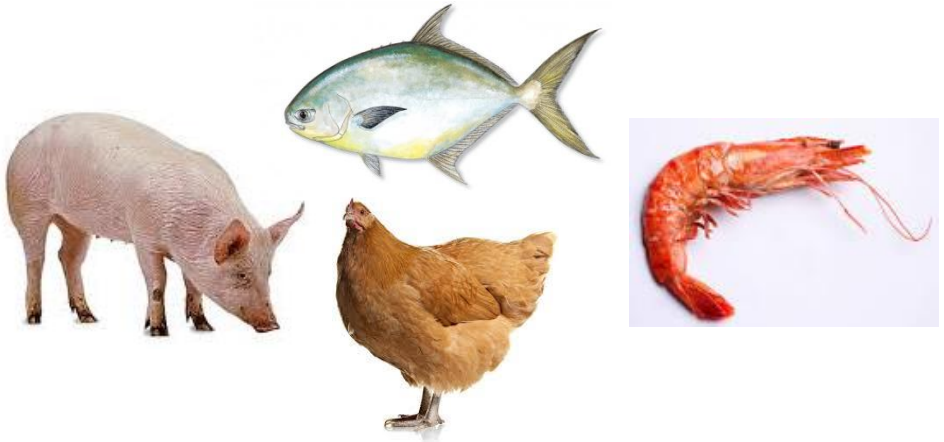
Expanding Cotton's Boundaries through Gene Editing and Engineering

Kater Hake
VP Ag & Env Research
Cotton Incorporated

Expand cotton's use as a food crop



Removing gossypol from just the cottonseed opens up feed for aquaculture, swine and poultry:



- Provides cooking oil, multi-functional feed and a protein rich food from the local gin
- Texas A&M University developed
- U.S. regulatory approval on track for 2017 submission

PNAS 2006 Rathore

Expand Cotton's Sustainability
(PTXD phosphite weed suppression)

$PO_3 \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow PO_4$
(4 to 12 months naturally in soil)

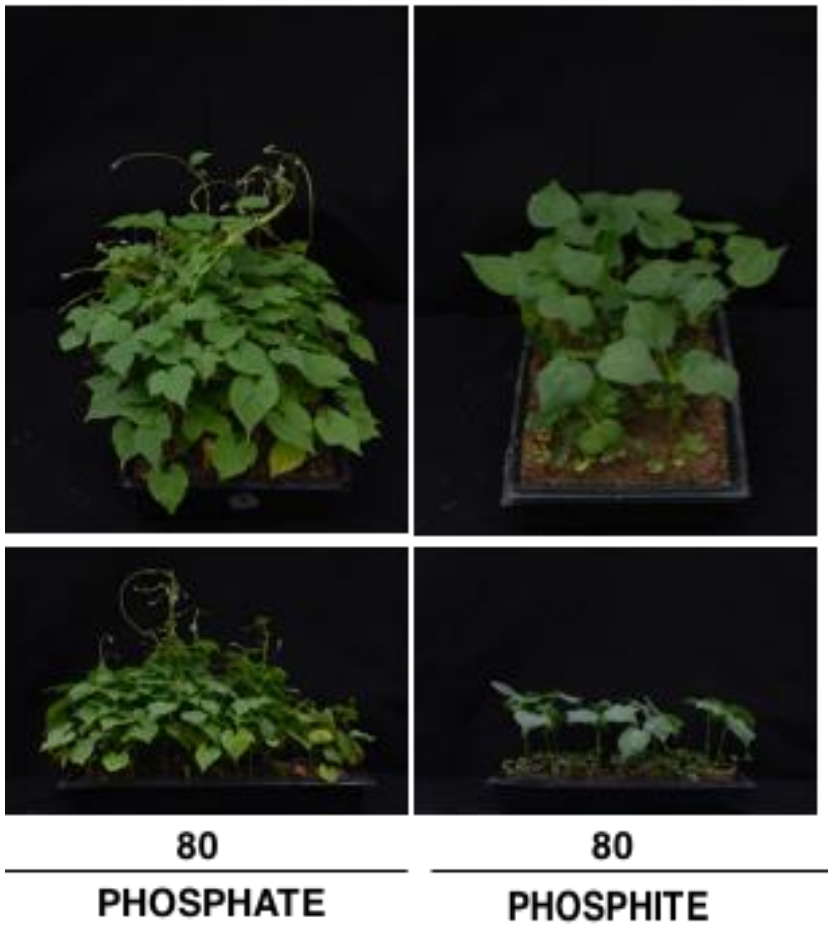
$PO_3 \rightarrow PO_4$
(minutes in PTXD plants)

$PO_3 \not\rightarrow PO_4$
(never in weeds and non-PTXD crops)

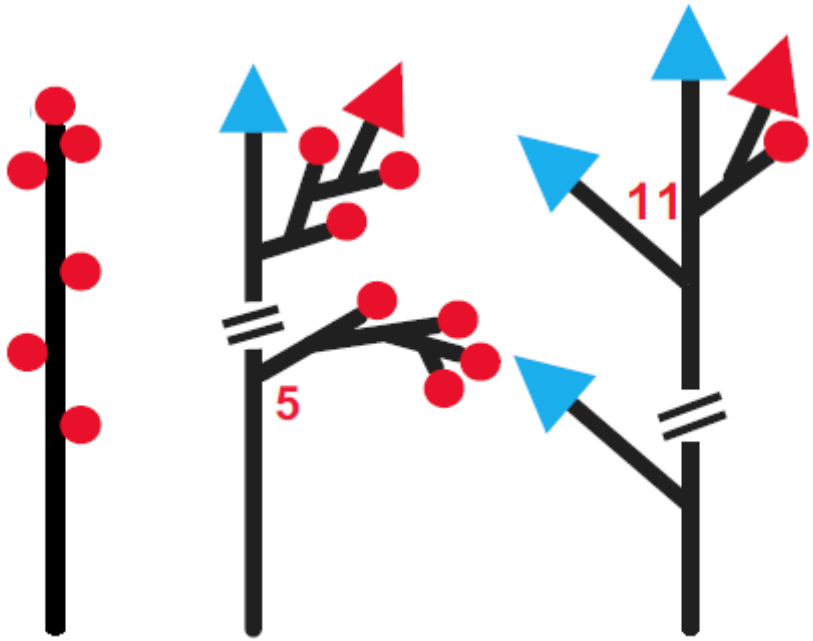
PO_3 binds to PO_4 weed receptors
(weeds "think" plenty of P while starving for P)

Provides broad spectrum weed suppression, reduced P fertilizer input and reduced water quality degradation

PTXD cotton and morning glory weeds



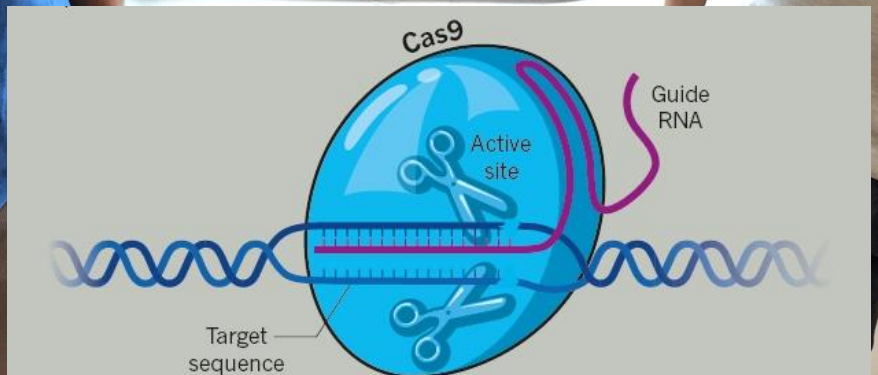
Expand Cotton's Efficiency & Quality



New Phytologist 2016 212:244-258
PNAS 2017 114(1):E57-E66

Genome Editing with CRISPR
What is it?

Plant Molecular Biology 2017 (*Baohong Zhang*)
Scientific Reports 2017 (*Keerti Rathore*)



Genome Editing with CRISPR
What does it do?

Scientific Reports 2017

Genome Editing with CRISPR
Where are we?

- Crops created from deletion are not regulated
  - DuPont corn with high value cornstarch using CRISPR
  - Penn State anti-browning mushroom using CRISPR
- Crops created from Genome Edited inserts have not been assessed for regulatory requirements
  - DuPont scientist claims 10,000 to 15,000 base pair insertion with CRISPR

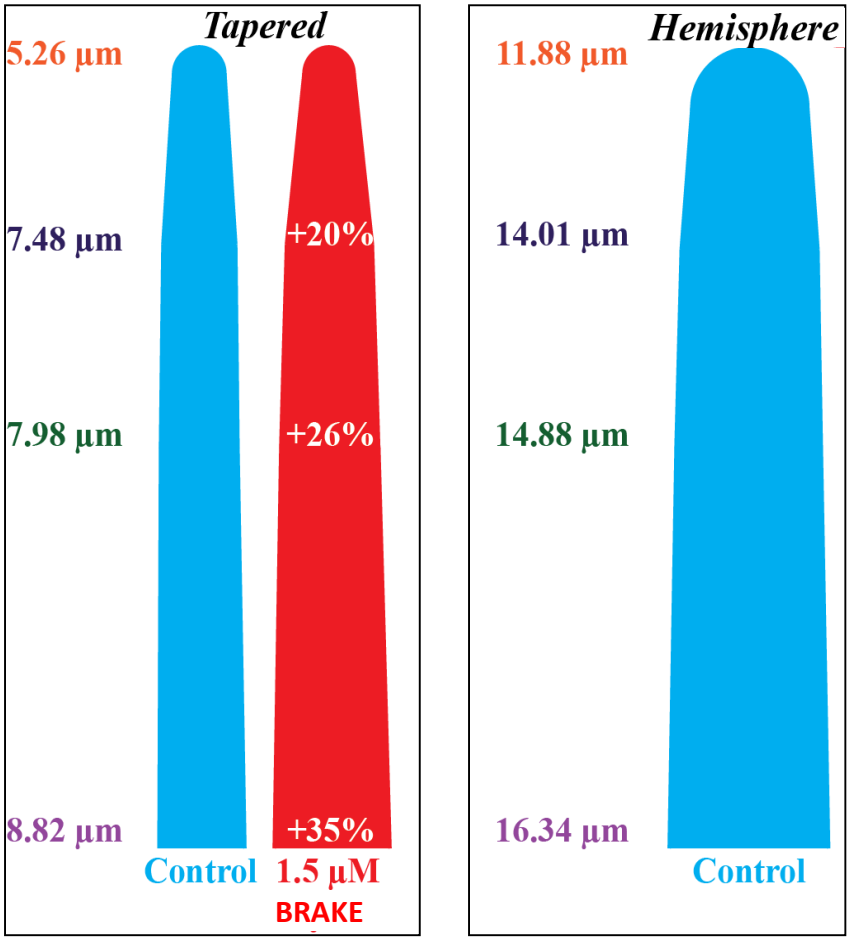
www.aphis.usda.gov/aphis/ourfocus/biotechnology/am-i-regulated
https://aaas.confex.com/aaas/2017/webprogram/Paper20737.html

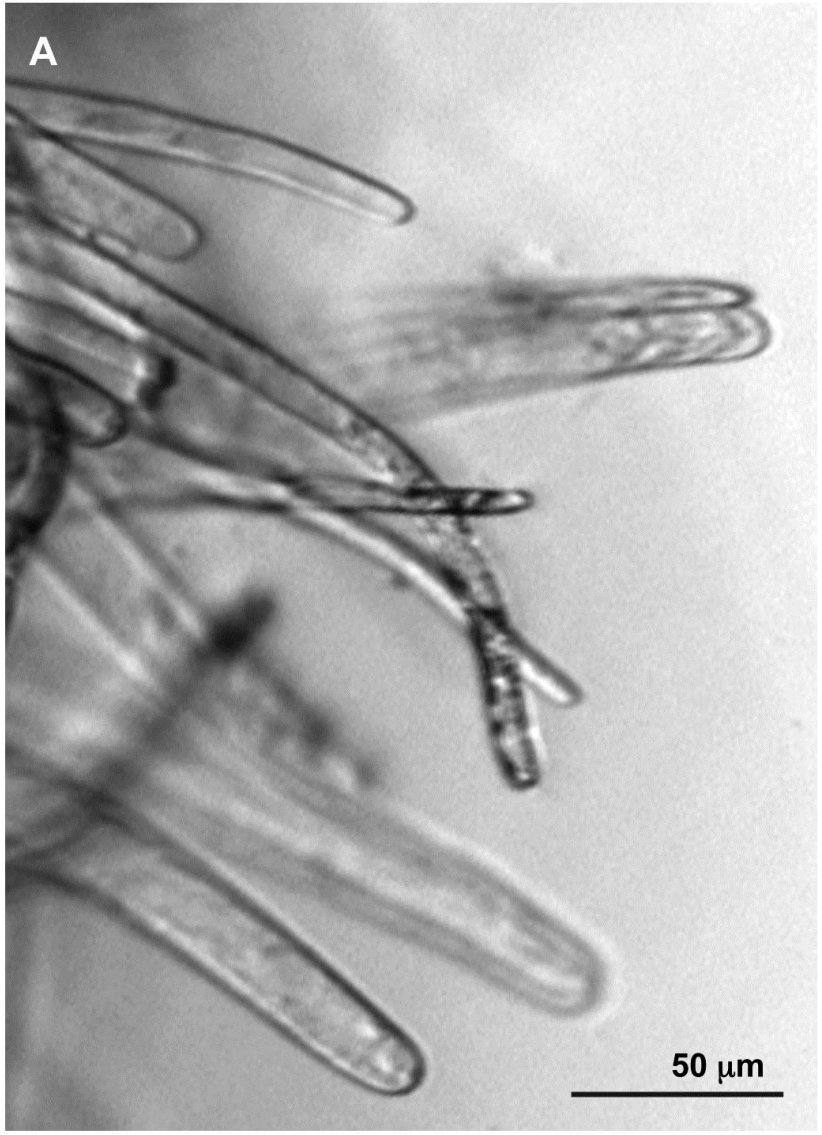
Genome Editing with CRISPR
What are the Sustainability implications?

- Likely most (all?) future biotech traits will be Genome Edited because site specific nature reduces cost and improves predictability
- US regulatory process currently clear for base pair deletions, but uncertain for insertions
- Global regulatory discussions ongoing, next 2 years informative
- Consumers **MAY** be more acceptive
- **WILL** broaden diversity of genome edited crops and of traits in current biotech crops

Expand Fiber Quality (with genome editing)

"Hang a Pima fiber on an Upland seed"

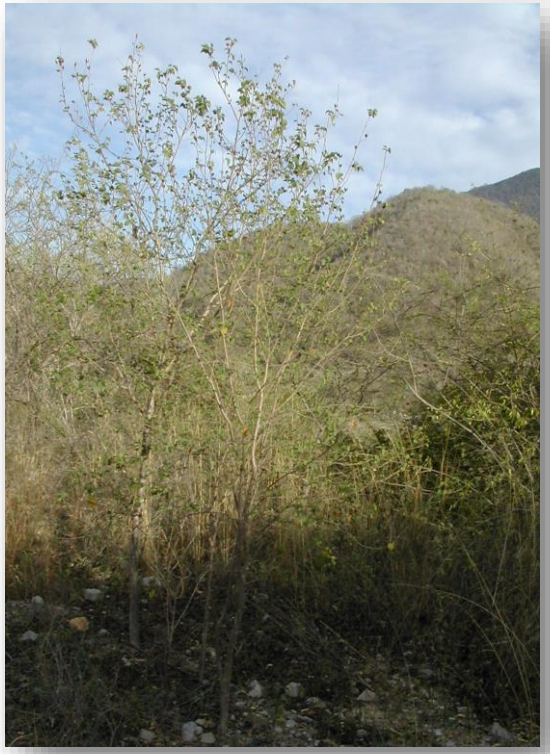




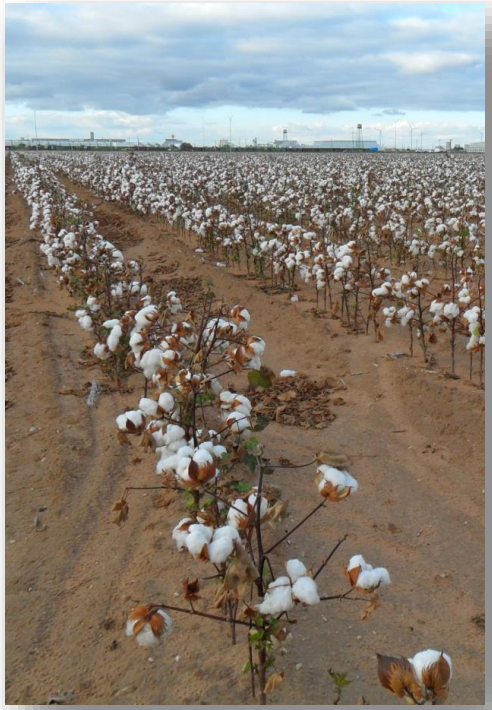
Haigler 2016 research report

Haigler 2014 research report

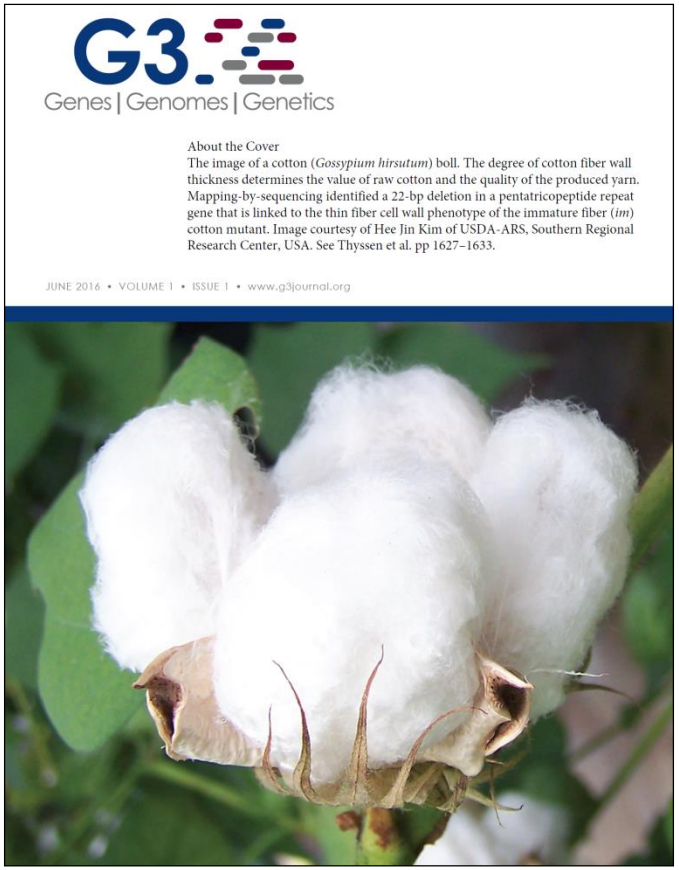
Expand Fiber Quality (with genome editing)



wild cotton focused on “staying alive”



domesticated cotton still sacrifices fiber to make seed



we now understand what regulatory network to edit out

G3 2016 2016 1:1627-1633


Thank You
for visiting us