Rapport de mission aux USA

du 4 au 10 janvier 2005

Participation aux Cotton Beltwide Conferences, New Orleans (LA)

Jean-Paul Gourlot
Unité propre de recherche
« Qualité et production cotonnière »
Cirad-ca
Janvier 2005

1 - Objectif de la mission :

- Participation aux Beltwide Cotton Conferences à New Orleans (LA), USA.
- Présentation de trois papiers (textes en annexe) :

1 GOURLOT J.-P., GERARDEAUX, E., FRYDRYCH R., GAWRYSIAK G., FRANCALANCI P., GOZE E., DREAN J.-Y. and LIU Rui, 2005, Sampling Issues For Cotton Fibre Quality Measurements Part 2 : Impact on Cotton Testing Instrument Results, Beltwide Cotton Conferences, New Orleans (LA), 4-10 janvier 2005.

2 GOURLOT J.-P., HUNTER L., GINER M., BOUBAKER M., DREAN J.-Y., 2005, CATI : Application of Image Analysis Systems For Seed Coat Fragment Detection And On Other Fibre Characterization, Beltwide Cotton Conferences, New Orleans (LA), 4-10 janvier 2005.

3 GOZE E., LASSUS S. , BACHELIER B., FRYDRYCH R., GOURLOT J.-P., 2005, The H2SD : inter-laboratory test results, Beltwide Cotton Conferences, New Orleans (LA), 4-10 janvier 2005.

2 - Planning

4 janvier 2005 : Montpellier - Paris CDG – Atlanta – New Orleans.

5 - 8 janvier 2005 : Participation aux conférences Beltwide.

10-11 janvier 2005 : New Orleans – Atlanta – Paris CDG – Montpellier.

3 - Personnes rencontrées :

Jean-Yves Dréan et Marc Renner, ENSITM Mulhouse

Preston Sasser et Mike Watson, Cotton Incorporated, Cary NC, USA

Hossein Gorashi, Roger Riley et Mike Galyon, Zellweger Uster

Dean Ethridge, Eric Hequet, Nouréddine Abidi, Mourad Krifa, International Textile Center, Lubbock (TX)

David Mc Alister, Don Brushwood, David Chun, John Foulk, Garry Gamble, USDA ARS, Clemson (SC)

Devron Thibodeaux, Joe Montalvo, Terri Von Hoven, USDA ARS, New Orleans (FL)

Jimmy Knowlton, USDA AMS, Memphis (TN)

Terry Townsend et Rafiq Chaudhry, ICAC, Washington

4 - Beltwide Cotton Conferences

La première partie de ces conférences est surtout orientée vers les professionnels de la filière, du planteur jusqu'au manufacturier textile. Les présentations à ce niveau sont surtout d'ordre politique, avec pour sujet principal cette année, la chute importante des parts de marchés du textile américain face aux importations de textiles mondiaux.

Cette année, faute de temps, il ne m'a pas été possible de participer à ce début de semaine. Toutefois, il me semble que quelqu'un (plus politique ou management) devrait représenter le Cirad à ce moment de la conférence à l'avenir.

Les séances techniques (agenda donné en annexe 1) qui nous ont le plus intéressées sont '*Quality measurement*', '*Cotton Ginning*' et '*Cotton textile processing*' qui ont eu lieu à partir du jeudi matin jusqu'au vendredi soir. Le nombre de participants a encore nettement augmenté en moyenne par rapport aux années précédentes dans la conférence sur la mesure de la qualité du coton.

Par rapport aux années précédentes, une nouvelle conférence a été créée : « *Cotton utilization* » (gérée par Kermit Roberts de l'USDA SRRC New Orleans) qui est en fait une session jointe entre *quality measurement* et *cotton textile processing*.

4.1 - *Quality measurement*

Le spectre couvert par les présentations dans cette session s'est encore élargi de la description fine des fibres jusqu'à l'analyse de tissus.

La session d'ouverture s'est faite par Terry Townsend qui a parlé du groupe qu'il a constitué sur la mesure instrumentale et commerciale des cotons, le CSITC. La salle a réagi largement à ce travail de 'normalisation' internationale. Plusieurs personnes ont eu la même réaction *a priori* négative que celle relevée en Inde.

James Knowlton a relaté le contenu de ses missions récentes en Afrique de l'Ouest et en Chine, où l'USDA a le mandat de transmettre leur connaissance du classement de la fibre à ces deux zones de production.

La mission en Afrique de l'Ouest a montré la difficulté de parvenir à mettre un système similaire à celui des USA dans des délais raisonnables. L'impression à la vue de ses diapositives et commentaires est mitigée : il fait mention des conditions actuelles pour le côté un peu négatif, et de la volonté de néanmoins avancer vers un système instrumental mais en montrant bien les difficultés à contourner.

La Chine dispose d'une vingtaine de machine et portera se nombre à environ 200 à terme dans une première phase. Contrairement à l'USDA qui a concentré ses machines dans 12 laboratoires répartis sur la zone cotonnière des USA, la Chine va les répartir dans environ 100 laboratoires sur sa zone de production. La difficulté du contrôle inter-laboratoire va donc être très importante. Les standards d'étalonnage retenus pour micronaire, longueur et ténacité sont les standards universels au début, avec une possibilité que la Chine crée son propre service de création en partenariat avec l'USDA. En revanche pour les mesures de couleur et taux de déchets, des études sont déjà en cours pour établir un système propre de référencement à des standards existant sur la base des mesures de base Rd%, +b etc. La Chine cherche par ailleurs à aller plus loin dans la classification et étudie la possibilité de mesurer les neps et le collage dans de brefs délais quand la première phase sera en fonctionnement optimal.

La communication du Cirad sur l'impact du mode d'échantillonnage sur la variabilité des résultats a interpellé le public (textes et diaporamas complets des trois communications sont donnés en annexe 2).

La salle était comble pour cette première session avec environ une centaine de personnes présentes. La salle s'est ensuite un peu vidée pour les exposés suivants, exposés plus techniques et ayant moins de portée commerciale.

Frederick Shofner a présenté ses communications sur ses appareillages dans d'autres sessions, en particulier sur l'égrenage pour toucher davantage d'utilisateurs. Uzi Mor de Lintronics n'était *a priori* pas présent cette fois.

Les communications de Marc Renner et Jean-Yves Dréan ont porté sur des sujets où le Cirad est associé.

4.2 - Cotton utilization conference

Plusieurs papiers très techniques ont été présentés sur l'infroissabilité des étoffes, mais je n'ai pas pu m'y rendre car je présentais à la même heure.

Cette session est nouvelle cette année et reprend en fait l'idée d'une « *joint session* » entre *processing* et *quality measurement* en étendant son champ jusqu'au produits textiles finis. Peut-être une opportunité pour plus tard ?

4.3 - Discussions avec H. Ghorashi

J'ai rencontré Hossein Ghorashi, Mike Galyon et Roger Riley pour faire état de l'avancement du projet mené en partenariat. Le sujet porte sur l'influence de l'humidité des cotons sur la mesure de leur ténacité. Toute la phase de préparation des échantillons étant terminée, la phase de caractérisation est entamée pour ce qui est des mesures de caractéristiques technologiques des cotons. Pour la part mesure de la teneur en eau des fibres, une (parmi trois) des déterminations est finie pour tous les échantillons. Je me suis engagé à fournir régulièrement les résultats d'analyse des fibres par courriel à Roger Riley pour qu'il vérifie que tout se passe bien en terme d'analyse. Par ailleurs, j'ai donné pour probable la fin des analyses sur Spectrum en fin mars. Restera alors à réaliser toutes les analyses de données telles que commandées par le constructeur.

4.4 - Utilisation de CATI

Depuis décembre 2002, ITC et Cotton Incorporated sont détenteurs d'un système Trashcam/CATI. Une communication passée de M. James Simonton, ex-chercheur à ITC, montre que Trashcam intéresse surtout ITC pour son adaptabilité à mesurer d'autres contaminants dans la fibre. Dans ce cas précis, ITC veut teindre des étoffes, et comptabiliser le nombres de zones non teintes révélatrices de présence de fibres immatures ou de 'shiny neps'. Simonton ayant quitté ITC, Mourad Krifa se propose de continuer a utiliser le logiciel pour ses propres recherches. Il est prévu d'échanger sur ce sujet à l'avenir et de lui fournir la dernière version du logiciel CATI afin qu'il la teste sur ses échantillons.

Par ailleurs, Rick Byler de USDA Stoneville (MS) serait intéressé pour faire des études d'adaptabilité de CATI en égrenage. Il est prévu que nous reprenions contact dans l'année. Rappel : Byler travaille dans l'équipe de Stanley Anthony, chercheur qui a proposé une solution de mesure du collage en ligne dans les lignes d'égrenage et qui détient un brevet pour sa technique.

4.5 - Autres informations collectées

La machine de Shaffner Technology a été présentée par Fred Shofner dans les séances sur l'égrenage. Il reste très critique vis-à-vis de ses concurrents car il considère qu'il faudrait faire faire évoluer les appareils de mesure pour que leurs résultats soient remis dans des échelles vérifiables. Rappelons en effet que les échelles de mesure utilisées, bien qu'étant établies en référence à des échelles vérifiables au départ, ont dérivé au fil du temps vers des échelles qui n'ont plus rien à voir avec les standards ISO actuels (en particulier pour la couleur par exemple qui n'a plus grand-chose à voir avec les références du Commission Internationale de l'Eclairage CIE).

Bien que les constructeurs préparent des équipements de mesure pour les installer en bout de ligne d'égrenage, peu de personnes pensent que leurs résultats pourront être utilisés en vue d'une classification commerciale. En effet, les difficultés sont immenses pour parvenir à des résultats comparables dans des conditions de mesure très variables. Il y a par ailleurs un enjeu de taille pour les constructeurs de ces dispositifs dans le contexte actuel de tentative de normalisation internationale par l'ICAC et son groupe CSITC.

5 - CSITC expert panel

Un dîner de discussion a eu lieu sur l'intiative de Terry Townsend avec Rafiq Chaudhry, Gérald Estur, Dean Ethridge, Eric Hequet, James Knwolton et JPG. Les discussions ont confirmé le contenu des présentations respectives de Townsend et Knowlton en mettant en exergue l'importance de la maintenance des équipements (service après-vente, pièces détachées, maintenance préventive...) dans les pays en voie de développement.

Discussion interne Cirad avec Mathieu Weil (26/1/2005)

En première approche, le CSITC envisage d'organiser le contrôle de la qualité des résultats fournis par tous les laboratoires impliqués en s'appuyant sur divers organismes (Figure 1) :

- l'ICAC émettrait des certificats de 'bonne conduite' aux laboratoires de classement sur conseils techniques relevés lors d'audits réalisés par l'USDA et/ou le Faserinstitut de Brême.
- Comme le nombre de laboratoires à auditer est très important dans le monde, USDA et Brême devront déléguer la capacité à auditer à d'autres auditeurs (type SGS, Wakefield Inspection, Cirad ?, laboratoires régionaux ...).
- Chacun des laboratoires de terrain aurait à suivre des procédures édictées par le CSITC sur le modèle de la norme ISO 17025[1] par exemple, qui intègre des exigences propres à tout système de management de la qualité et qui concernent en particulier la traçabilité et la fiabilité des résultats.

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[1] **NF EN ISO/CEI 17025,** Ed Afnor, mai 2000 : Ce référentiel est principalement dédié aux **activités d'essais ou d'étalonnages** et stipule des exigences de **qualité organisationnelle** et de **maîtrise métrologique** afin de garantir la validité des résultats délivrés. Il donne lieu à une "accréditation", reconnue internationalement, révisée annuellement et valable trois ans.

- Pour comparer avec l'ISO 9001, l'objectif premier de l'ISO 17025 est de **garantir la viabilité du résultat délivré** et de son expression.

- Pour une unité de recherche, le choix entre les deux référentiels est fonction des besoins et des objectifs stratégiques de l'équipe. Par exemple :

  - une **certification** (ISO 9001) est une garantie pour les contractants ou parties prenantes d'avoir leurs attentes satisfaites de manière continue,
  - une **accréditation** (ISO 17025) est une garantie pour les contractants ou parties prenantes de la robustesse des résultats délivrés

Quelque soit le choix du référentiel, **les apports sont appréciables** en terme d'amélioration des processus quotidiens, de maîtrise documentaire, de capitalisation des savoirs et savoir-faire et donc d'efficience globale pour l'unité de recherche.

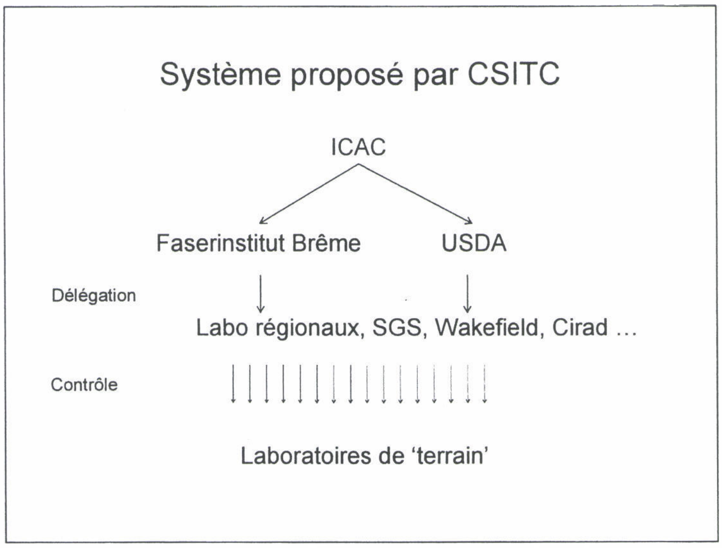

Figure 1: Système proposé par le CSITC.

Dans ce contexte, les organisations nationales et internationales d'accréditation et de certification ne sont pas prises en compte.

La discussion avec Mathieu Weil a permis de proposer une solution qui pourrait permettre d'obtenir le même résultat (difficile à dire car le résultat attendu n'a justement pas été très bien défini au préalable) en s'appuyant sur des organisations nationales d'accréditation (Figure 2) : ce mode de fonctionnement s'appuie sur l'International Accredition Consortium (IAC), dont les organismes nationaux d'accréditation (comme le COFRAC en France) sont membres. Les laboratoires installés dans chacun des pays devraient se faire accréditer ISO 17025 par les organismes d'accréditation locaux. Il serait à la charge de l'ICAC par exemple de récupérer et diffuser les résultats des audits pour une utilisation dans le milieu du coton.

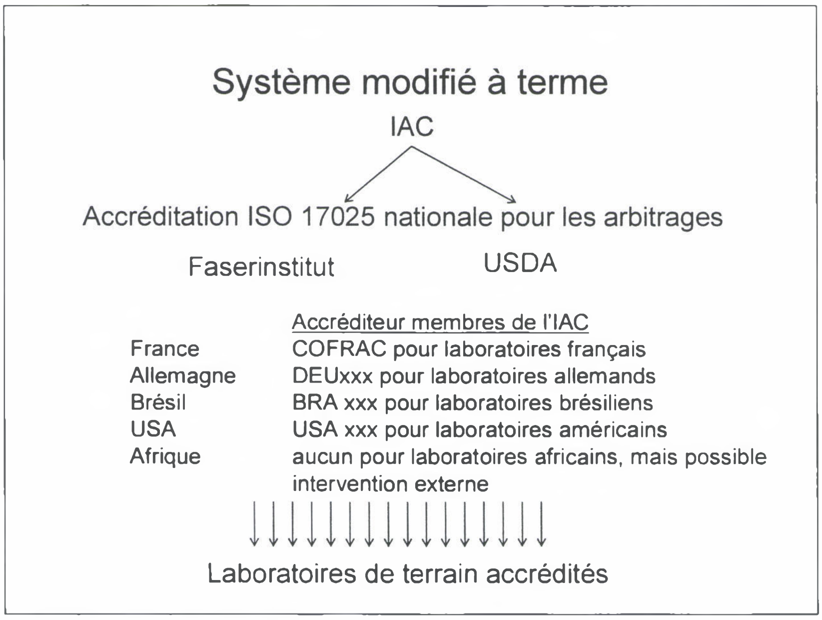

Figure 2: Système optimal proposé.

Cependant, il faudra de nombreuses années pour parvenir à un tel système, certains pays ne disposant pas encore d'organisme d'accréditation. Un mode de fonctionnement intermédiaire est donc proposé (Figure 3). Il s'agirait de construire un référentiel (c'est à dire de déterminer des règles de fonctionnement assez proches des normes ISO 17025 par exemple) et de les faire appliquer dans tous les laboratoires Les laboratoires de terrain pourraient alors, après audit, être reconnus conformes au référentiel en attendant d'obtenir le statut de 'laboratoire accrédité.

Le nombre de ces audits et leur besoin de crédibilité et de reproductibilité pourraient nécessiter de faire appel à des organismes internationaux spécialisés dans la conduite de tels audits tels que SGS, ou encore Bureau Veritas.

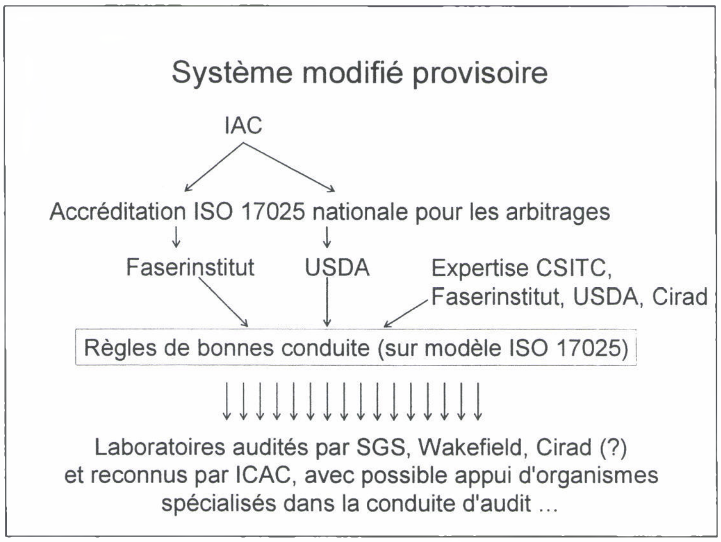

Figure 3: Système intermédiaire possible.

Note : un risque de confusion dû à l'exemple de SGS existe dans les figures : en effet SGS est organisme de certification mais pourrait aussi intervenir pour attester d'une simple "reconnaissance conforme".

A partir des réflexions conduites suite à la mission en Inde (11/2004), des informations collectées dans cette conférence, et des projets connus ou dans lesquels le Cirad est impliqué, je tente ci-après de lister les points à éclaircir (sans ordre de priorité ni d'importance à ce niveau) pour ce projet CSITC.

- L'étude mise en place dans le cadre du programme Qualité de l'UEMOA (Union Economique et Monétaire Ouest Africaine) dans laquelle le Cirad intervient sur financement ONUDI doit aider à consolider structurellement la compétitivité de la production et l'exportation de coton grâce à une amélioration de l'image de la qualité produite. Pour asseoir une bonne crédibilité des efforts engagés, cette étude doit réussir, c'est-à-dire cumuler les atouts pour que ces pays produisent à terme (rapidement ?) des résultats crédibles, et ce dès la publication des premiers résultats, ou leur utilisation dans les transactions commerciales.

- Il faut que le groupe CSITC prenne conscience de l'importance de l'approche scientifique de la mise en place des procédures dans les différents pays. Pour ce faire, il est possible que je demande un temps de parole lors de la prochaine réunion, pour faire un exposé sur tout ce qu'il est nécessaire de faire pour parvenir à des résultats crédibles : normalisation, certification avec tout le volet institutionnel national, régional et international nécessaire (existe-t-il partout ? sinon, comment le construire, le modifier … ?).

- Faire une étude des résultats du test inter-laboratoires de Brème sur plusieurs années pour voir quels seraient les intervalles de confiance sur les mesures utilisables par le commerce, en supposant que les échantillons sont bien représentatifs des balles à l'origine. Cette étude doit donc s'articuler avec la publication du Cirad au Beltwide sur l'échantillonnage et la variabilité des mesures par HVI, pour en tirer des enseignements sur l'organisation des check test inter-laboratoires organisés par le Cirad (un sur la fibre et un sur le collage) A titre d'exemple, il est sans doute possible d'améliorer la préparation des échantillons et l'analyse des résultats des différents laboratoires.

- Il faut connaître la répartition des pays pour lesquels les producteurs sont détenteurs de la fibre jusqu'à sa vente face à ceux qui détiennent uniquement le coton-graine. Voir quelles sont les implications pour le classement et les flux financiers de rétribution du travail de chaque acteur de la filière.
- Il faudra aborder le coût du classement (installation ou adaptation) dans les différents pays, et voir si ce coût peut être un frein à l'adoption d'un tel système international. Dans l'affirmative, envisager des mécanismes d'appui financier.
- Dans quelle mesure le contrôle externe des services de classement pour le suivi de la certification peut poser un problème pour les différents pays ? Cela est évidemment lié avec l'organisation des filières locales, y compris en prenant en compte les législations locales, régionales et internationales.
- Comment est organisée la filière coton aux USA ? Quel est le statut du National Cotton Council ? Est-ce transposable ? Comment cela se passe t'il dans les autres pays producteurs ? La Chine sera un acteur majeur ; comment l'intégrer dans la démarche ?
- Comment est organisé le CICCA (*Committee for International Cooperation between Cotton Associations*) et quels sont ses membres ? Quelle est la place de l'International Cotton Association (ex Liverpool) ? Quel est le rôle dévolu aux associations cotonnières, à l'Association Cotonnière Africaine ? Leurs évolutions sont elles en phase avec l'effort CSITC ?
- Quelles sont les correspondances entre les divers standards mondiaux (types de vente, cotons d'étalonnage …) ? Tous les cotons mondiaux sont ils analysables par CMI ? Les gammes autorisées par les appareils de mesure sont elles assez ouvertes pour le permettre (longueur, ténacité, couleur, teneur en eau ; quid des cotons colorés ?) ? S'il y a un impact de la couleur sur la mesure de ténacité, comment rendre comparables les résultats indépendamment de la couleur ?
- Quelles possibilités de financement pour financer la mise en place de cette normalisation des mesure (grâce au comité CSITC) et son suivi (audits, certifications, reconnaissance…) ?
- Quelles sont les procédures pour valider/approuver les 'nouveaux' équipements de mesure dans l'objectif de les utiliser pour un classement commercial selon les règles qui seront définies par le CSITC ?
- Actuellement, parmi tous les contrats de vente de coton qui sont émis, une partie seulement est soumise à des procédures d'arbitrage : quel pourcentage ? est-ce prioritairement des problèmes de qualité, de mesure, de caractérisation ou des problèmes autres (chargement, quantité, prix…) ?
- Pour le Cirad et/ou en partenariat, y a-t-il moyen de monter un projet pour étudier toutes ces questions ? Les réponses arriveront elles à temps pour être efficaces et suivies ?
- Vérifier si le schéma proposé de la mise en place de cet effort de normalisation est conforme aux pratiques actuelles de la normalisation internationale (ISO, certification, accréditation …)

6 - Conclusion

Notre participation a permis de montrer que le Cirad est toujours présent dans le milieu de la technologie cotonnière avec une participation active sur les sujets de fond (standardisation, échantillonnage ...). On peut d'ailleurs voir que le travail du CSITC occasionne des prises de position marquées, et que notre implication doit pouvoir défendre la position des pays en voie de développement en partenariat avec Ibrahim Malloum, Président de l'ACA.

Annexe 1

Agenda des sessions

Program

Wednesday Morning, January 5

BELTWIDE COTTON PRODUCTION CONFERENCE

"Innovation and Application -- The Competitive Edge"

Marriott Grand Ballroom Acadia

Presiding: Woody Anderson, Chairman, National Cotton Council, Colorado City, TX

8:15 **Welcome** – Bob Odom, Louisiana Commissionr of Agriculture and Forestry, Baton Rouge, LA

8:20 **Opening Remarks** – Woody Anderson

8:35 **Washington Update** – John Maguire, National Cotton Council, Washington, DC

MANAGING LINT QUALITY, MAKING A PROFIT

Moderator: Gary Adams, National Cotton Council, Memphis, TN

8:50 **Economics** – Gary Adams

Agronomics – J. C. Banks, Oklahoma State University, Altus, OK

Harvest Preparation – Charles Ed Snipes, Mississippi State University, Stoneville, MS

Ginning – Tommy Valco, USDA-ARS, Stoneville, MS

9:45 **Nematodes: What We Know And What We Are Doing** – William Gazaway, Auburn University, Auburn, AL

10:00 **Break**

CONSERVATION TILLAGE: MAKING IT WORK

Moderator: Woody Anderson

10:30 Jeff Mitchell, University of California - Davis, Parlier, CA
Charles Stichler, Texas A&M University, Uvalde, TX
Andy Page, USDA-NRCS, Perry, GA
John Bradley, Beltwide Cotton Genetics, Collierville, TN

11:30 **Market Place Insights** – William B. Dunavant, Jr., Dunavant Enterprises Inc., Memphis, TN

12:00 **Adjourn**

Wednesday Afternoon, January 5

NEW DEVELOPMENTS FROM INDUSTRY

Sheraton Grand Ballroom C

1:00 – 5:50 pm

VARIETIES

Session is devoted to cotton varieties that will be commercially available in 2005. Information is presented on both conventional and transgenic varieties.

Presiding: TBA

1:00 **DP 488 BG/RR: New High Quality, Mid-Full Maturity Stacked Gene Variety from D&PL** – Dave Albers[1], Tom Kerby[2], Ken Lege[3], Tom Speed[1] and Kevin Howard[2], (1)Delta and Pine Land Company, Lubbock, TX, (2)Delta and Pine Land Company, Scott, MS, (3)Delta and Pine Land Company, Piedmont, AL

1:10 **DP 432 RR and DP 434 RR: New High Quality, Early Maturing RR's from D&PL** – Tom Speed[1], Tom Kerby[2], Ken Lege[3], Dave Albers[1] and Kevin Howard[2], (1)Delta and Pine Land Company, Lubbock, TX, (2) Delta and Pine Land Company, Scott, MS, (3)Delta and Pine Land Company, Piedmont, AL

1:20 **DP 393, A New Early-maturing, Conventional Picker Variety with High Yield and Fiber Quality Potential** – Ken E. Lege, Delta and Pine Land Co., Piedmont, AL and Robert E. McGowen, Delta and Pine Land Co., Scott, MS

1:30 **Higher Quality Variety** – John M. Green and E Linwood Roberts, SEED SOURCE, INC., Stoneville, MS

1:40 **ST 4575BR & ST 4686R, Early-Mid Maturing Varieties with High Yield Potential and Fiber Quality** – C. Andy White and Mike Robinson, Emergent Genetics, Inc., Memphis, TN

1:50 **Stoneville® Brand ST 3636B2R and Stoneville Brand ST 5454B2R, Bollgard II + Roundup Ready Varieties from Emergent Genetics, Inc** – C. A. White, Jaime Yanes and M. Robinson, Emergent Genetics, Inc., Memphis, TN

2:00 **Stoneville® Brand ST 6848R and ST 6636BR—Two New Full-Season Varieties from Emergent Genetics, Inc** – Jaime Yanes and Mark Barfield, Emergent Genetics, Inc., Memphis, TN

2:10 **Stoneville® Brand ST 3664R and NEXGEN ™ Brand 3969R—Two New, Mid-Season Stormproof Varieties from Emergent Genetics, Inc** – Kenny D. Melton and Steve D Calhoun, Emergent Genetics, Inc., Memphis, TN

2:20 **PHY 310 R, PHY 410 R and PHY 510 R: New Upland Roundup Ready Varieties from Phytogen** – Mustafa McPherson, Phytogen Seed Company, LLC, Greenville, MS

2:30 **PHY 710 R Acala and PHY 810 R Pima: New Roundup Ready Varieties from Phytogen** – Joel Mahill, Phytogen Seed Company, LLC, Corcoran, CA

2:40 **PHY 440 W, PHY 470 WR and PHY 480 WR: New Upland Varieties from Phytogen with the New WideStrike Insect Protection Technology from Dow AgroSciences Alone or Stacked with Roundup Ready** – Mustafa McPherson, Phytogen Seed Company, LLC, Greenville, MS

2:50 **PHY 800 Pima: A New Pima Variety from Phytogen** – Joel F. Mahill, John W. Pellow, David M. Anderson, Scott E. Bordelon and Christin N. Pace, Phytogen Seed Company, LLC, Corcoran, CA

3:00 **Break**

CHEMISTRY AND OTHERS

Session includes a wide range of new products of interest to cotton growers, consultants and others. Some of these are new crop protectants, growth regulators, harvest aids, genetic traits, as well as other novel technologies.

Presiding: TBA

3:20 **WideStrike™: A New Stacked Insect Resistant Trait for Cotton** – G. D. Thompson, J. W. Pellow, L. B. Braxton, R. A. Haygood, R. M. Huckaba, R. B. Lassiter, F. J. Haile, M. M. Wilrich, J.S. Richburg and J. M. Richardson, Dow AgroSciences, Indianapolis, IN

3:30 **BAS 320 I: A New Insecticide for Control of Key Insect Pests in Cotton** – Thomas E. Anderson, A.C. Everson and R. A. Farlow, BASF Corp., Research Triangle Park, NC

3:40 **Carbine™ (flonicamid): Novel Insecticide Chemistry for Cotton** – Kristine M. Treacy, FMC Corporation, Corpus Christi, TX

3:50 **Roundup Ready Flex Cotton Technology** – Kent A. Croon, Rob A. Ihrig and J. Walt Mullins, Monsanto Company, St. Louis, MO

4:00 **Outlaw Technology – For Weed Control in Several Cropping Systems and Resistant Weed Management** – H. Ray Smith, Biological Research Service, Inc, College Station, TX

4:10 **PROWL® H2O - A Novel Water-based Formulation of Pendimethaline** – Scott Asher, BASF Corporation, Research Triangle Park, NC and Joe Schuh, BASF Corporation, Parker, CO

4:20 **DuPont Layby Pro Herbicide** – Jeff H. Meredith and Eric P. Castner, DuPont Crop Protection, Memphis, TN

4:30 **Performance of New Blizzard® Cotton Defoliant** – Robert Hinkle[1], Alan Dalrymple[1], Keith Griffith[1], Anthony Duttle[2], Stephen Colbert[1], Arturo Redes[1], and Peter J. Porpiglia[3]. (1) Crompton Corp., Hernando, MS, (2) Crompton Crop., Fresno, CA, (3) Kumiai America, White Plains, NY

4:40 **Topsin® M, a Potential Foliar Fungicide for Cotton** – Beth E. Sears, Phil Robinson, Tony Estes and Stephen Lee, Cerexagri, Inc., King of Prussia, PA

4:50 **TADS 15338: A New, Cyclanilide-based Plant Growth Regulator for Cotton** – Keith W. Vodraska[1], James R. Collins[2] and Donny J. Oleniczak[2], (1)Bayer CropScience, Lakeland, TN, (2)Bayer CropScience, RTP, NC

5:00 **DuPont Mepex Gin Out - A Unique, New PGR** – C. Steve Williams, J. Dan Smith and Jeff H. Meredith, DuPont Crop Protection, Memphis, TN

5:10 **Dynasty CST: A New Perspective in Early Seed Delivered Disease Control** – G. L. Cloud, S. Rideout and D. H. Long, Syngenta Crop Protection, Greensboro, NC

5:20 **N-HIBIT® Seed Treatment and ProAct®: Harp-N-Tek™ Products for Use in Cotton Production** – Ned M. French, EDEN BIOSCIENCE, INC., Little Rock, AR

5:30 **Effects of AuxiGro WP on California Cotton Yield & Quality** – Frank Smith, Emerald BioAgriculture, Yuba City, CA

5:40 **Commercial Attract-and-Kill Technology for Control of Helicoverpa Moths** – Peter Gregg, Australian Cotton CRC, Armidale, Australia and Anthony Hawes, Ag Biotech Australia Pty Ltd, Richmond, Australia

5:50 **Adjourn**

Wednesday Afternoon, January 5

SYMPOSIUM: NUTRIENT MANAGEMENT PLANS AND COTTON FERTILITY

Sheraton Grand Ballroom A

1:30 – 5:00 pm

The Soil and Plant Nutrition Conference presents the symposium, Nutrient Management Plans and Cotton Fertility. This timely symposium discusses the role the Clean Water Act has on nutrient management and cotton production. Additionally, the impact of the global fertilizer market on cotton fertility will be discussed. Several presentations will discuss options for managing nutrients while maintaining high yields. A panel consisting of two researchers, two consultants and two producers will discuss nutrient management in their respective geographies. The symposium will conclude with an audience question and answer session.

Moderator: Michael Kenty, Helena Chemical Company, Collierville, TN

1:30 **What Does the Clean Water Act Have to Do With Cotton Production** – TBA

1:50 **Global Fertilizer Markets and Modern Cotton Production** – Toby Hlavinka, Southern Business Unit, Helena Chemical Company, East Bernard, TX.

2:10 **Tillage Practices and Nutrient Management Plans** – John Bradley, Beltwide Cotton Genetics

2:25 **Pre-Season Soil Testing Considerations for Nutrient Management Plans** – Bob Thompson, Starkville, MS

2:40 **Nitrogen Management for Yield and Quality** – J. Scott McConnell, University of Arkansas, Monticello, AR

3:00 Break

3:15 **In Season Nutrient Evaluation Methods** – Merritt Holman, Arkansas Crop Technologies, Inc., Lonoke, AR

3:35 **Economic Evaluation of a Soil and Foliar Applied Fertility Program** – Roland Roberts, University of Tennessee, Knoxville, TN

3:55 **Current Production Systems and Possible Changes Relative to the Clean Water Act – Panel Discussion**
Glenn Harris, University of Georgia, Tifton, GA
J.C. Banks, Oklahoma State University, Altus, OK
Charlie Guy, G & H Associates, Tillar, AR
Harold Lambert, Lambert Agricultural Consulting, Inc., Innis, LA
Shep Morris, Producer, Alabama
Cannon Michael, Producer, California

4:30 **Questions & Answer Session** – All Speakers

5:00 **Adjourn**

Wednesday Afternoon, January 5

INTRODUCTION TO OPTIONS HEDGING

Sheraton Grand Ballroom B

1 – 2 pm

Low prices and weather-related production losses over the past four years have reinforced the advisability of developing a strong risk management program that makes use of innovative marketing strategies, crop insurance and advanced farm and financial management techniques.

The use of options as a marketing and risk management tool is the focus in this session. It is oriented towards those market participants that have minimal experience using options trading to hedge price risks and will cover terminology and basic options strategies.

Speaker: TBA

Wednesday Afternoon, January 5

ADVANCED OPTIONS

Sheraton Grand Ballroom B

2 – 3 pm

Low prices and weather-related production losses over the past four years have reinforced the advisability of developing a strong risk management program that makes use of innovative marketing strategies, crop insurance and advanced farm and financial management techniques.

This session on options is oriented to those market participants with significant experience using options to hedge price risks. The terminology and advanced options strategies will be the focal point of the session.

Speaker: TBA

Wednesday Afternoon, January 5

FARM MANAGEMENT: QUICKEN ON THE FARM

Sheraton Grand Ballroom B

3:30 – 4:30 pm

Using risk management tools effectively requires growers to keep detailed records on production, financing and marketing. Affordable, easy-to-use solutions are available for growers using computers. These sessions focus on implementing cost-effective bookkeeping software solutions on your operation.

"I bought a computer but never have learned to make it pay for itself." If this is you, take heart. This session will show you that it's not difficult to automate your record keeping.

Speaker: Wade Polk, Texas A&M University, San Angelo, TX

Wednesday Afternoon, January 5

FARM MANAGEMENT: INTRODUCTION TO QUICKBOOKS

Sheraton Grand Ballroom B

4:30 – 5:30 pm

Using risk management tools effectively requires growers to keep detailed records on production, financing and marketing. Affordable, easy-to-use solutions are available for growers using computers. These sessions focus on implementing cost-effective bookkeeping software solutions on your operation.

Getting the reports you need for agricultural lenders can be time-consuming. With a little advanced planning and diligent record keeping, Quickbooks can rapidly generate the reports you need to secure production financing.

Speaker: Wade Polk, Texas A&M University, San Angelo, TX

Thursday Morning, January 6

BELTWIDE COTTON PRODUCTION CONFERENCE
"Innovation and Application -- The Competitive Edge"

Marriott Grand Ballroom Acadia

Presiding: John Pucheu, Chairman, American Cotton Producers, Tranquillity, CA

8:15 **Opening Remarks** – John Pucheu

8:20 **Plant Protection and Biotech Products in the Pipeline** – Frank Carter, National Cotton Council, Memphis, TN

MANAGING TODAY'S INSECT THREAT

8:30 **Western Insects** – Pete Goodell, University of California - Davis, Parlier, CA
Stink Bugs – Jeremy Greene, University of Arkansas, Monticello, AR
Plant Bugs – Ralph Bagwell, Louisiana State University, Winnsboro, LA

9:00 **Beating the Competition Through Research and Promotion** – Berrye Worsham, Cotton Incorporated, Cary, NC

INNOVATIVE GROWER PANEL

Moderator: John Pucheu

9:15 **Arid West** – Ron Rayner, Goodyear, AZ
Semi-Arid Southwest – Mike Hughes, Lamesa, TX
Mid-South – Herrick Norcross, Marion, AR
Southeast – Ronnie Lee, Bronwood, GA

10:00 **Adjourn**

Thursday Morning, January 6

NEW DEVELOPMENTS FROM INDUSTRY

Sheraton Grand Ballroom A
10:30 – 11:50 am

EQUIPMENT AND TECHNOLGIES

This session is devoted to new cotton production equipment, harvesting equipment, ginning equipment and emerging practices in the arena of precision agriculture.

10:30 **The Use of ProTag to Control Counterfeit Seed Sales** – Bill L. Bettis[1], Peter Marks[1] and Peter Halmer[2], (1)Germain's Technology Group, Gilroy, CA, (2)Germain's Technology Group, King's Lynn, Norfolk, United Kingdom

10:40 **Improved Ginning Efficiency with the Power Roll Gin Stand** – Russell Laird, PRT Marketing, LLC, Fort Worth, TX

10:50 **Improved Apparatus for Compressing and Baling Lint Cotton** – Joe W. Thomas and Royce Gerngross, Lummus Corporation, Savannah, GA

11:00 **New 2005 Model CPX420 and CPX620** – Trent Haggard and Kevin Richman, Case IH, Racine, WI

11:10 **Pick Up The Pace With The John Deere 9996 Cotton Picker** – Henry C. Sink, John Deere, Des Moines, IA

11:20 **Making Precision Ag Profitable Through Remote Sensing** – John Kelly Dupont, InTime, Inc., Cleveland, MS

11:30 **Real Time Lint Properties Measurement Helps Adjust Cleaning Parameters** – Mike Gvili, ASCI, Maynard, MA

11:40 **Asset Management: Alternatives to Equipment Ownership** – Dave Govert, MachineryLink, Inc., Kansas City, MO

11:50 Adjourn

Thursday Morning, January 6

SYMPOSIUM: COTTON ECONOMIC OUTLOOK PANEL

Sheraton Bayside A - C
10:30 – 12:00

The goal of this session is to provide a current market outlook for cotton, including projections; and to consider how emerging market/policy questions may affect the risk exposure of industry participants. The session format is a series of 15 minute presentations by leading cotton economists. Following the presentations, a moderated question and answer period is planned.

Moderator: John Robinson, Texas Cooperative Extension

PANELISTS

Carl Anderson, Department of Agricultural Economics, Texas A&M University, College Station, TX
Pat Westhoff, Food and Agricultural Policy Institute, University of Missouri, Columbia, MO
Gary Adams, National Cotton Council, Memphis, TN

Thursday Morning, January 6

WORKSHOP: MANAGING EARLY-SEASON PESTS – THE VALUE OF SEED TREATMENTS FOR TODAY'S COTTON GROWER

Sheraton Grand Ballroom D
10:30 – 12:00

The purpose of the workshop is to update cotton growers regarding what seed treatments can do for them. Seed treatments increasingly play a role in controlling a wide range of early-season pests: insects, fungi and nematodes. The workshop describes early-season pests as well as management options. Also included is a comparison of seed treatments specifically directed at early-season pest management vs. other pest management strategies.

Presiding: Robert Kemerait, University of Georgia, Tifton, GA

10:30 **Introduction** – Robert Kemerait, University of Georgia, Tifton, GA

10:35 **The Value of Fungicide Seed Treatments and Seed Treatment Chemistries for Cotton Stand Establishment: Twelve Years of Results from the Cotton Disease Council's National Cottonseed Treatment Trials** – C. S. Rothrock and S. A. Winters, Dept. of Plant Pathology, University of Arkansas, Fayetteville, AR

10:55 **The Value of Seed Treatments for the Management of Early-Season Insect Pests on Cotton** – C. T. Graham, Gustafson, Grenada, MS

11:15 **The Current Status of Nematicide Seed Treatments for the Management of Parasitic Nematodes on Cotton** – S. L. Rideout, Syngenta Crop Protection, Inc., Leland, MS

11:35 **The Future for Seed Treatments on Cotton** – Bill Hairston, Gustafson, Dallas, TX

11:50 **Discussion**

12:00 **Adjourn**

Thursday Morning, January 6

SYMPOSIUM: SUSTAINABILITY OF GLYPHOSATE-RESISTANT COTTON PRODUCTION

Sheraton Grand Ballroom C
10:30 AM – 12:00 PM

This session will provide producers with essential information to sustain the usefulness of glyphosate in cotton. The importance of the glyphosate and Roundup Ready technologies to cotton production will be described. Speakers will address changes in herbicide use patterns due to glyphosate technology and weed management considerations including weed shifts and volunteer Roundup Ready crops in other Roundup Ready crops. The current state of glyphosate weed resistance, particularly horseweed resistance, and the likelihood of resistance in other weeds will be explained as well as frequency of glyphosate-resistance weeds compared to other herbicide chemistry groups. An overview of weed resistance and its evolution will be provided. Suggested management strategies for weed shifts and herbicide resistance will conclude the session. A discussion period will follow to allow interaction with audience and speakers.

Presiding: Alan C. York, North Carolina State University, Raleigh, NC

10:30 **Introductory Comments** – Alan C. York, North Carolina State University

10:35 **Impact of Roundup Ready Technology on Cotton Production in US** – Peter A. Dotray, Texas Tech University, Texas Agricultural Experiment Station, Texas Cooperative Extension, Lubbock, TX

10:50 **Principals of Weed Resistance Management** – Ron Vargas, Univ of Calif. Cooperative Extension, Madera, CA and Steve Wright, Univ of Calif. Cooperative Extension, Tulare, CA

11:05 **Weed Shifts and Volunteer Crops in Roundup Ready Systems** – A. Stanley Culpepper, University of Georgia, Tifton, GA

11:20 **Glyphosate-Resistant Weeds: Current Problems, Potential Problems** – Robert M. Hayes, University of Tennessee, Jackson, TN

11:35 **Management Practices to Sustain Roundup Ready Cotton Production** – Charles Ed Snipes, Mississippi State University, Stoneville, MS

11:50 **Discussion**

12:00 **Adjourn**

Thursday Afternoon, January 6

COTTON DISEASE COUNCIL

Marriott Mardi Gras Ballroom Salon D

Presiding: Robert Kemerait, Univ. of Georgia, Tifton, GA

1:00 **Introductory Remarks**

1:15 **Importance of Cottonseed and Seed Quality to Minimize the Impact of Early-Season Pests and to Maximize Yields** – T. A. Kerby, Delta and Pine Land Company, Scott, MS

1:30 **Economic Impact of Early-Season Diseases and Nematodes on the Grower Throughout the Entire Season** – W. D. Shurley, Dept. of Agricultural and Applied Economics, Univ. of Georgia, Tifton, GA

1:45 **Challenges and Solutions in the Formulation of Effective Seed Treatments for Use on Cotton** – J. L. Riggs, Gustafson, McKinney, TX

2:00 **Mechanisms for Movement of Fungicides, Nematicides and Insecticides from Seed Coat to Target Region in Cotton Production** – D. H. Long, Syngenta Crop Protection, Inc., Greensboro, NC

2:15 **New Fungicides for Use as Seed Treatments on Cotton** – T. A. Wheeler, Texas Agricultural Experiment Station, Lubbock, TX

2:30 **STAN: Seed Delivered Protection from Root-Knot, Reniform and Columbia Lance Nematodes in Cotton** – Steve L. Rideout, Syngenta Crop Protection, Leland, MS and David H. Long, Syngenta, Greensboro, NC

2:45 **Discussion**

3:00 **Break**

Presiding: Craig S. Rothrock, Univ. of Arkansas, Fayeteville, AR

3:30 **The Effect of Cotton Varieties and Aldicarb on Stand Loss Due to Fusarium Wilt in West Texas** – Terry A. Wheeler and John R. Gannaway, Texas Agricultural Experiment Station, Lubbock, TX

3:45 **Delayed Planting as a Control Strategy for Fusarium Wilt of Cotton in Australia** – Stephen J. Allen, Cotton Seed Distributors Ltd, Australian Cotton Research Institute, Narrabri, NSW, Australia

4:00 **The Influence of the Southern Green Stink bug (*Nezara viridula* L.) and Topsin M WSB on Hardlock Incidence and Severity in Cotton** – G.B. Padgett, B.R. Leonard, and M.A. Purvis. LSU AgCenter, Macon Ridge Research Station, Winnsboro, LA

4:15 **Use of Atoxigenic Strains of *Aspergillus flavus* to Manage Aflatoxins in South Texas: Initial Experience with Commercial Treatments** – Peter J. Cotty, USDA, Agricultural Research Service, Tucson, AZ

4:30 **Fusarium in Acala and Pima Cotton: Symptoms and Disease Development** – Bob Hutmacher[1], R. Michael Davis[2], Mauricio Ulloa[3], Steve Wright[4], Dan S. Munk[5], R.N. Vargas[6], B.A. Roberts[7], B.H. Marsh[1], M.P. Keeley[1], Y. Kim[2], and Richard Percy[8]. (1) Univ. of California, Shafter, CA, (2) Univ. of California - Davis, Davis, CA, (3) USDA-ARS, Shafter, CA, (4)Univ. of California, Tulare, CA, (5) Univ. of California, Fresno, CA, (6)Univ. of California, Madera, CA, (7) Univ. of California, Hanford, CA, (8)USDA-ARS, Maricopa, AZ

4:45 **Business Meeting**

5:30 **Adjourn**

POSTER PRESENTATIONS – SEE PAGE 32

Thursday Afternoon, January 6

COTTON ECONOMICS AND MARKETING CONFERENCE

Marriott La Galeries 1 & 2

Presiding: Jeanne Reeves, Cotton Incorporated, Cary, NC

1:10 **Welcoming Remarks**

1:15 **An Economic Evaluation of Tillage Systems for Cotton Production in Texas** – J. L. Johnson, J. R. Robinson, W. J. Thompson, L. L. Falconer, and M. W. Polk. Texas Cooperative Extension, San Angelo, TX

1:30 **Five Years Experience with No-Till Cotton Following A Wheat Cover Crop** – Steve Cummings, Mississippi State Univ., Coffeeville, MS

1:45 **Impacts of Bt Cotton on Insecticide Use: A Beltwide Analysis** – George B. Frisvold, Univ. of Arizona, Dept. of Agricultural & Resource Economics, Tucson, AZ

2:00 **Current Cost/Benefit Assessment of Boll Weevil Eradication Programs in Texas** – David F. Barham and John R. C. Robinson, Dept. of Agricultural Economics, Texas A&M Univ., College Station, TX

2:15 **The Economics of Crop Termination and Use of Field Cleaners** – Raghu Kulkarni[1], Mark Kelley[2], Randall K. Boman[3], Alan Brashears[3], Eric Hequet[4], and Eduardo Segarra[1]. (1) Texas Tech Univ., Agricultural and Applied Economics, Lubbock, TX, (2) Texas Cooperative Extension - Lubbock, Lubbock, TX, (3) USDA-ARS, Lubbock, TX, (4) International Textile Center, Texas Tech Univ., Lubbock, TX

2:30 **Efficacy and Evaluation of Yield, Fiber Quality, and Profitability Of Nematode Controls In Georgia** – W. Don Shurley and Robert C. Kemerait, Univ. of Georgia, Tifton, GA

2:45 **Discussion**

3:00 **Break**

Presiding: Ken Paxton, Louisiana State Univ., Baton Rogue, LA

3:15 **Testing Appropriate On-Farm Trial Designs and Statistical Methods for Cotton Precision Farming** – Terry Griffin, Glenn Fitzgerald, Dayton Lambert, and J. Lowenberg-DeBoer. Agricultural Economics - Purdue Univ., West Lafayette, IN

3:30 **Why Bt over Non-Bt Cotton in the Delta** – Swagata "Ban" Banerjee, Delta Research and Extension Center, MAFES, Mississippi State Univ., Stoneville, MS and Steven W. Martin, Mississippi State Univ., Stoneville, MS

3:45 **Influence of Winter Cover Crop, Nitrogen, Lime and Tillage on Cotton Net Revenues** – Rebecca L. Cochran, James A. Larson, Roland K. Roberts, Donald D. Tyler, Univ. of Tennessee, Knoxville, TN

4:00 **Precision Agricultural Practices for Optimal Use of Phosphorous** – Raghu Kulkarni[1], Margarita Velandia[1], Roderick Rejesus[1], Eduardo Segarra[1], and Kevin Bronson[2]. (1) Agricultural and Applied Economics, Texas Tech Univ., Lubbock, TX, (2) Texas Agricultural Experiment Station, Texas A&M Univ., Lubbock, TX

4:15 **Economic Evaluation of Integrated Cropping System with Cotton** – Rebekka Martin, Vernon Lansford, Eduardo Segarra, and Vivien Allen, Agricultural and Applied Economics, Texas Tech Univ., Lubbock, TX

4:30 **Anticipated Benefits from Flex Cotton: Results of a Beltwide Survey** – Michele C. Marra, North Carolina State Univ., Dept. Agricultural and Resource Economics, Raleigh, NC and Julian Alston, UC - Davis, Dept. of Agriculture and Resource Economics, Davis, CA

4:45 **The Economic Impact of the Skip Row Planting Pattern on My Cotton Farming Operation** – Keith Morton, Morton Farms, Mississippi State, MS

5:00 **Cotton Yield Intelligent Prediction Research** – XiaoWen Wei, CRI, CAAS, Anyang, China

5:15 **Adjourn**

POSTER PRESENTATIONS

Economic Comparison of Refuge and Non-Refuge Cotton – Steven W. Martin[1], Ken Paxton[2], Fred Cooke[1] and Kelly Bryant[3], (1)Mississippi State Univ., Stoneville, MS, (2)LSU, Baton Rouge, LA, (3)Univ. of Arkansas, Monticello, AR

An Evaluation of Three Production Systems for No-Till Cotton in the Mississippi Delta – Fred Cooke, Gordon Andrews and Steven W. Martin, Mississippi State Univ., Stoneville, MS

Profitability of Cotton Production in the Texas High Plains from 1996 to 2003 – Ginger Elaine Sides, Phillip Johnson, Alyssa Irlbeck and Darcie Schmidt, Texas Tech Univ., Lubbock, TX

Today's Cotton Producers – Who Are They? – Jeanne M. Reeves, Cotton Incorporated, Cary, NC, A. Blake Brown, North Carolina State Univ., Raleigh, NC, George B. Frisvold, Univ. of Arizona, Tucson, AZ and Kenneth Paxton, Louisiana State Univ., Baton Rouge, LA

Texas-Oklahoma Producer Cotton Market Summary: 2003/2004 – Mohamadou L. Fadiga, Dane Sander, Sukant Misra and Don Ethridge, Texas Tech Univ., Lubbock, TX

Economic Effect of Late Irrigation on Mid-South Cotton – Robert Hogan, Univ. of Arkansas, Keiser, AR

Comparison of Strip-Till and Conventional Cotton Production Systems In Georgia – W. Don Shurley, Univ. of Georgia, Tifton, GA

Status of Precision Agriculture Technology Adoption by Louisiana Cotton Farmers – Huizhen Niu, Deepti R. Chikkam and Kenneth W. Paxton, LSU, Baton Rouge, LA

Thursday Afternoon, January 6

COTTON ENGINEERING-SYSTEMS CONFERENCE

Sheraton Grand Ballroom E

Presiding: Bradley K Fritz, USDA, ARS, AWPMRU, College Station, TX

1:00 **Establishing Different Cotton Water Levels Using Temperature-Time Thresholds** – Donald F. Wanjura and Dan R. Upchurch. USDA-ARS, Lubbock, TX

1:15 **A Real-Time Smart Sensor Array for Scheduling Irrigation** – George Vellidis, Michael Tucker, and Craig Kvien. Biological & Agricultural Engineering Department, Univ. of Georgia, Tifton, GA

1:30 **Cotton Model Simulation of Applied Water-Yield Relations for the Texas High Plains** – R. W. Clouse and S. W. Searcy. Texas A&M Univ., College Station, TX

1:45 **Variable-Rate Lateral Irrigation System** – Ahmad Khalilian, Young Han, Sam Moore, Tom Owino, and Burhan Niyazi. Clemson Univ., Edisto Research & Education Center, Blackville, SC

2:00 **Comparison of Subsurface Drip Irrigation Uniformity Designs on Cotton Production** – James P. Bordovsky, Texas Agricultural Experiment Station, Plainview, TX and Dana O. Porter, Texas Cooperative Extension, Lubbock, TX

2:15 **Using Precision Agriculture Techniques to Improve Irrigation Recommendations** – Earl D Vories, USDA-ARS, Delta Center, Portageville, MO and Sreekala G. Bajwa, Univ. of Arkansas, Biological & Agricultural Engineering, Fayetteville, AR

2:30 **Soil Water, Evapotranspiration and Irrigation in the Mid-South** – Daniel K. Fisher and James E. Hanks. USDA Agricultural Research Service, Stoneville, MS

2:45 **Evaluation of a 15-Inch Spindle Harvester in Various Row Patterns; Two Years' Progress** – Michael Herbert Willcutt[1], Eugene P. Columbus[1], Normie W. Buehring[2], M.P. Harrison[2], and Robert R. Dobbs[2]. (1) Mississippi State Univ., Ag. & Bio. Engineering, Mississippi State, MS, (2) North Mississippi Research and Extension Center, Verona, MS

3:00 **Break**

3:15 **Lint Yield and Plant Characteristics as Influenced by Spindle Picker Narrow and Wide Row Patterns** – N. W. Buehring, M. H. Willcutt, A. F. Ruscoe, J. B. Phelps, and E. P. Columbus. Mississippi State Univ., Verona, MS

3:30 **Harvesting Cost per Acre, 4 & 6 Row Current Systems Versus 6 Row Picker with Onboard Module Builder** – David W. Parvin, Mississippi State Univ., Mississippi State, MS

3:45 **Instantaneous Accuracy of Cotton Yield Monitors During Steady-State and Step-Input Conditions** – Calvin Perry and George Vellidis. Univ. of Georgia Bio & Ag Engineering, Tifton, GA

4:00 **Plant Height Impacts on Spindle Picked Lint Quality** – Stephen W Searcy, Texas A&M Univ., College Station, TX

4:15 **Whole-Farm Cost Analysis of Alternate Spindle Picker Systems** – Stan R. Spurlock, Normie W. Buehring, and Michael H. Willcutt. Mississippi State Univ., Mississippi State, MS

4:30 **Design and Evaluation of an Operator Feedback System for the Module Builder** – Robert G. Hardin IV and Stephen W. Searcy. Texas A&M Univ., Dept. of Biological and Agricultural Engineering, College Station, TX

4:45 **Sensing Cotton Nitrogen Status in Real Time** – J. Alex Thomasson and Ruixiu Sui. Mississippi State Univ., Mississippi State, MS

5:00 **Adjourn**

Thursday Afternoon, January 6

COTTON GINNING CONFERENCE

Sheraton Grand Ballroom D

Presiding: Sid Brough, President, National Cotton Ginners Association, Edroy, TX

1:00 **Quality of the Crop** – William Gibson, USDA, AMS, Cotton Program, Memphis, TN

1:15 **Advancements in USDA Cotton Classification** – Darryl Earnest, USDA, AMS, Cotton Program, Memphis, TN

1:30 **New Lint Cleaner for Reduced Fiber Loss** – W. Stanley Anthony, U.S. Cotton Ginning Laboratory, Stoneville, MS

1:45 **Lint Cleaning Performance of Modified Cylinder Cleaners** – Sanh Le, Agriculture Research Service-USDA, Stoneville, MS

2:00 **Initial Evaluation of a Modified Cylinder-Type Cleaner for Seed Cotton** – Samuel Ray, USDA, ARS, Cotton Ginning Laboratory, Stoneville, MS and W. Stanley Anthony, U.S. Cotton Ginning Laboratory, Stoneville, MS

2:15 **Evaluation of Modern High-Capacity Gin Stand and Lint Cleaner Performance** – Ross D. Rutherford, Donald W. Van Doorn, and Joe W. Thomas. Lummus Corporation, Lubbock, TX

2:30 **Origin of Seed Coat Fragments in Ginned Lint** – James Clifton Boykin, USDA, ARS, Cotton Ginning Laboratory, Stoneville, MS

2:45 **Investigation of the Effects of Lint Cleaning Machinery Loading on Fiber Quality at a Commercial Roller Gin** – Derek P. Whitelock, Carlos B. Armijo, and S. Ed Hughs. USDA-ARS, Southwestern Cotton Ginning Laboratory, Las Cruces, NM

3:00 **Break**

3:15 **Real Time Leaf Grade Measurement** – Dennis Steele, Continental Eagle, Prattville, AL

3:30 **Ginning a Fragile Seed Coat Cotton** – Carlos B. Armijo[1], Ed Hughs[1], Edward M. Barnes[2], and Marvis Gillum[1]. (1) USDA-ARS, Southwestern Cotton Ginning Laboratory, Las Cruces, NM, (2) Cotton Incorporated, Cary, NC

3:45 **Results from Optimization Studies Performed on the Powered Roll Gin Stand - Report I** – Greg A. Holt, USDA-ARS, Lubbock, TX

4:00 **Motorized Grid Bar in a Lint Cleaner Enhance Lint Value** – Mike Gvili, ASCI, Maynard, MA and Marty Northern, Northern / Lucus Co., Lubbock, TX

4:15 **Developments of Instrument Based Leaf Grade** – Steve Grantham, USDA, AMS, Cotton Program, Memphis, TN

4:30 **IsoTester: Advanced Color + Trash Measurements for Gin Process Control and for Classing** – Frederick M. Shofner, Schaffner Technologies, Inc, Knoxville, TN

4:45 **Preliminary Data on Fiber Properties of Newly Harvested Versus Weathered Cotton** – Richard K. Byler, USDA-ARS, Stoneville, MS

5:00 **Adjourn**

Thursday Afternoon, January 6

COTTON IMPROVEMENT CONFERENCE

Marriott La Galerie 6

Presiding: Robert Wright, Texas Tech Univ., Lubbock, TX

1:00 **Development of a Screening Method for Drought Tolerance in Cotton Seedlings** – Polly S. Longenberger, C. Wayne Smith, and Peggy M. Thaxton. Texas A&M Univ., Department of Soil and Crop Sciences, College Station, TX

1:15 **Differential Watering Regimes as a Means to Evaluate Drought Tolerance Among Selected Cotton Lines** – Kermit Price, Bayer CropScience, Lubbock, TX

1:30 **Identifying Discriminating Environments for Variety Selection in Louisiana** – Sterling B. Blanche[1], Gerald O. Myers[2], W. D. Caldwell[2], James Hayes[2], and J. I. Dickson[2]. (1) LSU Agcenter / Cotton Inc., Baton Rouge, LA, (2) LSU Agcenter, Baton Rouge, LA

1:45 **Breeding for Fusarium Wilt (Fov) Race 4 Resistance in Cotton** – Mauricio Ulloa[1], Robert Hutmacher[2], Mike R. Davis[3], Richard Percy[4], Michael R. McGuire[4], and Brian Marsh[5]. (1) USDA-ARS,, Cotton Enhancement Program, Shafter, CA, (2) Univ. of California, Shafter CA, Shafter, CA, (3) Univ. of California - Davis, CA, (4) USDA-ARS, Maricopa, AZ, (5) Univ. of California, Shafter, CA

2:00 **Resistance to Reniform Nematode in Exotic Cotton Lines** – J. Macon LaFoe II[1], Johnie N. Jenkins[2], Jack C. McCarty Jr.[2], Osman A. Gutierrez[2], and A. Forest Robinson[2]. (1) Mississippi State Univ., Department of Plant and Soil Sciences, Mississippi State, MS, (2) USDA-ARS, Mississippi State, MS

2:15 **Evaluation of Fatty Acid Composition of Cotton Germplasm and Association with Cold Tolerance** – Anna J. Hall and John R. Gannaway. Texas Agricultural Experiment Station, Lubbock, TX

2:30 **Theoretical Aspects of Improving Cotton Using Random Mating** – Clay B. Cole[1], Daryl T. Bowman[1], Osman A. Gutierrez[2], Johnie N. Jenkins[2], Jack C. McCarty Jr.[2], and Clarence E. Watson[3]. (1) North Carolina State Univ., Raleigh, NC, (2) USDA-ARS, Mississippi State, MS, (3) MAFES, Mississippi State Univ., Mississippi State, MS

2:45 **Development of Breeding Populations In Cotton Through Random Mating** – Osman A. Gutierrez[1], Johnie N. Jenkins[1], Jack C. McCarty[1], Daryl T. Bowman[2], and Clarence E. Watson Jr.[3]. (1) USDA-ARS, Mississippi State, MS, (2) North Carolina State Univ., Department of Crop Science, Raleigh, NC, (3) Mississippi State Univ., MAFES, Mississippi State, MS

3:00 **Break**

Presiding: Jane K. Dever, Bayer CropScience, Lubbock, TX

3:30 **Influence of Yield Components on Stability in Cotton** – Brenda F. Owens and Ted P. Wallace. Mississippi State Univ., Mississippi State, MS

3:45 **Mixed Model Based Conditional Analysis for Complex Traits** – Jixiang Wu, Johnie N. Jenkins, and Jack C. McCarty. USDA-ARS, Mississippi State, MS

4:00 **Using GGE Biplot to Identify Ideal Test Sites for Evaluating Fiber Quality** – Dawn E. Fraser and Cynthia C. Green. Delta and Pine Land Company, Hartsville, SC

4:15 **Yield and Fiber Quality of Transgenic vs. Conventional Cotton Varieties in the Arkansas Cotton Variety Tests, 1995-2004** – Sarah Jackson and Fred Bourland. Univ. of Arkansas, , Keiser, AR

4:30 **Stability of Yield and Fiber Quality in the North Delta: I. Evaluation of Methods** – Ron McNew[1], Owen Gwathmey[2], Chism Craig[2], Bobby Phipps[3], and Fred Bourland[1]. (1) Univ. of Arkansas, Fayetteville, AR, (2) Univ. of Tennessee, Jackson, TN, (3) Univ. of Missouri, Portageville, MO

4:45 **Stability of Yield and Fiber Quality in the North Delta: II. Comparison of Varieties** – Fred Bourland[1], Bobby Phipps[2], Chism Craig[3], Owen Gwathmey[3], and Ron McNew[1]. (1) Univ. of Arkansas, Keiser, AR, (2) Univ. of Missouri, Portageville, MO, (3) Univ. of Tennessee, Jackson, TN

5:00 **Increasing Genetic Diversity in Germplasm Developed by Cotton Improvement Laboratory** – Peggy Thaxton and C. Wayne Smith. Texas A&M Univ., Dept. of Soil and Crop Sciences, College Station, TX

5:15 **Effects of Mild Acid and Heat on Glycan Oligomers from Developing Cotton Fibers** – Allen K. Murray, Glycozyme, Inc., Irvine, CA and Robert L. Nichols, Cotton Incorporated, Cary, NC

5:30 **Adjourn**

POSTER PRESENTATIONS – SEE PAGES 32–33

Thursday Afternoon, January 6

COTTON INSECT RESEARCH AND CONTROL CONFERENCE

Marriott Grand Ballroom Acadia & Bissonet

SESSION A

Presiding: Timothy J. Dennehy, Univ. of Arizona, Tucson, AZ

1:00 **Cotton Insect Loss Estimates – 2004** – Michael R. Williams, Mississippi State Univ. Extension Service, Mississippi State, MS

1:15 **Effect of Bt (Cry1Ab) Corn on Corn Earworm (=bollworm) Biology: Emphasizing the Subsequent Generation's Response to Bt (Cry1Ac) Cotton** – John J. Adamczyk Jr, Jeff Gore, Carlos Blanco, and Craig Abel. USDA, ARS, SIMRU, Stoneville, MS

1:30 **Benefits and Risks of Single-Row, In-Field Refuges Versus External Block Refuges of Non-Bt Cotton in Arizona** – Timothy J. Dennehy[1], Gopalan Unnithan[1], Sarah Brink[1], Brook Wood[1], Bruce Tabashnik[1], Yves Carriere[1], Randy Norton[1], Larry Antilla[2], and Mike Whitlow[2]. (1) Univ. of Arizona, Department of Entomology, Tucson, AZ, (2) Arizona Cotton Research & Protection Council, Phoenix, AZ

1:45 **Plant Bugs and Their Management in Tennessee** – S. D. Stewart, West Tennessee Experiment Station, Jackson, TN

2:00 **Field and Laboratory Performance of WideStrike™ Insect Protection Against Secondary Lepidopteran Pests** – M. M. Willrich, L. B. Braxton, J. S. Richburg, R. B Lassiter, V. B. Langston, R. A. Haygood, J. M. Richardson, F. J. Haile, R. M. Huckaba, J. W. Pellow, G. D. Thompson, and J. P. Mueller. Dow AgroSciences, Indianapolis, IN

2:15 **Field Evaluation of VipCot™ against Heliothines Under Natural and Artificial Infestations** – Tony Burd, Brad Minton, Scott Martin, Gary Cloud, and Dave Dickerson. Syngenta, Leland, MS

2:30 **Bollgard vs. Conventional Cotton in North Carolina in 2004: Year of the Stink Bug** – Jack S. Bacheler and Dan W. Mott. North Carolina State Univ., Raleigh, NC

2:45 **2004 Performance of Bollgard II® Across the Cotton Belt** – Walt Mullins and D. Pitts. Monsanto, Memphis, TN

3:00 **Break**

Presiding: Donald Cook, Louisiana State Univ., St. Joseph, LA

3:30 **New Isolates of the Entomopathogenic Fungus, *Beauveria bassiana*, for Control of Tarnished Plant Bug, *Lygus lineolaris* in Wild Host Plants and Cotton** – Jarrod E. Leland[1], Michael R. McGuire[2], Jeff Gore[1], and Stefan T. Jaronski[1]. (1) USDA-ARS-SIMRU, Stoneville, MS, (2) USDA-ARS, Shafter, CA

3:45 **Parasitism of Soybean Loopers, Pseudoplusia includens, in Bollgard and non-Bt Cotton** – John R. Ruberson, Univ. of Georgia, Dept. of Entomology, Tifton, GA

4:00 **Mechanical and Chemical Termination of Late-Season Cotton** – Shoil M. Greenberg[1], John W. Norman[2], Joe M. Bradford[1], Randy J. Coleman[1], Alton N. Sparks[2], Charles Stichler[3], and Allen T. Showler[1]. (1) ARS-USDA, Weslaco, TX, (2) Texas Cooperative Extension, Weslaco TX, Weslaco, TX, (3) Texas Cooperative Extension, Uvalde TX, Uvalde, TX

4:15 **Effect of a Sorghum Trap Crop on the Southern Green Stink Bug, *Nezara viridula* and its Parasitoid, *Trichopoda pennipes*, in Cotton** – Glynn Tillman, USDA, ARS, Tifton, GA

4:30 **Evaluation of Selected Insecticides against Tarnished Plant Bug in Louisiana Cotton** – D. R. Cook, E. Burris, D. R. Burns, and B. R. Leonard. LSU AgCenter Northeast Research Station, St. Joseph, LA

4:45 **Managing *Lygus hesperus* in an Ecological Context in the San Joaquin Valley of California** – Peter B. Goodell and Kris Lynn. Cooperative Extension, Univ. Calif., Kearney Ag Center, Parlier, CA

5:00 **Adjourn**

POSTER PRESENTATIONS – SEE PAGES 33–34

Thursday Afternoon, January 6

COTTON INSECT RESEARCH AND CONTROL CONFERENCE

Marriott Mardi Gras Ballroom Salons F, G & H

SESSION B

Presiding: Kelly Tindall, LSU Agricultural Center, Winnsboro, LA

1:00 **Boll Weevil Eradication Update – Arkansas, 2004** – Danny Kiser and Michael Catanach. Arkansas Boll Weevil Eradiction Program, Little Rock, AR

1:15 **Longevity and Trapping Comparisons of Standard Grandlure with the Super Formulation for Boll Weevils in the Rio Grande Valley of Texas** – J. Scott Armstrong, Dale W. Spurgeon, and Charles Suh. USDA, ARS, Area Wide Pest Management Research Unit, Weslaco, TX

1:30 **Texas Boll Weevil Eradication Report** – Charles T. Allen, Lindy W. Patton, Larry E. Smith, and Richard O. Newman. Texas Boll Weevil Eradication Foundation, Abilene, TX

1:45 **The Economics of Various Cotton Technologies in the Eastern Tenn. Valley** – Larry L. Walker, Walker Cotton Technical Services, Flintville, TN

2:00 **Bandedwinged Whiteflies in the Texas Rolling Plains** – J. E. Slosser[1], M. N. Parajulee[2], and D. L. Hendrix[2]. (1) Texas Agricultural Experiment Station, Vernon, TX, (2) Texas Agricultural Experiment Station, Lubbock, TX

2:15 **Survey and Seasonal Evaluation of the Spiders of Cotton in New Mexico** – C. Scott Bundy, Paul Smith, and David Richman. New Mexico State Univ., Department of Entomology, Plant Pathology, and Weed Science, Las Cruces, NM

2:30 **Pink Bollworm Eradication in Texas – A Progress Report** – Larry E. Smith, Charles T. Allen, S. E. Herrera, and Lindy W. Patton. Texas Boll Weevil Eradication Foundation, Abilene, TX

2:45 **Effect of Tillage System and Planting Date on Seasonal Abundance of Predacious Ground Beetles in Cotton** – Ram B. Shreatha and Megha N. Parajulee. Texas Agricultural Experiment Station, Lubbock, TX

3:00 **Break**

Presiding: Victor Mascarenhas, Syngenta, Leland, MS

3:30 **Factors Influencing Honeydew Deposition by Cotton Aphid and Silverleaf Whitefly and Incidence of Sticky Cotton in California Cotton** – Larry D. Godfrey[1], Kevin E. Keillor[1], Dominic D. Reisig[1], and Richard R. Lewis[2] (1) Univ. of California, Davis, Department of Entomology, Davis, CA, (2) Univ. of California, Davis, Shafter, CA

3:45 **Influence of Planting Date and Cultivar on Lygus Bug Activity in Cotton** – Apurba K. Barman, Megha N. Parajulee, and Ram B. Shrestha. Texas Agricultural Experiment Station, Lubbock, TX

4:00 **Diamond: Mode of Action on Tarnished Plant Bugs and Efficacy Overview from 2004** – R. Tim Weiland, Crompton Corporation, Middlebury, CT

4:15 **Influence of Irrigation Method and Tillage System on Cotton Fleahopper Activity** – Walter A. Albeldano, Jeffrey E. Slosser, Megha N. Parajulee, David G. Bordovsky, Ram B. Shrestha, and John W. Sij. Texas Agricultural Experiment Station, Lubbock, TX

4:30 **Impact of Tillage Systems on Thrips Populations** – Gary Lentz and B. A. Hanks. West Tennessee Experiment Station, Jackson, TN

4:45 **Bollgard® II: A Step Change in the Right Direction - Improvements in Efficacy and Spectrum Against Lepidopteran Pests of Cotton** – Sakuntala Sivasupramaniam, Lisa G. Ruschke, Jason A. Osborn, Mark E. Oppenhuizen, John T. Greenplate, and Walt J. Mullins. Monsanto, Saint Louis, MO

5:00 **Adjourn**

Thursday Afternoon, January 6

COTTON INSECT RESEARCH AND CONTROL CONFERENCE

Marriott Mardi Gras Ballroom Salon E

SESSION C

Presiding: Jeff Gore, USDA, ARS, SIMRU, Stoneville, MS

1:00 **Survey and On-Farm Trials to Evaluate Thresholds and Impact of Hemipteran Species in Virginia Cotton** – Ames Herbert and Sean Malone. Virginia Tech, Tidewater Agric. Res. and Ext. Ctr., Suffolk, VA

1:15 **Tarnished Plant Bug Sampling and Management in the Mississippi Delta** – Jeff Gore, USDA, ARS, SIMRU, Stoneville, MS and Angus Catchot, Mississippi State Univ., Starkville, MS

1:30 **Efficacy of Diamond for Tarnished Plant Bug Control in Northeast Arkansas** – Don P. Harlan, Mid-South Ag Research, Inc., Proctor, AR and Robert D. Hinkle, Crompton Corporation, Hernando, MS

1:45 **Bidrin® Reregistration Update and Labelling for 2005 Use Season** – Paul D. Vaculin, AMVAC Chemical Corporation, Collierville, TN

2:00 **TRIMAX™: Assisting Cotton Growers in Yield Maximization** – J. Alan Hopkins, Keith Vodraska, Richard Rudolph, and John Bell. Bayer CropScience, Greenbrier, AR

2:15 **Rainfastness and Residual Activity of Flonicamid on Cotton** – Dennis W. Long, J.T. Bahr, P.E. Rensner, and K. Treacy. FMC Corporation, Sparks, GA

2:30 ***Euschistus quadrator* (Hemiptera: Pentatomidae): A New Pest in Lower Texas Gulf Coast Cotton** – Bradley W. Hopkins, Hopkins Ag Services, College Station, TX

2:45 **Field and Laboratory Tests of Diamond 0.83 EC, a new IGR, and Other Insecticides and Varietal Response to Insects In the Mississippi Delta** – James Robbins, Delta Research and Extension Center, Mississippi State Univ., MAFES, Stoneville, MS, Stoneville, MS and Robert Hinkle, Crompton Corp., Hernando, MS

3:00 **Break**

Presiding: Jack S. Bacheler, North Carolina State Univ., Raleigh, NC

3:30 **A Boll Diameter-Based, Dynamic Action Threshold for Managing Stink Bugs** – Jack S. Bacheler and Daniel W. Mott. North Carolina State Univ., Raleigh, NC

3:45 ***Lygus hesperus* Dispersal** – J. S. Bancroft. USDA-ARS, Shafter, CA

4:00 **Carbine™ – A New Insecticide for Foliar Pest Management in Cotton** – Kristine M. Treacy and Terry Mize, FMC Corporation, Corpus Christi, TX

4:15 **Impact of Boll Feeding Bugs on Lint Yield and Fiber Quality** – Phillip Roberts[1], Craig Bednarz[1], and Jeremy Greene[2]. (1) Univ. of Georgia, Tifton, GA, (2) Univ. of Arkansas, Monticello, AR

4:30 **Australian Cotton - IRM and IPM** – Jonathan Holloway, Bayer CropScience Pty. Ltd, Narrabri, Australia

4:45 **Adjourn**

Thursday Afternoon, January 6

COTTON PHYSIOLOGY CONFERENCE

Marriott La Galeries 4 & 5

SESSION A

Presiding: Alexander Stewart, LSU Agricultural Center, Alexandria, LA

1:00 **Welcoming Remarks**

1:15 **Life Among the Cotton Roots** – Bobbie McMichael, USDA-ARS, Lubbock, TX

1:45 **Presentation of the 2004 Research Award in Physiology**

2:00 **Phenological and Morphological Components of Cotton Crop Maturity** – Craig W. Bednarz, Tifton, GA and Robert L. Nichols, Cary, NC

2:15 **Varietal Response to Planting Date and Plant Density** – Chism Craig and C. Owen Gwathmey, Univ. of Tennessee, Jackson, TN

2:30 **Partitioning and Yield Responses of Contrasting Cultivars to Potassium Nutrition** – C.O. Gwathmey, C.C. Craig, Jr., J.D. Clement and C.E. Michaud, Univ. of Tennessee, Jackson, TN

2:45 **Nitrogen Fertility and Planting Date Effects on Lint Yield and Cry1Ac (Bt) Endotoxin Production** – William T. Pettigrew and John A. Adamczyk, USDA-ARS, Stoneville, MS

3:00 **Break**

Presiding: Randy Boman, Texas Cooperative Extension, Lubbock, TX

3:30 **The Influence of Micronaire Estimation and Heat Unit Accumulation on Defoliation Timing** – Frank E. Groves, W.C. Robertson and M.L. Cordell, Univ. of Arkansas Cooperative Ext, Monticello, AR

3:45 **Lint Yield and Quality Associated With Varying Defoliation Levels of Stripper Harvested Cotton** – Randy Boman[1], Mark Kelley[1] and Alan Brashears[2], (1)Texas Cooperative Extension, Lubbock, TX, (2)USDA-ARS, Lubbock, TX

4:00 **Cotton Management and Defoliation Following Late Season Hail Damage** – P. A. Clay, Univ. of Arizona, Phoenix, AZ and E. Taylor, Phoenix, AZ

4:15 **Effects of Harvest Aids on Late-Season Hailed on Cotton in the Texas High Plains** – Tommy Doederlein, Randy Boman, Mark Kelley and Mark Stelter, Texas Cooperative Extension, Lamesa, TX

4:30 **Harvest Efficiency of Three Cotton Varieties with Varying Storm Tolerance** – John T. Fowler, Delta and Pine Land Co., Tifton, GA and Ken E. Lege, Delta and Pine Land Co., Piedmont, AL

4:45 **Alternative Products for Chemical Cotton Stalk Destruction near Urban Areas** – Stephen D. Livingston, Roy D. Parker, Jeffrey R. Stapper and Lawrence L. Falconer, Texas Cooperative Extension, Corpus Christi, TX

5:00 **Break**

5:15 **Business Meeting**

6:00 **Adjourn**

POSTER PRESENTATIONS – SEE PAGES 34–35

Thursday Afternoon, January 6

COTTON PHYSIOLOGY CONFERENCE SESSION

Marriott La Galerie 3

SESSION B

Presiding: Thomas Barber, Mississippi State Univ., Mississippi State, MS

3:30 **Double-Row 30 Inch Cotton in California: Long-Term Summary** – Bob Hutmacher[1], S. D. Wright[1], R. N. Vargas[1], B. H. Marsh[1], D. S. Munk[1], B. L. Weir[1], M. P. Keeley[1], G. Banuelos[1], T. Martin-Duvall[1] and Henry Wu[2], (1)Univ. of California, Shafter, CA, (2)Monsanto Corporation, Fresno, CA

3:45 **Evaluation of Factors Affecting Replant Decisions** – Bobby Phipps, Andrea Phillips and Bobby Tanner, Univ. of Missouri, Portageville, MO

4:00 **Replanting a Skippy Stand – How Bad Does It Have to Be?** – Philip H. Jost, Univ. of Georgia, Statesboro, GA and Alexander Stewart, LSU Agricultural Center, Alexandria, LA

4:15 **Wide-Row Cotton Production in the Mississippi Delta** – Steve P. Nichols, H. R. Robinson, C. E. Snipes and T. Evans, Delta Research and Extension Center, Stoneville, MS

4:30 **Effect of Plant Population Densities on 15-Inch Row Cotton** – David G. Wilson, Keith L. Edmisten and Alan C. York. North Carolina State Univ., Raleigh, NC

4:45 **Adapting a Two Row John Deere 9910 to Harvest 15 Inch Cotton for Small Plot Research** – J. E. Lanier, G. S. Hamm, G. D. Collins, N. G. Bullins, A. P. Gardner, A. C. York, D. G. Wilson Jr. and K. L. Edmisten. North Carolina State Univ., Raleigh, NC

5:00 **Adjourn**

COTTON QUALITY MEASUREMENTS CONFERENCE

Marriott Balconies M & N

Presiding: Michael Watson, Cotton Incorporated, Cary, NC

1:00 **Welcoming Remarks** – Eric Hequet, International Textile Center, Texas Tech Univ., Lubbock, TX

1:05 **Introductory Remarks** – Joseph G. Montalvo, USDA-ARS-SRRC, New Orleans, LA

1:15 **Commercial Standardization of Instrument Testing of Cotton: How Soon a Reality?** – Terry P. Townsend, International Cotton Advisory Committee, Washington, DC

1:35 **International Developments in Cotton Classification** – James Knowlton, USDA, AMS, Cotton Program, Memphis, TN

1:55 **Discussion**

2:00 **Measurement of Discounts in Graded Cotton Using Large Area Sampling** – Michael Lieberman, USDA-ARS-SWCGRL, Mesilla Park, NM, Murali Siddaiah, Mesilla Park, NM, S.E. Hughs, USDA-ARS, Mesilla Park, NM and James Knowlton, USDA, AMS, Cotton Program, Memphis, TN

2:15 **Sampling Issues For Cotton Fiber Quality Measurements; Part 2: Impact on Cotton Testing Instrument Results** – Jean-Paul Gourlot[1], Edward Gerardeaux[1], Richard Frydrych[1], Gérard Gawrysiak[1], Philippe Francalanci[1], Eric Goze[1], Jean-Yves Drean[2] and Rui Liu[2], (1)Cirad, Montpellier, France, (2)ENSITM, Mulhouse, France

2:30 **FQEL: Laboratory Data Validation** – Jacqueline H Campbell, Christopher D. Delhom and Devron P. Thibodeaux, USDA, ARS, SRRC, New Orleans, LA

2:45 **Evaluation of Shaffner Technology Isotester** – Gretchen Deatherage, USDA, AMS, Cotton Program, Memphis, TN

3:00 **Break**

Presiding: Marc Renner, ENSITM, Mulhouse, France

3:30 **In Search of the Mystic Cotton Fiber Maturity: A View from the Microscope** – Wilton R. Goynes, Southern Regional Research Center, New Orleans, LA

3:45 **The Between Instrument Performance of Two Upgraded FMT Machines** – G.R.S. Naylor, A. M. Abbott, B. Aspros and S. R. Lucas, CSIRO, Belmont, Victoria, Australia

4:00 **Micronaire, Maturity and Fineness Research** – Joseph G. Montalvo and Terri VonHoven, USDA-ARS-SRRC, New Orleans, LA

4:15 **A Survey of the Interference Colours Transmitted by Mature and Immature Cotton Fibre Under Polarised Light Microscopy** – S.G. Gordon and N. L. Phair, Belmont, Victoria, Australia

4:30 **A Comparison of Cotton Maturity by Different Methods** – Iwona Frydrych and Malgorzata Matusiak, Institute of Textile Architecture, Lodz, Poland

4:45 **Update on Cottonscan: An Instrument for Rapid and Direct Measurement of Fibre Maturity and Fineness** – G.R.S. Naylor and M. Purmalis, CSIRO, Belmont, Victoria, Australia

5:00 **Analysis of Cotton Fibers Cross Sections** – Eric Hequet and Bobby Wyatt, International Textile Center, Texas Tech Univ., Lubbock, TX

5:15 **Adjourn**

POSTER PRESENTATIONS

Discussion on Current Situation of Cotton Quality in China – Zongwei Xiong, Cotton Research Institute,Chinese Academy of Agricultural Sciences, Anyang Henan, China

Reflections on Cotton Color and Quality by Planting Date – Linda B. Kimmel, USDA-ARS-Southern Regional Research Center, New Orleans, LA

Examination of Fiber Neps Çount During Yarn Manufacturing – Gonca Ozcelik and Erhan Kirtay, Ege Univ., Yzmir, TN, Turkey

COTTON SOIL MANAGEMENT AND PLANT NUTRITION CONFERENCE

Marriott Mardi Gras Ballroom Salons A, B & C

Presiding: Donald J. Boquet, LSU Agricultural Center, Winnsboro, LA

1:00 **Introductory Remarks**

1:15 **Frequency of In-Row Subsoiling Necessary for Coastal Plains Soils** – Randy L. Raper[1], E.B. Schwab[1], K.S. Balkcom[1] and D.W. Reeves[2], (1)USDA-ARS, Auburn, AL, (2)USDA-ARS, Watkinsville, GA

1:30 **Potential for Soil Carbon Sequestration in Cotton Production Systems of the Southeastern USA** – H.J. Causarano[1], A.J. Franzluebbers[2], D.W. Reeves[2], J.N. Shaw[1] and M.L. Norfleet[3], (1)Auburn Univ., Auburn, AL, (2)USDA-ARS, Watkinsville, GA, (3)USDA NRCS RIAD, Temple, TX

1:45 **Accumulation of Organic Matter in Soil Under Long-Term Conservation Management** – G. A. Breitenbeck, LSU Agricultural Center, Baton Rouge, LA and D. J. Boquet, Winnsboro, LA

2:00 **Tillage and Rotation Effects on Cotton Yield and Quality on Two Soils** – Philip J. Bauer[1], James R. Frederick[2], Charles E. Curtis[3] and Bruce A. Fortnum[2], (1)USDA, ARS, SAA! Florence, SC, (2)Clemson Univ., Florence, SC, (3)Clemson Univ., Clemson, SC

2:15 **Use of Poultry Litter as a Fertilizer Source in No-tillage Cotton Production** – M. W. Shankle[1], H. Tewolde[2], T. F. Garrett[1], K. R. Sistani[3], A. Adeli[2] and D. E. Rowe[2], (1)Mississippi State Univ., Pontotoc, MS, (2)USDA-ARS, Mississippi State, MS, (3)USDA-ARS, Bowling Green, KY

2:30 **Sod-Based Rotations for Cotton/Peanut in the Southeast U.S** – David L. Wright, James J. Marois, P. J. Wiatrak and T. W. Katsvairo, Univ. of Florida, Quincy, FL

2:45 **Influence of Bahiagrass on Cotton Roots in Sod Based Peanut/ Cotton Cropping Systems** – Tawainga W. Katsvairo, David L. Wright, James J. Marois and Pawel J. Wiatrak, Univ. of Florida, Quincy, FL

3:00 **Discussion**

3:15 **Break**

Presiding: Michael M. Kenty, Helena Chemical Company, Collierville, TN

3:30 **Effects of Increasing Nitrogen Fertilizer Rates in Conservation Tillage Cotton** – Charles H. Burmester, Auburn Univ., Belle Mina, AL

3:45 **Do We Need to Adjust Nitrogen Rates for Cotton in a Cotton/ Soybean Rotation?** – David J. Dunn, Phipps Bobby, Gene Stevens and Phillips Andrea, Univ. of Missouri-Delta Center, Portageville, MO

4:00 **Residual Soil Nitrogen Evaluations in Irrigated Soils of the Desert Southwest** – E. Randall Norton, Univ. of Arizona, Solomon, AZ, Jeffrey C. Silvertooth, Univ. of Arizona, Tucson, AZ and Abraham Galadima, Tucson, AZ

4:15 **Evaluation of Nitrogen Management with Pentia Growth Regulator for Cotton Following Corn in Rotation** – M. Wayne Ebelhar, Steve P. Nichols and Davis R. Clark, Mississippi State Univ., Stoneville, MS

4:30 **Discussion**

4:45 **Business Meeting**

5:30 **Adjorn**

POSTER PRESENTATIONS

Application of GIS and Hydraulic Modeling for Runoff and Sediment Reductions in Arkansas Delta Agriculture – Larry G. Stauber[1], William H. Baker[2], Michael Daniels[3] and Jennifer M. Worlow[2], (1)UAP, State Univ., AR, (2)Arkansas State Univ., State Univ., AR, (3)Univ. of Arkansas, State Univ., AR

Effects Upon Cotton Yield Through the Utilization of Growth Stimulants (PGR's) Applied Post-Emergence – Gary Shafer, Phoenix Technologies, Lawrence, KS

Summary of Applied Research Activities in Cotton by the Extension Soils Program During 2004 – Leo Espinoza, William Robertson and Paul Ballantyne, Univ. of Arkansas Cooperative Extension Service, Little Rock, AR

Processing Multispectral Imagery to Assess Cotton Growth and Development – Jennifer M. Worlow[1], Amy B. Greenwalt[2], William H. Baker[2] and Michael Person[1], (1)Univ. of Arkansas, State Univ., AR, (2)Arkansas State Univ., State Univ., AR

Utilization of Selected Seed Treatments to Enhance Cotton Production – Michael M. Kenty, Helena Chemical Company, Collierville, TN, Donald D. Howard, D and D Research Consulting, Jackson, TN, Tom Blythe, S-L Agri-Development, Senatobia, MS, Charlie Guy, G & H Associates, Inc., Tillar, AR, Michael T. McCarty, Carolina Ag Research Service, Inc., Elko, SC and Roger L. Bowman, Helena Chemical Company, Memphis, TN

Spatial Variability of Cotton Yield and Soil Properties in a Recently Disturbed Land – M Mozaffari[1], D. M. Oosterhuis[2], J. S. McConnell[3], K. R. Brye[2], N. A. Slaton[2] and C. Kennedy[1], (1)Univ. of Arkansas, Marianna, AR, (2)Univ. of Arkansas, Fayetteville, AR, (3)Univ. of Arkansas, Monticello, AR

Adjusting Planting Rates to Meet Variable Conditions – William H. Baker, Clinton Walter Jayroe, Michael Person and Amy Greenwalt, Arkansas State Univ., State Univ., AR

Broiler Litter Application Timing and Rye Winter Cover Crop on Cotton Yield and Soil N Dynamics – Ardeshir Adeli[1], Haile Tewolde[1], Dennis E. Rowe[1] and Karamat R. Sistani[2], (1)ARS-USDA, Mississippi State, MS, (2)ARS-USDA, Bowling Green, KY

Ammonia Emissions from Variable Rate Nitrogen Applications in Cotton – Matt Beene, Charles Krauter and Bruce Roberts, California State Univ., Fresno, Fresno, CA

Remote Sensing of Cotton N Status Using Hyperspectral Radiometry – Ermson Z. Nyakatawa, Chandra K. Reddy and David A. Mays, Alabama A&M Univ., Huntsville, AL

Fiber Quality Increase and Accelerated Maturity from Late Season Foliar Applied Plant Foods – Robert C. Wilbur, GroBetter LLC, Texas, WY and Gary K. Shafer, Phoenix Technologies, Lawrence, KS

Yield and Economics of Monocrop Cotton vs. Crop Diversification – Donald J. Boquet[1], Ernest L. Clawson[2], Alphonse B. Coco[2], Jay Caylor[3], Clay Shivers[2] and Kenneth W. Paxton[4], (1)LSU Agricultural Center, Winnsboro, LA, (2)LSU AgCenter, St. Joseph, LA, (3)LSU Agcenter Macon Ridge Res. Stn., Winnsboro, LA, (4)Dept. of Bio. and Agricultural Eng, Baton Rouge, LA

Cotton Response and Soil Property Changes with Long-Term Tillage Intensities – John E. Matocha, S.G. Vacek and M.P. Richardson, Texas Agricultural Experiment Station, Corpus Christi, TX

Field Evaluation of In-Furrow and Surface-Band Application of Equity Soil Ammendment for Cotton Production – M. Wayne Ebelhar, Gabe L. Sciumbato and Davis R. Clark, Mississippi State Univ., Stoneville, MS

Fifty Years of Soil Testing for Cotton in Alabama – Kevin B. Holland and Charles Mitchell, Auburn Univ., Auburn Univ., AL

Effects of Foliar Nutrition On Lint Yield and Quality Across Seven Varieties in Southwest Kansas – Gary Shafer, Phoenix Technologies, Lawrence, KS

Two Year Evaluation of CoRoN® Based Nutritional Systems for Cotton Production – Michael M. Kenty[1], Roger L. Bowman[2], Donald D. Howard[3], J.C. Banks[4], Shane Osborne[4], Tom Blythe[5], Normie Buehring[6], Mark P. Harrison[6], Robert R. Dobbs[6], Charlie Burmester[7], Jim Camberato[8], Chism Craig[9], David Dunn[10], Willaim E. Stevens[10], Daniel Fowler[11], Cary Green[12], Glen Harris[13], Merritt Holman[14], John E. Matocha[15], J. Scott McConnell[16], A.M. Stewart[17] and Bill L. Weir[18], (1)Helena Chemical Company, Collierville, TN, (2)Helena Chemical Company, Memphis, TN, (3)D and D Research Consulting, Jackson, TN, (4)Oklahoma State Univ., Altus, OK, (5)S-L Agri-Development, Senatobia, MS, (6)Mississippi State Univ., Verona, MS, (7)Auburn Univ., Belle Mina, AL, (8)Clemson Univ., Florence, SC, (9)Univ. of Tennessee, Jackson, TN, (10)Univ. of Missouri - Delta Center, Portageville, MO, (11)NC State Univ., Raleigh, NC, (12)Texas Tech Univ., Lubbock, TX, (13)Univ. of Georgia, Tifton, GA, (14)Arkansas Crop Technologies, Lonoke, AR, (15)Texas A & M Univ., Corpus Christi, TX, (16)Univ. of Arkansas, Monticello, AR, (17)LSU AgCenter, Winnsboro, LA, (18)Univ. of California, Merced, CA

Comparison of Secondary and Micro-Nutrient Distribution and Availability in Soil Under Conservation and Conventional Management for 17 Years – G.A. Breitenbeck, LSU AgCenter Dep. of Agronomy, Baton Rouge, LA and D.J. Boquet, LSU AgCenter, Winnsboro, LA

Lack of Incorporation Reduces Benefits of Poultry Litter Applied to No-Till Cotton – H. Tewolde[1], M. W. Shankle[2], K. R. Sistani[3], D.E. Rowe[1] and A. Adeli[1], (1)USDA-ARS, Mississippi State, MS, (2)Mississippi State Univ., Pontotoc, MS, (3)USDA-ARS, Bowling Green, KY

Influence of Conservation Tillage and Cover Crops on Soil Moisture and Leaf Cotton Temperature – Francisco Arriaga, Kipling S. Balkcom and Randy L. Raper, USDA-ARS, Auburn, AL

Comparison of Band and Broadcast Application of Broiler Litter to Cotton – Shalamar Armstrong[1], Haile Tewolde[2], T. Way[3], D. Rowe[4], K. Sastani[5] and R. W. Taylor[1], (1)USDA-ARS, Normal, AL, (2)USDA- ARS, Mississippi State, MS, (3)USDA-ARS, Auburn, AL, (4)USDA-ARS, Mississippi State, MS, (5)Western Kentucky Univ., Bowling Green, KY

Thursday Afternoon, January 6

COTTON UTILIZATION CONFERENCE

Marriott Balcony L

RESEARCH OVERVIEW

Presiding: Dean Ethridge, International Textile Center - Texas Tech Univ., Lubbock, TX

1:00 **Chairman's Opening Remarks/Welcome from Industry** - K.Q. Robert and J.D. Rowland

1:15 **Overview of the Cotton Market** - Gary M. Adams, National Cotton Council, Memphis, TN

1:30 **Overview of Cotton-Based Nonwovens** - Gajanan S. Bhat, Univ. of Tennessee, Knoxville, TN

1:45 **Defining the Processing Value of Cotton** - Kearny Q. Robert, USDA, ARS, SRRC, New Orleans, LA

2:00 **Strategic Directions for Cotton Utilization** - Mark A. Messura, Cotton Incorporated, Cary, NC

2:15 **Specific Research and Quality Issues for Cotton Utilization** - James E. Rodgers, USDA-ARS-SRRC, New Orleans, LA

2:30 **Ginning Research Issues for Utilization** - W. Stanley Anthony, U.S. Cotton Ginning Laboratory, Stoneville, MS

2:45 **Genetic Development of a Value-Added Fiber Through Breeding and Biotechnology** - Roy G. Cantrell, Cary, NC

3:00 **Break**

TEXTILE SPINNER/BREEDER SYMPOSIUM

Presiding: William R. Meredith, USDA-ARS, Stoneville, MS

3:30 **Can Cotton be Bred for Utility Value?** - O. Lloyd May, Univ. of Georgia, Tifton, GA and David McAlister, USDA-ARS, Clemson, GA

3:45 **Variability of Cotton Fiber and Yarn Properties Across Planting Dates** - Gayle H. Davidonis, New Orleans, LA and Donald J. Boquet, LSU Agricultural Center, Winnsboro, LA

4:00 **D&PL Variety Development - Matching Textile Mill and Grower Expectations** - Tom Kerby[1], Dave Albers[2], Ken Lege[3], Tom Speed[2] and Kevin Howard[1], (1)Delta and Pine Land Company, Scott, MS, (2)Delta and Pine Land Company, Lubbock, TX, (3)Delta and Pine Land Company, Piedmont, AL

4:15 **Fiber Quality Profiles of New Stoneville and NexGen™ Varieties** - David S. Guthrie and Lloyd L. McCall, Emergent Genetics, Inc., Memphis, TN

4:30 **Origin of the Cotton Fiber Leng** - Kearny Q. Robert, USDA, ARS, SRRC, New Orleans, LA

4:45 **Certified Fibermax Cotton™ Program: Quality Bringing Value from Breeder to Spinner** - Brent Crossland, Monty Christian and Jane K. Dever, Bayer CropScience, Lubbock, TX

5:00 **Adjourn**

POSTER PRESENTATION

Blending of Cotton Fiber Samples - Kearny Q. Robert, Melissa C. Dunn and Fabian A. Cosenza, USDA, ARS, SRRC, New Orleans, LA

Thursday, January 6

COTTON UTILIZATION CONFERENCE

Marriott Bacchus

NONWOVENS SYMPOSIUM

Presiding: D.V. Parikh, SRRC, New Orleans, LA

3:30 **Chairman's Opening Remarks** - D. V. Parikh, SRRC, New Orleans, LA

3:35 **Welcome Address** - Andrew G. Jordan, National Cotton Council, Memphis, TN

3:40 **Greetings** - John W. Radin, USDA-ARS, Beltsville, MD

3:45 **Keynote Address: New Solvent for Cellulose Extrusion** - Roy Broughton, Auburn Univ., Auburn, AL

4:10 **Enhancement of Cotton-Containing Barrier Fabrics with Breathable Films and of Face Masks with Protective Finishes for Safety from Biological Threats** - Larry C. Wadsworth and Peter P. Tsai, Univ. of Tennessee, Knoxville, TN

4:35 **Product Development in Wet Wipes** - Jim Robinson, Hygenitec, LLC, Green Bay, WI

5:00 **Adjourn**

Thursday, January 6

COTTON WEED SCIENCE RESEARCH CONFERENCE

Marriott Grand Ballroom Carondelet

Presiding: A. Stanley Culpepper, Univ. of Georgia, Tifton, GA

12:55 **Welcoming Remarks**

1:00 **Weed Management in Strip Tillage Cotton** - Barry J. Brecke and Daniel Stephenson IV, Univ. of Florida, Milton, FL

1:15 **Control of Cutleaf Eveningprimrose in Conservation Tillage Cotton** - Alan C. York, NC State Univ., Raleigh, NC and A. Stanley Culpepper, Univ. of Georgia, Tifton, GA

1:30 **Effects of Clarity, Distinct and 2,4-D on Cotton Growth and Yield** - John Everitt and Wayne Keeling, Texas Agricultural Experiment Station, Lubbock, TX

1:45 **Biology and Ecology of Tropical Spiderwort (*Commelina benghalensis*)** - Michael G. Burton and Alan C. York, NC State Univ., Raleigh, NC

2:00 **Planting Date Affects Tropical Spiderwort (*Commelina benghalensis*)-Free Interval In Cotton** - Theodore M. Webster[1], A. Stanley Culpepper[1], J. T. Flanders[2] and Timothy L. Grey[1], (1)Univ. of Georgia, Tifton, GA, (2)Univ. of Georgia, Cairo, GA

2:15 **Controlling Tropical Spiderwort with Roundup Ready Flex Systems** - J. T. Flanders, Univ. of Georgia, Cairo, GA, A. Stanley Culpepper, Univ. of Georgia, Tifton GA, GA, T. M. Webster, United States Department of Agriculture, Tifton, GA and Alan C. York, N. C. State Univ., Raleigh, NC

2:30 **Managing Tropical Spiderwort (*Commelina benghalensis*) in a Twenty-Four Acre on Farm Cotton Trial** - Will D. Duffie, Univ. of Georgia, Dawson, GA, A. Stanley Culpepper, Univ. of Georgia, Tifton, GA, Alan C. York, N. C. State Univ., Raleigh, NC and Wilson H. Faircloth, USDA-NPRL, Dawson, GA

2:45 **Will a Directed Layby Herbicide Application Be Needed Once Roundup Ready Flex Cotton Is Commercialized?** - A. Stanley Culpepper, Univ. of Georgia, Tifton, GA and Alan C. York, N. C. State Univ., Raleigh, NC

3:00 **Break**

GRADUATE STUDENT COMPETITION BEGINS

Presiding: Theodore M. Webster, Tifton, GA

3:30 **Weed Competition and Management in Roundup Ready Flex Cotton** - B.L. Joy, J. W. Keeling, P. A. Dotray and J. D. Everitt, Texas Agricultural Experiment Station, Lubbock, TX

3:45 **The Identification and Mechanism of Resistance to Clethodim in a Johnsongrass (*Sorghum halepense*) Biotype** - Ian C. Burke, James D. Burton and John W. Wilcut, North Carolina State Univ., Raleigh, NC

4:00 **Managing Weeds With Gyphosate and Complimentary Herbicides in Roundup Ready Flex Cotton** - Derek M. Scroggs, LSU AgCenter, Dean Lee Research Station, Alexandria, LA and Donnie K. Miller, LSU AgCenter, Northeast Research Station, St. Joesph, LA

4:15 **Annual Grass Control with Ignite and Graminicides** - Andrew P. Gardner[1], Alan C. York[1] and A. Stanley Culpepper[2], (1)N. C. State Univ., Raleigh, NC, (2)Tifton, GA

4:30 **Tolerance and Economics of Replanted Cotton and Spanish Peanut to Soil-applied Cotton Herbicides** - Z.H. Braden[1], P.A. Dotray[1], J.W. Keeling[1], K.M. McCormick[1] and T.A. Baughman[2], (1)Texas Agricultural Experiment Station, Lubbock, TX, (2)Texas Agricultural Experiment Station, Vernon, TX

4:45 **LibertyLink® Cotton: An Economic Comparison to Roundup Ready and Conventional Cotton** - K.M. McCormick, P.A. Dotray and J.W. Keeling, Texas Agricultural Experiment Station, Lubbock, TX

5:00 **Adjourn**

POSTER PRESENTATIONS – SEE PAGE 35

Friday, January 7

COTTON DISEASE COUNCIL

Marriott Mardi Gras Ballroom Salon D

Presiding: Charles Overstreet, Louisiana State Univ., Baton Rouge, LA

8:00 **Tolerance of Popular Cotton Varieties to the Reniform Nematode** - G. L. Sciumbato[1], Salliana R. Stetina[2] and Lawrence D. Young[2], (1)Delta Research and Extension Center, Mississippi State Univ., Stoneville, MS, (2)USDA ARS MSA Crop Genetics and Production Research Unit, Stoneville, MS

8:15 **Using a Minimum Tillage, Telone Applicator to Manage Cotton Nematodes in Morehouse Parish, Louisiana** - Terry L. Erwin[1], Charles Overstreet[2], Maurice Wolcott[2] and Richard M. Letlow[3], (1)LSU Agricultural Center, Bastrop, LA, (2)Dept. of Plant Pathology and Crop Physiology, Baton Rouge, LA, (3)LSU Agricultural Center, West Monroe, LA

8:30 **Telone Application Against Root-Knot Nematode in Tensas Parish, Louisiana During 2004** - Charles Overstreet[1], Gene Burris[2], G. Boyd Padgett[3], Maurice Wolcott[1], Donald R. Cook[3], David Sullivan[3] and Robert L. Goodson[4], (1)Dept. of Plant Pathology and Crop Physiology, Baton Rouge, LA, (2)Northeast Research Station, St. Joseph, LA, (3)Louisiana State Univ., Winnsboro, LA, (4)LSU Agricultural Center, St. Joseph, LA

8:45 **Effect of Crop Rotation at Plant and Foliar Nematicides on Cotton Yield and Reniform Nematode Populations. A Seven Year Summary of Results in Southwest Georgia** - Jack Royal, Royal's Agricultural Consulting Service Inc., Leary, GA and Glenn Hammes, DuPont Crop Protection Products, Blairsville, GA

9:00 **Regional Evaluation of Two Harpin Proteins Applied to Seed and Foliage for Their Effect on the Root-Knot Nematode in Cotton** - Gary W. Lawrence, Mississippi State Univ., MS, Kathy S. Lawrence, Auburn Univ., Auburn, AL, Terry L. Kirkpatrick, Univ. of Arkansas, Hope, AR, John D. Mueller, Clemson Univ., Blackville, SC and Ned M. French, Eden Bioscience, Corp., Little Rock, AR

9:15 **Reniform Nematode Resistance from *Gossypium longicalyx* - Cytogenetics of Introgression Products** - Nilesh Deoram Dighe[1], David M. Stelly[1], Forest Robinson[2] and Alois A Bell[2], (1)Texas A&M Univ., College Station, TX, (2)USDA-College Station, College Station, TX

9:30 **Variable Rate Applications of Telone II on Cotton for Reniform Nematode Management** - Gerry R. Ellis[1], G.W. Lawrence[1], S.A. Samson[1], W.A. Givens[1] and K.S. Lawrence[2], (1) Mississippi State Univ., Mississippi State, MS, (2)Auburn Univ., Auburn, AL

9:45 **Effect of *Rotylenchulus reniformis* on Commercial Transgenic and Non-Transgenic Cotton Cultivars** - Stanley R. Usery[1], Kathy S. Lawrence[1], Auburn Univ., Auburn, AL, Charles H. Burmester[2], Kathryn Glass[1], Randy Akridge[1], Brad Meyer[1] and Gary Lawrence, (1)Auburn Univ., Auburn, AL,(2)Auburn Univ., Belle Mina, AL, (3) Mississippi State Univ., Mississippi State, MS

10:00 **Break**

Presiding: W. Scott Monfort, Univ. of Arkansas, Fayetteville, AR

10:30 **Effect of Delayed Infection by the Root-knot Nematode on Damage to Cotton** - Mario Penteado, Faculdade de Ciencias Agronomicas - UNESP - Campus de Botucatu, Botucatu-Sao Paulo, Brazil, Terrence L. Kirkpatrick, Univ. of Arkansas, Hope, AR and Joshua A. Still, Univ. of Arkansas, Fayetteville, AR

10:45 **The Cumulative Effect of Moderately-Resistant Cotton on *Meloidogyne incognita* Population Densities after Two Years** - Richard F. Davis, USDA-ARS, Tifton, GA

11:00 **Lethal Dose Response of *Meloidogyne incognita* and *Rotylenchulus reniformis* to Abamectin** - T. R. Faske and J. L. Starr, Texas A&M Univ., College Station, TX

11:15 **Transfer of Reniform Nematode Resistance from Diploid Cotton Species to Tetraploid Cultivated Cotton** - Carlos Augusto Avila and James Mac Stewart, CSES Univ. of Arkansas, Fayetteville, AR

11:30 **Evaluating Cotton Nematicide Response Across Soil Electrical Conductivity Zones Using Remote Sensing** - Maurice Wolcott[1], Charles Overstreet[1], Eugene Burris[2], G. Boyd Padgett[3], Donald Cook[2], David Sullivan[2] and Robert Goodson[4], (1)LSU Department of Plant Pathology and Crop Physiology, Baton Rouge, LA, (2)LSU Agricultural Center, Northeast Research Station, St. Joseph, LA, (3)Louisiana State Univ., Winnsboro, LA, (4)LSU Agricultural Center, St. Joseph, LA

11:45 **Spread of Reniform Nematode (*Rotylenchulus reniformis*) in a Southeastern Arkansas Cotton Field Over a Three-Year Period** - W. Scott Monfort, Univ. of Arkansas, Fayetteville, AR and T. L. Kirkpatrick, Univ. of Arkansas, Hope, AR

12:00 **Adjourn**

Presiding: Kathy S. Lawrence, Auburn Univ., Auburn, AL

1:00 **Response of Cotton Varieties to In-Furrow Applications of Temik 15G in Fields Infested with Southern Root-Knot Nematode in Virginia** - P. M. Phipps, Virginia Tech, Suffolk, VA and J. D. Eisenback, Virginia Tech, Blacksburg, VA

1:15 **Comparative Biocontrol Efficacies of "P" and "Q" Strains of *Trichoderma virens*** - Charles R. Howell and Lorraine S. Puckhaber, USDA ARS, CPRU, College Station, TX

1:30 **Role of Field History in Developing a Decision-Aid for the Use of In-Furrow Fungicides** - Michelle L. Schulz, Craig S. Rothrock, Univ. of Arkansas, Fayetteville, AR and Patrick D. Colyer, LSU AgCenter, Bossier City, LA

1:45 **Update of 2004 Fusarium Hardlock Research in Florida** - James J. Marois, David L. Wright and Pawel J. Wiatrak, Univ. of Florida, Quincy, FL

2:00 **Efficacy of Farmsaver TM85 WDG for Control of Hardlock** - William W. Bonnette[1], Jonathan K. Croft[1], Michael A. Jones[2] and John D. Mueller[1], (1)Clemson Univ., Blackville, SC, (2)Clemson Univ., Florence, SC

2:15 **Evaluations of Planting Date, Variety Response and Selected Fungicides on Cotton Boll Rot in South Alabama** - Kathy S. Lawrence[1], Gary W. Lawrence[2], Kathy M. Glass[1], Stan R. Usery, Jr.[1], Jarrod R. Jones[1], Malcomb Pegues[1] and C. Dale Monks[1], (1)Auburn Univ., Auburn, AL, (2)Mississippi State Universtiy, Mississippi State, MS

2:30 **Relationship of Thrips to Fusarium Hardlock** - Daniel J. Mailhot, James J. Marois and David L. Wright, Univ. of Florida, Quincy, FL

2:45 **Isolation of Cottonseed-Rotting *Pantoea* spp. from Stink Bugs and Plant Bugs** - Alois Bell, Juan Lopez, Jesus Esquivel, Enrique Medrano and Jack Mauney, Southern Plains Agricultural Research Center, College Station, TX

3:00 **Break**

Presiding: Kenneth Seebold, Univ. of Georgia, Tifton, GA

3:30 **Characterizing Boll Damage** - Robert Loring Nichols[1], Steven M. Brown[2], Michael A. Jones[3], B. Rogers Leonard[4], G. Boyd Padgett[5], David L. Wright[6], James J. Marois[6] and Melissa Willrich[7], (1)Cotton Incorporated, Cary, NC, (2)Univ. of Georgia, Tifton, GA, (3)Clemson Univ., Florence, SC, (4)Louisiana State Univ., Baton Rouge, LA, (5)Louisiana State Univ., Winnsboro, LA, (6)Univ. of Florida, Quincy, FL, (7)DowAgroSciences, Greenville, MS

3:45 **Results from the 2004 Regional Hardlock Project - Effects on Disease and Yield** - Kenneth Seebold and Robert Kemerait, Univ. of Georgia, Tifton, GA

4:00 **Topsin® M, a Foliar Fungicide for Cotton Production** - Beth E. Sears, Phil Robinson, Tony Estes and Stephen Lee, Cerexagri, Inc., King of Prussia, PA

4:15 **Adjourn**

Friday, January 7

COTTON ECONOMICS AND MARKETING CONFERENCE

Marriott La Galeries 1 & 2

Presiding: Mark A. Messura, Cotton Incorporated, Cary, NC

8:00 **Upland Loan Schedule Premiums and Discounts and Market Prices** – Steve Neff, USDA Farm Service Agency, Washington, DC

8:15 **2004 Quality Incentives Paid by Mills** – Conrad P. Lyford and Sangnyeol Jung, Texas Tech Univ., Lubbock, TX

8:30 **An Estimated 2004 Texas-Oklahoma Pre-Season Price Schedule Based on Market History** – Mohamadou L. Fadiga, Sukant Misra and Don Ethridge, Texas Tech Univ., Lubbock, TX

8:45 **Has E-Commerce Changed the Price Behavior in the Cotton Cash and Futures Markets?** – Gerald Plato and Leslie A. Meyer, USDA-ERS, Washington, DC

9:00 **The Impact of Exchange Rates on World Cotton Prices** – Stephen MacDonald, USDA, Economic Research Service, Washington, DC

9:15 **Effects of Chinese Currency Appreciation in the World Cotton Market** – Suwen Pan, Samarendu Mohanty and Don Ethridge, Texas Tech Univ., Lubbock, TX

9:30 **Cost of Production in the U.S. and Other Countries** – Rafiq M. Chaudhry, International Cotton Advisory Committee, Washington, DC

9:45 **Is West Africa Competitive with the U.S. on the World Cotton Market?** – Gerald L. Estur, International Cotton Advisory Committee, Washington, DC

10:00 **Break**

Presiding: Stephen MacDonald, USDA, Economic Research Service, Washington, DC

10:15 **Structural Changes in the World Cotton Market** – Carol Skelly, USDA World Agricultural Outlook Board, Washington, DC

10:30 **Trends in Retail Cotton Use in the U.S. Market** – Kim Kitchings, Kalyani Deshpande and Melissa Bastos, Cotton Incorporated, Cary, NC

10:45 **Measuring the U.S. Cotton Content of Textile and Apparel Product Imports** – Leslie A. Meyer, USDA-ERS, Washington, DC

11:00 **Analysis of Global Trends in Apparent Cotton Consumption** – Gary A. Raines and Mark A. Messura, Cotton Incorporated, Cary, NC

11:15 **Discussion**

11:30 **Adjourn**

11:45 **Business Session**

Friday, January 7

COTTON ENGINEERING-SYSTEMS CONFERENCE

Sheraton Grand Ballroom E

Presiding: Bradley K Fritz, USDA, ARS, AWPMRU College Station, TX

8:00 **Real-Time Plant Height Mapping and Variable Rate Application of Growth Regulators** – Marcelo de C. C. Stabile and Stephen W. Searcy, Texas A&M Univ., College Station, TX

8:15 **Reducing Seedcotton Losses From Field Cleaners** – Alan D. Brashears, USDA-ARS, Lubbock, TX

8:30 **Relation Between RADARSAT Imagery and Cotton Field Characteristics** – Stephan J. Maas[1], Sepalika Rajapakse[1], Robert Lascano[2], Wenxuan Guo[1], Jill Booker[2] and Jonghan Ko[1], (1)Texas Tech Univ., Lubbock, TX, (2)Texas Agricultural Experiment Station, Lubbock, TX

8:45 **The Agronomics and Economics of 15-inch Cotton** – Jarred Ray Karnei, John Deere Company, Dallas, TX

9:00 **Thermal Defoliation in 2004** – Paul A. Funk[1], Carlos Armijo[1], Allan T. Showler[2], Alan D. Brashears[3], Michael R. McGuire[4] and Robert B. Hutmacher[5], (1)USDA ARS, Mesilla Park, NM, (2)USDA-ARS, Weslaco, TX, (3)USDA-ARS, Lubbock, TX, (4)USDA-ARS, Shafter, CA, (5)Univ. of California, Shafter, CA

9:15 **Resolving the Phase Shift Ambiguity in Microwave Dielectric Properties Measurement** – Mathew Pelletier, USDA-ARS, Lubbock, TX

9:30 **Particulate Concentration Measurement at a New Mexico Cotton Gin** – Carlos Armijo[1], Derek Whitelock[1], Mike Buser[2] and Ed Hughs[1], (1) Southwest Cotton Ginning Lab, Mesilla Park, NM, (2)USDA-ARS, Lubbock, TX

9:45 **Preliminary Evaluation of the Baffle-type Pre-separator in Terms of Baffle Location, Critical Air Velocity and Loading Rate** – Michael D. Buser[1], Derek P. Whitelock[2], Greg Holt[1] and Lingjuan Wang[3], (1)USDA-ARS, Cotton Production and Processing Research Unit, Lubbock, TX, (2)USDA-ARS, Southwestern Cotton Ginning Laboratory, Las Cruces, NM, (3)Biological and Agricultural Engineering Dept., Texas A&M Univ., College Station, TX

10:00 **Break**

10:15 **Analysis of the Texas A&M Cyclone Design Method** – William Brock Faulkner and Bryan W. Shaw, Texas A&M Univ., College Station, TX

10:30 **Evaluation of Sources and Controls of Fugitive Dust from Agricultural Operations** – Daniel Adam Michalewicz, Bryan W. Shaw and John D Wanjura, Texas A&M Univ., College Station, TX

10:45 **Continued Development of Area Source Emission Factors** – Lee Barry Goodrich[1], Calvin Parnell[2] and Bryan W. Shaw[2], (1)CSU Fresno, Fresno, CA, (2)Texas A&M Univ., College Station, TX

11:00 **Road Dust Emissions and the Resulting Effects upon Downwind Samplers** – Lee Hamm[1], Dr. Calvin Parnell[1], Dr. Michael Buser[2], John Wanjura[1] and Dr. Sergio Capareda[1], (1) Texas A&M Univ., College Station, TX, (2) USDA-ARS, Cotton Production and Processing Research Unit, Lubbock, TX

11:15 **Engineering Analysis of Proposed Legislation to Establish Minimum Property Line Setback Distances for Cotton Gins** – J.D. Wanjura[1], M. D. Buser[2], D. P. Whitelock[3], S. E. Hughs[3], B. M. Norman[4], C.B. Parnell[1], B.W. Shaw[1] and R. E. Lacey[1], (1)TAMU-CAAQES, College Station, TX, (2)USDA-ARS, Lubbock, TX, (3)USDA-ARS, Mesilla Park, NM, (4)National Cotton Council, Memphis, TN

11:30 **PSD Analysis of Cotton Gin Trash and Its Impact on Concentration Measurements on FRM PM Samplers** – Sergio Capareda[1], Dr. Calvin Parnell[1], Dr. Bryan Shaw[1], John Wanjura[1], Lee Hamm[1] and Mike Buser[2], (1) Texas A&M Univ., College Station, TX, (2)USDA-ARS, Lubbock, TX

11:45 **Engineering Analysis of Dry Deposition of Particulate Matter Emitted from Cotton Gins – Particle Size Distribution of the Particulate Matter in the Downwind Plume** – Lingjuan Wang[1], Dr. Calvin Parnell[2], Dr. Sergio Capareda[2], Bryan W. Shaw[2] and R. E. Lacey[3], (1)Biological and Agricultural Engineering Dept., Texas A&M Univ., College Station, TX, (2) Texas A&M Univ., College Station, TX, (3)TAMU-CAAQES, College Station, TX

12:00 **Adjourn**

Friday, January 7

COTTON GINNING CONFERENCE

Sheraton Grand Ballroom D

Presiding: Larry McClendon, First Vice President, National Cotton Ginners Association, Marianna, AR

8:00 **Development in Cotton Classification Standards** – James Knowlton, USDA, AMS, Cotton Program, Memphis, TN

8:15 **Experience with the IsoTester and GinWizard in U.S. Gins** – Frederick M. Shofner, Kipp W. Julius and Christopher Kyle Schofner, Schaffner Technologies, Inc., Ennis, TX

8:30 **Evaluation of Short Fiber Classification** – Steve Grantham, USDA, AMS, Cotton Program, Memphis, TN

8:45 **Nep Management Study** – Martin Karl Schreiner and William D. Kimbrell, Cotton Incorporated, Cary, NC

9:00 **Panel Discussion**

10:00 **Break**

10:15 **Storage of Cotton Bales at Marginal Moisture Levels** – W. Stanley Anthony, U.S. Cotton Ginning Laboratory, Stoneville, MS and Billy Ussery, Griffin Gin Co., Helena, AR

10:30 **Precise Bale Moisture Management Starts With Precise Heat Management** – Jimmy C. Reed, Cotton Moisture, LLC, Oxford, MS

10:45 **Fiber Quality Changes Due to Bale Moisture Addition** – Kevin Baker[1], S. E. Hughs[1] and David D. McAlister[2], (1)USDA-ARS, Mesilla Park, NM, (2)USDA-ARS, Cotton Quality Research Station, Clemson, SC

11:00 **Final Bale Moisture, A New Measurement Technique** – Joe Yankey and Mike Galyon, Uster Technologies, Knoxville, TN

11:15 **Moisture Transfer with Strip and Micropore Bale Bagging** – W. Stanley Anthony, U.S. Cotton Ginning Laboratory, Stoneville, MS

11:30 **Advanced Moisture Generation Techniques for Demanding Environments** – Mark Gentry, Samuel Jackson, Inc., Lubbock, TX

11:45 **Seed Cotton Transport and Ginning - Systems Analysis** – Shay L. Simpson, Calvin B. Parnell and Stephen W. Searcy, Texas A&M Univ., College Station, TX

12:00 **Adjourn**

Friday, January 7

COTTON IMPROVEMENT CONFERENCE

Marriott La Galerie 6

SESSION A

Presiding: David Becker, Bayer CropScience, Lubbock, TX

8:00 **Regulation of Gene Expression in the Transition from Cell Elongation to Secondary Wall Formation in Cotton Fiber** – Hee Jin Kim, Univ. of New Orleans, New Orleans, LA and Barbara A. Triplett, USDA-ARS, New Orleans, LA

8:15 **Comparative Microarray Analysis of Genes Differentially Expressed During Fiber Development of Upland and Pima Cotton** – Jinfa Zhang[1], Thea A. Wilkins[2], R. G. Cantrell[3] and Doug J. Hinchliffe[1], (1)New Mexico State Univ., Las Cruces, NM, (2)Univ. of California, Davis, CA, (3)Cotton Incorporated, Cary, NC

8:30 **Genetic and Functional Genomic Analysis of Early Events in Cotton Fiber Development** – Z. Jeffrey Chen[1], Suk Hwan Yang[1], Jinsuk J. Lee[1], Ning E. Wei[1], Barbara Triplett[2], David M. Stelly[1], Peggy Thaxton[1] and Sing-Hoi Sze[1], (1)Texas A&M Univeristy, College Station, TX, (2)USDA-ARS, New Orleans, LA

8:45 **Integrated Genetic, Physical and Comparative Mapping of the Cotton Genome** – John Z. Yu[1], Russell J. Kohel[1], Zhanyou Xu[1], Jianmin Dong[1], Hongbin Zhang[2], David M. Stelly[2], Alan E. Pepper[2], Ping Cui[1] and Steven M. Hoffman[1], (1)USDA-ARS, College Station, TX, (2)Texas A&M Univ., College Station, TX

9:00 **A Comparison of Physical Mapping Methods in Plants** – Steven M. Todd and David M. Stelly, Texas A&M Univ., College Station, TX

9:15 **QTL Mapping of Cotton Yield Components** – Gerald Myers, LSU, Baton Rouge, LA, Baogong Jiang, LSU AgCenter, Baton Rouge, LA and Muhanad W. Akash, Iowa State Univ., Ames, IA

9:30 **Germplasm Evaluation of Cotton Accessions from the U.S. Cotton Germplasm Collection, USDA-ARS (*Gossypium hirsutum* L. land-races of Mexico)** – James Frelichowski[1], Mauricio Ulloa[1], Albert Percival[2], James Stewart[3] and Roy Cantrell[4], (1)USDA-ARS, Shafter, CA, (2)USDA-ARS, College Station, TX, (3)Univ. of Arkansas, Fayetteville, AR, (4)Cotton Incorporated, Cary, NC

9:45 **Pedigree- vs. RFLP-based Genetic Similarity Estimates in Cotton** – Guillermo Van Becelaere, Edward L. Lubbers, Peng W. Chee, O. Lloyd May and Andrew H. Paterson, Univ. of Georgia, Tifton, GA

10:00 **Break**

Presiding: Don L. Keim, Delta & Pine Land Co., Scott, MS

10:30 **Ultra-Early Planting: Multiyear Results** – John M. Green and F. Linwood Roberts, SEED SOURCE, INC., Stoneville, MS

10:45 **A Century of Cotton Cultivars Grown in Varying Plant Spacings** – Brian Schwartz, C. Wayne Smith and Peggy Thaxton, Texas A&M Univ., College Station, TX

11:00 **Growth and Fruiting Habits of DP 555 BG/RR in Various Row Patterns and Plant Spacings** – Herbert T. Miller IV[1], Johnie N. Jenkins[2] and Jack C. McCarty[2], (1) Mississippi State Univ., Starkville, MS, (2) USDA, ARS, Mississippi State, MS

11:15 **Influence of Four Plant Populations on Boll Retention and Lint Yield on Four Commercial Cultivars** – Liberty Cash III[1], Johnie N. Jenkins[2] and Jack C. McCarty[2], (1)Mississippi State Univ., Starkville, MS, (2)USDA, ARS, Mississippi State, MS

11:30 **Use of Drip Irrigation and Variety Evaluation in Cotton** – Denise A McWilliams, New Mexico State Univ. Cooperative Extension Service, Las Cruces, NM

11:45 **Effects of Mepiquat Pentaborate on Genotypes of Varying Maturity** – Joseph T. Johnson, USDA-ARS, Stoneville, MS

12:00 **Lunch**

Friday, January 7

COTTON IMPROVEMENT CONFERENCE

Marriott Grand Ballroom Bissonet
SESSION B

Presiding: Gerald O. Myers, LSU Agcenter, Baton Rouge, LA

8:00 **Identification of a New Monosome in Cotton: Chromosome 21** - Dwaine A. Raska, David M. Stelly, M. Nurul Islam-Faridi and Michael E. Woods, Texas A&M Univ., College Station, TX

8:15 **The Effects of Random Mating on Introgression of Alleles from *Gossypium tomentosum* and *G. mustelinum* into *G. hirsutum*** - Brian W. Gardunia, David M. Stelly, C. Wayne Smith, Peggy Thaxton, Monica Menz and Javier Betran, Texas A&M Univ., College Station, TX

8:30 **Utilization of an Interspecific Hybrid Between *Gossypium hirsutum* and *Gossypium tomentosum* for Salt Tolerance Studies** - Sarah M Higbie[1], James McD Stewart[2], Thea Wilkins[3] and Jinfa Zhang[1], (1)New Mexico State Univ., Las Cruces, NM, (2)Univ. of Arkansas, Fayetteville, AR, (3) University of California, Davis, Davis, CA

8:45 **Detection of Reniform Nematode Resistance in Primitive Gossypium hirsutum and G. barbadense During a Survey of the U.S. National Cotton Collection and Initiation of Research to Incorporate Resistance into Agronomic Cotton** - A. Forest Robinson[1], A. C. Bridges[1], A. E. Percival[1], Osman A. Gutierrez[2], J. C. McCarty Jr[2] and J. N. Jenkins[2], (1)USDA-ARS, College Station, TX, (2)USDA-ARS, Mississippi State, MS

9:00 **Expression of the *Semigamy* Mutation in Pima Cotton: A Cytological Evaluation** - Kelly D. Biddle, George L. Hodnett and David M. Stelly, , Texas A&M Univ., College Station, TX

9:15 **Disease Resistance Conferred by the Expression of a Gene Encoding a Synthetic Peptide in Transgenic Cotton Plants** - K. Rajasekaran, J. W. Cary and T.E. Cleveland, USDA, ARS, SRRC, New Orleans, LA

9:30 **Improvement of Cotton Via Genetic Manipulation of the Chloroplast Genome** - Shashi Kumar and Henry Daniell, Univ. of Central Florida, Orlando, FL

9:45 **Effects of VIP on Selected Cotton Insect Pests in Field and Laboratory Experiments** - Johnie N. Jenkins, Jack C. McCarty, USDA, ARS, Mississippi State, MS and David Dickerson, Syngenta, Memphis, TN

10:00 **Break**

Presiding: Jodi A. Scheffler, USDA-ARS, Stoneville, MS

10:30 **Resistance to *Rhizoctonia solani* and *Alternaria alternata* in Transgenic Cotton Expressing an Endochitinase Gene from *Trichoderma virens*** - Keerti Rathore, Chandrakanth Emani, Ganesan Sunilkumar and Charles Kenerley, Texas A&M Univ., College Station, TX

10:45 **Analysis of Transgenic Cotton Engineered for Higher Drought-Tolerance in Greenhouse and in the Field** - Hong Zhang[1], Cixin He[1], Guoxin Shen[1], Juqiang Yan[1], Dick Auld[1] and Eduardo Blumwald[2], (1)Texas Tech Univ., Lubbock, TX, (2)Univ. of California at Davis, Davis, CA

11:00 **Evaluation of Sucrose Phosphate Synthase Transgenic Cotton Lines under Field Conditions in West Texas** - E. Margaret Hamill[1], C. Haigler[2], Zhang Deshui[2], Bir Singh[3], Scott Holaday[3] and Sangjoon Hwang[3], (1)Bayer CropScience, Lubbock, TX, (2)NCSU, Raleigh, NC, (3)Texas Tech Univ., Lubbock, TX

11:15 **Osmotic-Shock-Induced Gene Expression in Cotton Roots** - Bill L. Hendrix[1], James McD. Stewart[1] and Thea A. Wilkins[2], (1)Univ. of Arkansas, Fayette, AR, (2)UC Davis, Davis, CA

11:30 **From In-Silico Prediction to In-Vivo Validation: Isolating Candidate Genes to Genetically Engineer Cotton Fibers** - Sharon Ayal, Rafael Meissner, Rodrigo Yelin, Gil Ronen, Dotan Dimet and Hagai Karchi, Evogene Ltd., Rehovot, Israel

11:45 **Combining Ability Studies for Gas Exchange and Other Physiological Traits in Upland Cotton (*Gossypium hirsutum* L.) Under Drought Stress Conditions** - Mohamed Ahmed Ashour El-Dahan, Eduardo Oscar Leidi, M. Lopez and J.C Gutiérrez, Dpto. Algodón, CIFA Las Torres-Tomejil, DGIEA, Seville, Spain

12:00 **Lunch**

Friday, January 7

COTTON IMPROVEMENT CONFERENCE

Marriott La Galerie 6

Presiding: Jeff P. Klingenberg, Bayer Cotton Seed International, Sellers, SC

1:15 **Gene Action of Afis Fiber Length in Upland Cotton** - Chris Braden[1], C. W. Smith[1], Peggy Thaxton[1] and Eric Hequet[2], (1)Texas A&M Univ., College Station, TX, (2)International Textile Center, Texas Tech Univ., Lubbock, TX

1:30 **Correlation Study of Fiber Density in Cotton Between Wildtype and the N_1 Naked-Seed Mutant** - Christian Sayre Hans, Brian W. Gardunia, Z. Jeffrey Chen and David M. Stelly, Texas A&M Univ., College Station, TX

1:45 **A Better Understanding of the Number of Fibers per Seed in Cotton** - Leigh Dawdy Cranmer, USDA, Seminole, TX

2:00 **Breeding New FiberMax Varieties with Improved Lint Yield and Premium Fiber for the Southeastern USA** - Jeff P. Klingenberg, Bayer Cotton Seed International, Sellers, SC

2:15 **Fundamentals of FiberMax Breeding: Successfully Combining High Yield with Preferred Fiber Quality** - Steve Hague, Bayer Cotton Seed International, Leland, MS

2:30 **Boll Samples, Grab Samples and Commercially Ginned Bales: a Texas High Plains Comparison** - John R. Gannaway[1], Randy Boman[2], Mark Kelley[2], Eric Hequet[3] and Robert Nichols[4], (1)Texas Agricultural Experiment Station, Lubbock, TX, (2)Texas Cooperative Extension, Lubbock, TX, (3)International Textile Center, Texas Tech Univ., Lubbock, TX, (4)Cotton Incorporated, Cary, NC

2:45 **Evaluation of Laboratory-Scale Spinning as a Prospective Tool for Cotton Breeders and Biotechnologists** - Mourad Krifa, Eric Hequet and Dean Ethridge, International Textile Center - Texas Tech Univ., Lubbock, TX

3:00 **Break**

Presiding: Steve Hague, Bayer Cotton Seed International, Leland, MS

3:30 **FiberMax® Cottonseed Performance with the LibertyLink® Herbicide Technology** - Gary Henniger[1], Jane Dever[1], David Becker[1] and Jeff Gwyn[2], (1)Bayer CropScience, Lubbock, TX, (2)Bayer Cotton Seed International, Leland, MS

3:45 **Performance of PhytoGen Cotton Varieties Expr** - R. A. Haygood[1], A. R. Parker[1], M. G. McPherson[2], J. S. Richburg[1], R. B. Lassiter[1], L. B. Braxton[1], R. M. Huckaba[1], M. M. Willrich[1], V. B. Langston[1], F. J. Haile[1], J. M. Richardson[1], G. D. Thompson[1], J. W. Pellow[3] and J. P. Mueller[1], (1)Dow AgroSciences, Indianapolis, IN, (2)PhytoGen Seed Company, Greenville, MS, (3)Phytogen Seed Company, LLC, Corcoran, CA

4:00 **Use of Multi-Trait Lateral Flow Test Strips for the Detection of Transgenic Cotton** - Michael C. Brown, Timothy S. Lawruk and James W. Stave, Strategic Diagnostics Inc., Newark, DE

4:15 **Release of Tamcot 22, TAM 96D-18, TAM 96D-69s, TAM 98D-102 and TAM 98D-99ne** - Peggy Thaxton and C. Wayne Smith, Texas A&M Univ., College Station, TX

4:30 **Cotton Improvement Business Meeting**

4:45 **Adjourn**

Friday, January 7

COTTON INSECT RESEARCH AND CONTROL CONFERENCE

Marriott Grand Ballroom Acadia
SESSION A

Presiding: S. D. Stewart, Univ. of Tennessee, West Tennessee Experiment Station, Jackson, TN

8:00 **Comparison of Simulated Insect Defoliation to Premature Harvest Aid Application on Cotton Yield Components** - Jonathan D. Siebert, B. Rogers Leonard and Alexander M. Stewart, Louisiana State Univ., Baton Rouge, LA

8:15 **Lady Beetle Species Shift in Bt and Non-Bt Cotton Fields** - Jorge B. Torres and John R. Ruberson, Univ. of Georgia, Tifton, GA

8:30 **Modeling Predictions for BT Resistance Evolution in an Eastern North Carolina *Helicoverpa zea* Population** - Ryan W. Kurtz[1], J. R. Bradley[1], Fred Gould[1] and John Van Duyn[2], (1)North Carolina State Univ., Raleigh, NC, (2)North Carolina State Univ., Plymouth, NC

8:45 **Using Farm Records to Explore Spatial and Temporal Patterns of Heliothine Distributions on Cotton in Heterogeneous Cropping Environments in Southeast Arkansas** - K. C. Allen, R. G. Luttrell and M. J. Cochran, Univ. of Arkansas, Fayetteville, AR

9:00 **Managing Stink Bug Populations in Cotton-Soybean Production Systems in Arkansas** - J. F. Smith, J. K. Greene and R. G. Luttrell, Univ. of Arkansas, Fayetteville, AR

9:15 **Generating Aerial Insecticide Prescriptions Using Cotton Yield and Crop Profit Maps** - Joshua H. Temple[1], B. R. Leonard[1], R. D. Bagwell[1], D. Magoun[2], K. Paxton[1], J. Niu[1] and E. Barham[3], (1)LSU AgCenter, Baton Rouge, LA, (2)ULM, Monroe, LA, (3)Flying Tigers Aviation, Oak Ridge, LA

9:30 **Cross Resistance Evaluations of Cry1Ac Tolerant *Heliothis virescens* Strains to the Novel Insecticidal Protein Vip3A** - Maria Marcus, J. R. Bradley, F. L. Gould and J. W. Van Duyn, North Carolina State Univ., Raleigh, NC

9:45 **Landscape Monitoring of Bollworm and Tobacco Budworm Adults in a Bollgard and Refuge Cotton System** - Rhett H. Gable[1], J. H. Temple[2], D. R. Cook[1] and B. R. Leonard[2], (1)LSU Agricultural Center, Winnsboro, LA, (2) LSU Department of Entomology, Baton Rouge, LA

10:00 **Break**

Presiding: James Robbins, Delta Research and Extension Center, Mississippi State Univ., MAFES, Stoneville, MS

10:30 ***In-vitro* Cross Resistance Studies with the Vegetative Insecticidal Protein Vip3a Support the Insect Resistance Management Strategy for VipCot™** - Eric Chen and Mi Lee, Syngenta, Research Triangle Park, NC

10:45 **Field Studies of VipCot™ Support High Dose Efficacy Towards TBW, Heliothis virescens** - Victor Mascarenhas, Tony Burd, Mike Green, Scott Martin and Brad Minton, Syngenta, Leland, MS

11:00 **Cotton Aphids Benefit Yield by Increasing Fire Ant Predation of Caterpillar Pests** - John D. Styrsky and Micky D. Eubanks, Auburn Univ., Auburn, AL

11:15 **Remote Sensing for Detection of Spider Mite and Cotton Aphid in San Joaquin Valley Cotton** - Dominic D. Reisig[1], Larry D. Godfrey[1] and Kevin E. Keillor[2], (1)Univ. of California, Davis, Davis, CA, (2)Univ. of California, Davis, Shafter, CA

11:30 **The Impact of Okra-leaf Cotton on Beneficial Insect Populations** - Tamara Booze, Scott Bundy and Jinfa Zhang, New Mexico State University, Las Cruces, NM

11:45 **VipCot™ Progress Update** - David Negrotto and Todd Martin, Syngenta, Research Triangle Park, NC

12:00 **Lunch**

1:00 **Business Meeting**

2:00 **Adjourn**

Friday, January 7

COTTON INSECT RESEARCH AND CONTROL CONFERENCE

Marriott Mardi Gras Ballroom Salons F, G & H
SESSION B

Presiding: Alan McCaffery, Syngenta, Bracknell, Berkshire, United Kingdom

8:00 **Insect Resistance Management for VipCot™** - Alan McCaffery, Lori Artim, David Negrotto, David O'Reilly, Tony Burd and Victor Mascarenhas, Syngenta, Bracknell, Berkshire, United Kingdom

8:15 **Louisiana Research Efforts with WideStrike™ and VipCot™ Pest Management Technologies** - Roger Leonard, Don Cook, Rhett Gable, Karla Emfinger, Josh Temple, Kelli Tindall and Latha Bommireddy, LSU AgCenter, Winnsboro, LA

8:30 **Activity of VipCot™ Against *Helicoverpa zea* and *Heliothis virescens* in Arkansas** - R. G. Luttrell, M. I. Ali, J. F. Smith and K. C. Allen, Univ. of Arkansas, Fayetteville, AR

8:45 **Laboratory Studies of VipCot™ Support High Dose** - David O'Reilly, Natalie Dupen, Janet Cairns, Kirsty Windle, Andy Blake and Jacqui Sheridan, Syngenta, Bracknell, Berkshire, United Kingdom

9:00 **Variation in CC Trap Catches of Thrips Associated with Different Colors With and Without Dichlorvos Cubes** - Chang-chi Chu, Matthew A. Ciomperlik, Tian-Ye Chen, Shaun Tuck, Patrick Alexander and Thomas J. Henneberry, WCRL, Phoenix, AZ

9:15 **The Relationship between Imidacloprid, Stomatal Opening and Whitefly Behavior** - Samielle K. Marklund[1], Teresa A. Hauser[1], Steven A. Kolmes[1], David B. Alexander[1], Raymond R. Bard[1], Timothy J. Dennehy[2] and Ben DeGain[2], (1)Univ. of Portland, Portland, OR, (2)Univ. of Arizona, Tucson, AZ

9:30 **The Performance of Higher Rates of Imidacloprid as a Seed Treatment on Early Season Insect Pest of Cotton** - Charles T. Graham, Gustafson, Grenada, MS

9:45 **Attraction of *Frankliniella occidentalis* to Parti-colored Lamp Array under Darkroom Conditions** - Tian-Ye Chen, Chang-chi Chu, Glenn Fitzgerald, Shaun Tuck, Patrick Alexander and Thomas Henneberry, WCRL, Phoenix, AZ

10:00 **Break**

Presiding: M. N. Parajulee, Texas Agricultural Experiment Station, Lubbock, TX

10:30 **Variable Rate of Irrigation Water and Nitrogen in Cotton: Potential of Site-Specific Management of Cotton Aphids** - Megha N. Parajulee[1], Ram B. Shrestha[1], Stanley C. Carroll[1], Padma L. Bommireddy[2], Andy M. Cranmer[3] and Kevin F. Bronson[1], (1)Texas Agricultural Experiment Station, Lubbock, TX, (2)Louisiana State Univ., Baton Rouge, LA, (3)Texas Cooperative Extension, Seminole, TX

10:45 **Technology on the Turn-row** - John R. Bassie, Bassie Ag Service, Cleveland, MS

11:00 **Building a Philosophy and Analytical Framework for Site-specific Experiments in Commercial Cotton Fields** - Jeffrey L. Willers, USDA ARS Genetics and Precision Agriculture Research Unit, Mississippi State, MS

11:15 **Larval Feeding Disruption Tests (FDT) for Monitoring Insect Resistance to Cry1Ac, Cry1F and Cry1Ab** - R. M. Roe[1], J. Van Kretschmar[1], D. M. Thompson[1], K. V. Donohue[1], C. E. Sorenson[1], G. D. Thompson[2], N. P. Storer[2], C. Blanco[3], J. D. Lopez Jr.[4], B. R. Leonard[5], John Van Duyn[6], A. Kilpatrick[7], A. Hagerty[7] and Debbie Brickle[8], (1)NC State Univ., Raleigh, NC, (2)Dow AgroSciences, Indianapolis, IN, (3)USDA-ARS, Stoneville, MS, (4)USDA-ARS, SPARC, College Station, TX, (5)LSU AgCenter, Baton Rouge, LA, (6)North Carolina State Univ., Plymouth, NC, (7)Edisto Research and Education Center, Blackville, SC, (7)Clemson Univ. Edisto Research and Education Center, Clemson, SC, (8)Monsanto Leland Agronomy Center, Leland, MS

11:30 **Monitoring for Bollworm (*Helicoverpa zea*) Pyrethroid Resistance in Texas 2004** - Patricia V. Pietrantonio[1], Terry Junek[1], Roy Parker[2], C. G. Sansone[3], Andy Cranmer[4], Greg Cronholm[5], Glen Moore[6], Dale Mott[7], Emilio Nino[8], Pat Porter[9], Kerry Siders[10] and Noel Troxclair[11], (1)Texas A&M Univ., College Station, TX, (2)Texas Cooperative Extension, Corpus Christi, TX, (3)Texas Cooperative Extension, San Angelo, TX, (4)Texas Cooperative Extension, Seminole, TX, (5)Texas Cooperative Extension, Plainview, TX, (6)Texas Cooperative Extension, Waxahachie, TX, (7)Texas Cooperative Extension, Georgetown, TX, (8)Texas Cooperative Extension, Dimmitt, TX, (9)Texas Cooperative Extension, Lubbock, TX, (10)Texas Cooperative Extension, Levelland, TX, (11)Texas Cooperative Extension, Uvalde, TX

11:45 **Measuring Bt Susceptibility in Heliothine Populations in Arkansas: Results of Third Year Studies** - M. I. Ali, R. G. Luttrell and K. C. Allen, Univ. of Arkansas, Fayetteville, AR

12:00 **Adjourn**

Friday, January 7

COTTON INSECT RESEARCH AND CONTROL CONFERENCE

Marriott Mardi Gras Ballroom Salon E
SESSION C

Presiding: G. M. Lorenz, Univ. of Arkansas CES, Little Rock, AR

8:00 **Field Efficacy of WideStrike™ Insect Protection Against Heliothine Insects** – R. M. Huckaba, L. B. Braxton, M. M Willrich, J. S. Richburg, R. B. Lassiter, V. B. Langston, R. A. Haygood, J.M. Richardson, F. J. Haile, J. W. Pellow, G. D. Thompson and J. P. Mueller, Dow AgroSciences, Indianapolis, IN

8:15 **Resistance Management Rationale and Strategy for WideStrike™ Insect** – N. N. Storer, Dow AgroSciences, Indianapolis, IN

8:30 **Performance of WideStrike™ Insect Protection for Control of Lepidopteran Pests in Alabama from 2001 through 2004** – R. H. Smith[1], R. A. Haygood[2], L. B. Braxton[2], D. P. Moore1 and A. R. Parker[2], (1)Auburn Univ., Auburn, AL, (2)Dow AgroSciences, Indianapolis, IN

8:45 **Field Efficacy of WideStrike™ Insect Protection Against Pink Bollworm** – J. M. Richardson[1], P. C. Ellsworth[2], C. S. Bundy[3], L. B. Braxton[1] and J. W. Pellow[1], (1)Dow AgroSciences, Indianapolis, IN, (2)Maricopa Agricultural Center, Maricopa, AZ, (3)New Mexico State Univ., Las Cruces, NM

9:00 **Response of Bollworm Offered Selected Plant Structures from Widestrike™ Cotton** – Don Cook[1], Roger Leonard[2], Rhett Gable[1], Karla Emfinger[2] and Kelly Tindall[2], (1)LSU Agricultural Center, St Joseph, LA, (2)LSU Agricultural Center, Winnsboro, LA

9:15 **Heliothine Control with WideStrike™ Cotton in Arkansas, 2004** – G. M. Lorenz[1], J. Hardke[1], J. K. Greene[2], C. Capps[2], K. Colwell1 and G. Studebaker[3], (1)Univ. of Arkansas CES, Little Rock, AR, (2)Univ. of Arkansas SEREC, Monticello, AR, (3)Univ. of Ark.- NEREC, Keiser, AR

9:30 **Area-Wide Management of *Helicoverpa* spp. in an Australian Mixed Cropping Agroecosystem** – David A. H. Murray, Melina M Miles, Austin J McLennan, Richard J Lloyd and Jamie E Hopkinson, Toowoomba, Australia,

9:45 **A Two-Year Study of Bollgard II in TN** – Chad E. Tritt, Crockett Farmer's Co-op, Bells, TN

10:00 **Break**

Presiding: C. Blanco, USDA, ARS, Stoneville, MS

10:30 ***Bacillus thuringiensis* Cry1Ac Resistance Monitoring Program for Tobacco Budworm and Bollworm in 2004** – Carlos A. Blanco[1], Michelle Mullen[1], Craig Abel[1], Julius R. Bradley[2], Peter Ellsworth[3], Jeremy K. Greene[4], Ames Herbert[5], Roger Leonard[6], Juan D. Lopez[7], Robert Meagher[8], William Moar[9], Megha Parajulee[10], Roy D. Parker[11], Phillip Roberts[12], John Ruberson[12], Richard Sprenkel[13], Glenn Studebaker[14], Antonio P. Teran[15], Michael Williams[16] and John Van Duyn[17], (1)USDA - Agricultural Research Service, Stoneville, MS, (2)North Carolina State Univ., Raleigh, NC, (3)Univ. of Arizona, Maricopa, AZ, (4)Univ. of Arkansas, Monticello, AR, (5)Virginia Tech, Suffolk, VA, (6)Louisiana State Univ., Winnsboro, LA, (7)USDA-ARS, College Station, TX, (8)USDA Agricultural Research Service, Gainesville, FL, (9)Auburn Univ., Auburn, AL, (10)Texas Agricultural Experiment Station, Vernon, TX, (11)Texas Cooperative Extension, Corpus Christi, TX, (12)Univ. of Georgia, Tifton, GA, (13)Univ. of Florida, Quincy, FL, (14)Univ. of Arkansas, Keiser, AR, (15)INIFAP, Ciudad Cuauhtemoc, Tamaulipas, Mexico, (16)Mississippi State Univ., Mississippi State, MS, (17)North Carolina State Univ., Plymouth, NC

10:45 **Field and Laboratory Evaluations of VIP 3A Protected Cotton Cultivars: Efficacy and Agronomics as Seed Producer Priorities** – Jay S. Mahaffey, Tom Kerby, Kevin Howard, William Smith, Alan Coskrey and Jeff Miller, Delta and Pine Land Company, Scott, MS

11:00 **Susceptibility of Four *Heliothis virescens* and *Helicoverpa zea* Reference Colonies to a Homogeneous Cry1Ac-Incorporated Insect Diet: Implications for an Area-Wide Monitoring Program** – Carlos A. Blanco[1], Ibrahim Ali[2], Sakuntala Sivasupramaniam[3], Randall Luttrell[2] and Jose L. Martinez-Carrillo[4], (1)USDA - Agricultural Research Service, Stoneville, MS, (2)Univ. of Arkansas - Fayetteville, Fayetteville, AR, (3)Monsanto, St. Louis, MO, (4)INIFAP, Ciudad Obregon, Sonora, Mexico

11:15 **Comparative Efficacy of Bt Technologies Against Bollworm in North Carolina** – Ryan E. Jackson[1], J. R. Bradley[1] and J. W. Van Duyn[2], (1)North Carolina State Univ., Raleigh, NC, (2)North Carolina State Univ., Plymouth, NC

11:30 **Effective Stewardship of Dual Effective Dose (DED) Bt Products for Insect Control** – Graham P. Head, W. Mullins and M. Edge, Monsanto, St. Louis, MO,

11:45 **Adjourn**

Friday, January 7

COTTON PHYSIOLOGY CONFERENCE

Marriott La Galeries 4 & 5
SESSION A

GRADUATE STUDENT COMPETITION BEGINS

Presiding: Ernest L. Clawson, LSU AgCenter, St. Joseph, LA

8:00 **Cotton Irrigation Timing Using Remote Sensing** – Glen L. Ritchie, Jared Whitaker, Cory Mills and Craig W. Bednarz, Univ. of Georgia, Tifton, GA,

8:15 **Broadcast Applications of Glyphosate to Glyphosate Resistant Cotton During Late Bloom Period** – Gary S. Hamm, Shaun N. Casteel, James E. Lanier, Guy D. Collins and Keith L. Edmisten, North Carolina State Univ., Raleigh, NC

8:30 **Physiological Response of Cotton to High Night Temperatures** – L. Milenka Arevalo, Derrick M. Oosterhuis, Dennis L. Coker and Robert S. Brown, Univ. of Arkansas, Fayetteville, AR

8:45 **Plant Population and Within Row Planting Configuration Effects on Cotton Growth and Yield** – Jonathan D. Siebert, Alexander M. Stewart and B. Rogers Leonard, Louisiana State Univ., Baton Rouge, LA

9:00 **Evaluation of Techniques and Screening for High Temperature Tolerance in Cotton Germplasm** – Androniki C. Bibi, Derrick M. Oosterhuis, Evangelos D. Gonias and Fred M. Bourland, Univ. of Arkansas, Fayetteville, AR

9:15 **Large Scale Comparrison of Acid Delinted and Polymer Coated Cottonseed** – D. B. Olivier, Texas Tech Univ., Lubbock, TX, N. W. Hopper, Texas Tech Univ. and Texas A&M Experiment Station, Lubbock, TX, R. K. Boman, Texas Cooperative Extension, Lubbock, TX and T. C. Wedegaertner, Cotton Incorporated, Cary, NC

9:30 **The Effect of an Upper Limit Temperature Threshold on Heat Unit Calculations, Defoliation Timing, Yield and Fiber Quality** – Dan D. Fromme[1], J. T. Cothren[2] and J. B. Bynum[2], (1)Texas Agricultural Experiment Station, Wharton, TX, (2)Texas Agricultural Experiment Station, College Station, TX

9:45 **Evaluation of PGR Properties of Trimax in Cotton** – Cy C. McGuire, J. Tom Cothren and Josh B. Bynum, Texas A&M Univ., College Station, TX

10:00 **Break**

Presiding: Steve P. Nichols, Delta Research and Extension Center, Stoneville, MS

10:15 **Effect of TRIMAX™ Insecticide on the Physiology, Growth and Yield of Cotton** – Evangelos D. Gonias, Derrick M. Oosterhuis and Androniki C. Bibi, Univ. of Arkansas, Fayetteville, AR

10:30 **Initiation and Proliferation of Gossypol-Producing Cotton Hairy Roots** – Stephanie C. Moss[1], Michael K. Dowd[2] and Barbara A. Triplett[2], (1)Univ. of New Orleans, New Orleans, LA, (2)USDA-ARS, New Orleans, LA

10:45 **Cloning and Characterization of Three ROP/Rac G- Proteins from Gossypium hirsutum** – Nicole Asprodites[1], Hee Jin Kim[1] and Barbara A. Triplett[2], (1)Univ. of New Orleans, New Orleans, LA, (2)USDA-ARS, New Orleans, LA

11:00 **Evaluation of Physiological Responses of Modern Versus Obsolete Cotton Cultivars Under Stress Environments for Explaining Yield Variability** – Robert S Brown and Derrick M. Oosterhuis, Univ. of Arkansas, Fayetteville, AR

11:15 **Plant Density Effects On Yield, Lint Quality and Last Effective Boll Populations in Cotton** – S. W. Halfmann, J. T. Cothren and J. B. Bynum, Texas A&M Univ., College Station, TX

11:30 **Optimizing Harvest-Aid Timing, Yield and Quality, By Monitoring Nodes Above White Flower and Heat Unit Accumulation** – Josh B. Bynum, Texas A&M Univ., College Station, TX

11:45 **To Experiment the Result of Plow and Duration of Irrigation for Cotton in the Dry Land** – Ali Reza Bahraminezhad, Zarand Azad Univ., Zarand-Kerman, Iran

END OF GRADUATE STUDENT COMPETITION

12:00 **Lunch**

Presiding: Ernest L. Clawson, LSU AgCenter, St. Joseph, LA

1:15 **Announcement of Graduate Student Competition Winners**

1:30 **Effect of Seed Weight Changes on Fibers Per Seed and Fiber Property Uniformity** – Gayle H. Davidonis, USDA-ARS, New Orleans, LA, William R. Meredith, USDA-ARS, Stoneville, MS and James Heitholt, Texas A&M Univ., Dallas, TX

1:45 **Impact of Harvesting and Ginning on Fiber Properties – Translating from Researcher to Producer Level Results** – Gretchen F. Sassenrath, USDA-ARS APTRU, Stoneville, MS and Gene Boggess, Mississippi State Univ., Mississippi State, MS

2:00 **Yield Component Analyses of Cotton – Genetic & Environmental Causes of Variation** – Daniel R. Krieg, Texas Tech Univ., Lubbock, TX

2:15 **A New Bioassay to Determine the Onset of Water Stress in Cotton** – John J. Burke, USDA-ARS, Lubbock, TX

2:30 **Plant Mapping Software for California Cotton** – Brian H. Marsh and Robert B. Hutmacher, Univ. of California, Shafter, CA

2:45 **Yield Prediction Based on Heat Units** – Juvencio González-García, Sergio Guerrero-Morales, Arturo J. Obando-Rodríguez and Sóstenes Delgado-García, Univ. of Chihuahua, Delicas, Mexico

3:00 **Adjourn**

Friday, January 7

COTTON PHYSIOLOGY CONFERENCE

Marriott La Galerie 3
SESSION B

Presiding: Joel C. Faircloth, Virginia Tech, Suffolk, VA

8:00 **Impact of Nitrogen and Tillage on Plant Growth Regulator Application Method** – Joel C. Faircloth, Virginia Tech, Suffolk, VA

8:15 **Pentia v Mepiquat Cloride Containing Substitutes, West Tennessee and South Mississippi Delta, 2004** – David W. Parvin, Mississippi State Univ., Miss State, MS

8:30 **Pentia ™ Plant Growth Regulator - 2004 Field Performance** – Scott Asher, BASF Corporation, Research Triangle Park, NC, Sam Atwell, BASF Corporation, Michigan City, MS, Todd Burkdoll, BASF Corporation, Visalia, CA, Tom McKemie, BASF Corporation, Raleigh, NC, Sandy Newell, BASF Corporation, Statesboro, GA, Alvin Rhodes, BASF Corporation, Madison, MS and Greg Stapleton, BASF Corporation, Dyersburg, TN

8:45 **Evaluation of TADS 15338 for Plant Growth Regulation in Cotton** – Keith W. Vodraska, Bayer CropScience, Lakeland, TN and James R. Collins, Bayer CropScience, RTP, NC

9:00 **On-Farm Evaluation of Chaperone in Arkansas** – Matt Cordell, Frank Groves and Bill Robertson, UACES, Little Rock, AR

9:15 **Effects of Chaperone on Texas Cotton** – Randy K. Boman, Todd A. Baughman, Charles R. Stichler, Stephen D. Livingston, Billy E. Warrick, Dan D. Fromme, Glen C. Moore, David J. Pigg, Jeff R. Stapper, J. Tom Cothren, Josh Bynum and Robert G. Lemon, (2)Texas A&M Univ., College Station, TX

9:30 **Plant Growth and Yield Response to Foliar Application of TRIMAXTM: A Summary of Three Years of Research** – Derrick M. Oosterhuis, Evangelos D. Gonias and Robert S. Brown, Univ. of Arkansas, Fayetteville, AR

9:45 **Increased Protein Levels, Insect Mortality and Yields with Chaperone™** – Derrick M. Oosterhuis and Robert S. Brown, Univ. of Arkansas, Fayetteville, AR

10:00 **Break**

Presiding: Robert G. Lemon, Texas A&M Univ., College Station, TX

10:30 **Mapping Spatial and Temporal Variability of Cotton Yield in West Texas** – Wenxuan Guo[1], Stephan Maas[1], Robert Lascano[2] and Jerry Brightbill[3], (1)Texas Tech Univ., Lubbock, TX, (2)Texas Agricultural Experiment Station, Lubbock, TX, (3)Brightbill Farms, Plainview, TX

10:45 **Remote Sensing for Site-Specific Management of Biotic and Abiotic Stress in Cotton** – Nyland R. Falkenberg[1], Giovanni Piccinni[1], Daniel I. Leskovar[1], J.T. Cothren[2] and Charlie M. Rush[3], (1)Texas A&M Research and Extension Center, Uvalde, TX, (2)Texas A&M Univ., College Station, TX, (3)Texas Agricultural Experiment Station, Bushland, TX

11:00 **Use of Site-Specific Data for Selection of Optimum COTMAN Sampling** – Marcelo de C. C. Stabile and Stephen W. Searcy, Texas A&M Univ., College Station, TX

11:15 **Is Interpolated, Geo-Referenced Weather Data Reliable for Predicting Cotton Development?** – Thomas J. Gerik[1], Jerry W. Stuth[2], Evelyn M. Steglich[1], Danny D. Fromme[3] and Wyatte L. Harman[1], (1)Texas A&M Univ., Temple, TX, (2)Texas A&M Univ., College Station, TX, (3)Texas Cooperative Extension, Wharton, TX

11:30 **Determining the Value of a Site-Specific Decision Support System using Aerial Photographs to Prescribe Crop Inputs for Cotton** – John Randall Nelson, North Carolina State Univ., Raleigh, NC, Ronnie Heiniger, North Carolina State Univ., Plymouth, NC and Larry Hendrickson, John Deere, Urbandale, IA

11:45 **Highlights of an Evolving Web-Based Decision Support System for Cotton** – Carlos J. Fernandez and T. Neal Trolinger, Texas Agricultural Experiment Station, Corpus Christi, TX

12:00 **Lunch**

Presiding: Chism Craig, Univ. of Tennessee, Jackson, TN

1:30 **AuxiGro® WP Effects on Low Desert Cotton Retention, Yields and Quality** – Michael D. Rethwisch, Mark Reay, Jessica Grudovich and Jessica Wellman, Univ. of California Cooperative Extension, Blythe, CA

1:45 **Overcoming Sequential Cotton Boll Sizing from the 1st to 2nd to 3rd to 4th Boll Along Lateral Branches Extending from the Main Stem of the Cotton Plant** – Albert Liptay and Jerry H. Stoller, Stoller Enterprises Inc, Houston, TX

2:00 **Observations of Wave like Oscillations of Cell Membrane and Terminal Complexes at Single Cotton Cell** – Adkhamjon A. Paiziev and Viktor A. Krakhmalev, Institute of Electronics Uzbek Academy of Science, Tashkent, Uzbekistan

2:15 **Gossypol Pathway in Cotton: Desoxyhemigossypol-4-Hydroxylase** – Jinggao Liu, Robert D. Stipanovic and Al A. Bell, USDA-ARS-SPARC, College Station, TX

2:30 **Gossypol Pathway in Cotton: Stereospecific Biosynthesis of (+)-Gossypol in Moco Cotton** – Jinggao Liu, Robert D. Stipanovic, Al A. Bell and Lorraine Puckhaber, USDA-ARS-SPARC, College Station, TX

2:45 **Analysis of an EST Database Representing Cotton Stems** – Earl W Taliercio, USDA/ARS, Stoneville, MS

3:00 **Adjourn**

Friday, January 7

COTTON QUALITY MEASUREMENTS CONFERENCE

Marriott Balconies M & N

Presiding: Iwona Frydrych, Institute of Textile Architecture, Lodz, Poland

8:00 **A Microscopic System for Automated Detection of Dead Cotton Fibers** – Yaxiong Huang and Bugao Xu, The Univ. of Texas at Austin, Austin, TX

8:15 **Neps in U.S. Cottons** – Patricia Bell, Southern Regional Research Center, ARS, USDA, New Orleans, LA

8:30 **Nep Size Distribution in Cotton During Processing** – Malgorzata Matusiak, Institute of Textile Architecture, Lodz, Poland

8:45 **Influence of Tack Test Parameters on Adhesion Energy of Some Physiological and Entomological Sugars** – Asma Amara[1], Jean-Yves Drean[1], Michel Nardin[2] and Albert Defoin[3], (1)ENSITM/LPMT, Mulhouse Cedex, France, (2)ICSI, Mulhouse Cedex, France, (3)ENSCMU/COB, Mulhouse Cedex, France

9:00 **The H2SD: Inter-Laboratory Test Results** – Eric Goze, Serge Lassus, Bruno Bachelier, Richard Frydrych and Jean-Paul Gourlot, Cirad, Montpellier, France

9:15 **Correlation Between Surface Characteristics and Honeydew Stickiness** – Narjes Rjiba[1], Asma Amara[1], Jean-Yves Drean[1] and Michel Nardin[2], (1)ENSITM, Mulhouse Cedex, France, (2)ICSI, Mulhouse Cedex, France

9:30 **Reducing Stickiness on Honeydew Contaminated Cottons Using Overspray** – Donald E. Brushwood, USDA, ARS, Clemson, SC

9:45 **An Enzymatic Process for Removal of Stickiness of Honeydew Contaminated Cottons** – Ravikrishnan Manjeri Ramakrishnan[1], Aparna Srinivasan[2] and Aditya Ravikrishnan[1], (1)Rasayan Vyapar, Coimbatore, India, (2)Rasayan Vyapar, Phoenix, AZ

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10:00 **Break**

Presiding: Devron Thibodeaux, Southern Regional Research Center, New Orleans, LA

10:30 **An Innovative Method for Measuring Objective Total Fabric Hand** – Yehia Elmogahzy, Fatma Selcen Kilinc, Monir Hassan and Ramsis Farag, Auburn Univ., Auburn, AL

10:45 **A Preliminary Report: Fuzz and Pilling Surface Changes on Cotton Fabrics Measured by LineTech Industries' Image Analysis System** – Tobias Jackson, LineTech Industries, Inc., Brooklyn, NY and Norma M. Keyes, Cotton Incorporated, Cary, NC

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11:00 **A 3D Scanning System for Fabric Fuzzing Evaluations** – Bugao Xu, The Univ. of Texas at Austin, Austin, TX

11:15 **Influence of Cotton Fiber Morphology and Spinning Process on the 3D Loop Shape of Weft Knitted Fabrics in Terms of Roughness, Thickness and Heat Transfer** – Marc Renner and Marie Ange Bueno, ENSITM, Mulhouse, France

11:30 **Evaluation of Porosity in Knitted Fabrics** – Yehia Elmogahzy[1], Bhupender S. Gupta[2], Burcak Karaguzel[2] and Fatma Selcen Kilinc[1], (1)Auburn Univ., Auburn, AL, (2)North Carolina State Univ., Raleigh, NC

11:45 **The Effect of Wet-Dry Cycles on Cotton Fiber Friction** – Gary R. Gamble, USDA-ARS-CQRS, Clemson, SC

12:00 **Lunch**

Presiding: Gary R. Gamble, USDA-ARS-CQRS, Clemson, SC

1:00 **Development of NIST - Traceable HVI color measurements** – Devron Thibodeaux[1], James Knowlton[2] and Jacqueline Campbell[1], (1)USDA, ARS, SRRC, New Orleans, LA, (2)USDA, AMS, Cotton Program, Memphis, TN

1:15 **Comparison of Small Trash Measurements between Imaging Techniques and AFIS** – Murali Siddaiah[1], S. E. Hughs[1], Michael Lieberman[1] and Jonn A. Foulk[2], (1)SWCGRL, ARS-USDA, Mesilla Park, NM, (2)USDA ARS CQRS, Clemson, SC

1:30 **CATI: Application of Image Analysis Systems for Seed Coat Fragment Detection and on Other Fibre Characterization** – Jean-Paul Gourlot[1], Lawrence Hunter[2], Mohamed Boubaker[3], Michel Giner[1] and Jean-Yves Drean[3], (1)CIRAD, Montpellier, France, (2)CSIR, Division of Textile Technology, Port Elizabeth, South Africa, (3)ENSITM, Mulhouse, France

1:45 **Trash Identification at the Card** – Jonn A. Foulk and David D. McAlister, USDA ARS CQRS, Clemson, SC

2:00 **Correlations Between Cotton Dimensional Characteristics Produced by HVI and AFIS at Different Stages of Processing** – Ramsis Farag, Auburn Univ., Auburn, AL

2:15 **Fine Study of Cotton fiber: Methodology and Feasability** – Jean-Yves Drean[1], Houda Benzina[1], Omar Harzallah[1] and Anthony Bunsell[2], (1)ENSITM, Mulhouse cedex, France, (2)ENSMP, Evry Cedex, France

2:30 **Morphological Defects of Living Cotton Hairs in Developing Cotton Boll** – Viktor A. Krakhmalev and Adkham A. Pairiev, Institute of Electronics Uzbek Academy of Science, Tashkent, Uzbekistan

2:45 **Determination of Fiber and Product Quality through Small-Scale Processing Trials: Fiber to Yarn** – C. D. Delhom, X. Cui, J. H. Campbell and D. P. Thibodeaux, USDA-ARS-SRRC, New Orleans, LA

3:00 **Break**

Presiding: G. R. S. Naylor, CSIRO, Belmont, Victoria, Australia

3:30 **Fiber Quality Variation within a Cotton Plant as Affected by Genetics and Environment** – Daniel R. Krieg and Eric F. Hequet, Texas Tech Univ., Lubbock, TX

3:45 **Field Weathering Effects on Selected Cotton Fiber Quality Parameters in the Texas High Plains** – Mark Kelley[1], Randy Boman[1], Eric Hequet[2] and Alan Brashears[3], (1)Texas Cooperative Extension, Lubbock, TX, (2)International Textile Center, Texas Tech Univ., Lubbock, TX, (3)USDA-ARS, Lubbock, TX

4:00 **Quick Summary of the Latest Moisture Restoration at the Gin Study and of a Microbial Check Study on the Population Densities on 'Discolored' and 'Clean' Cotton** – David T. W. Chun and David D. McAlister, USDA-ARS, Cotton Quality Research Station, Clemson, SC

4:15 **Concluding Remarks**

4:20 **Adjourn**

Friday, January 7

COTTON SOIL MANAGEMENT AND PLANT NUTRITION CONFERENCE

Marriott Mardi Gras Ballroom Salons A, B & C

Presiding: Gary A. Breitenbeck, Louisiana State Univ., Baton Rouge, LA

8:15 **Cotton Yield Response to N and K Management in Rotations with Corn in The Mississippi Delta** – M. Wayne Ebelhar, Davis R. Clark and H. C. Pringle III, Mississippi State Univ., Stoneville, MS

8:30 **Nitrogen, Phosphorus and Potassium Use Trends by Cotton, with an Emphasis on Potassium** – Clifford Snyder, Potash & Phosphate Institute, Conway, AR, Mike Stewart, Potash & Phosphate Institute, San Antonio, TX and Rob Mikkelsen, Potash & Phosphate Institute, Davis, CA

8:45 **Injecting Phosphoric Acid with Subsurface Drip Irrigation Systems** – Juan M. Enciso, Warren Multer and Charles Stichler, Texas A&M Univ., Weslaco, TX

9:00 **Cotton Yield and Fiber Quality for Irrigated Tillage Systems of the Tennessee Valley** – Kipling S. Balkcom[1], D. Wayne Reeves[2], Joey N. Shaw[3], Charles H. Burmester[4] and Larry M. Curtis[3], (1)USDA-ARS, Auburn, AL, (2)USDA-ARS, Watkinsville, GA, (3)Auburn Univ., Auburn, AL, (4)Auburn Univ., Belle Mina, AL

9:15 **Crop Reflectance as an Indicator of Cotton Growth and Nitrogen Availability** – Robert Earnest and Jac J. Varco, Mississippi State Univ., Mississippi State, MS

9:30 **Late Season Foliar Decline in San Joaquin Valley Cotton: Nutrient interactions** – R. B. Hutmacher[1], Steve D. Wright[2], R. N. Vargas[1], G. Stuart Pettygrove[3], B. A. Roberts[4], Joe Fabry[5] and Herman Meister[6], (1)Univ. of California, Shafter, CA, (2)Univ. of California Cooperative Extension, Tulare, CA, (3)Univ. of California, Davis, CA, (4)UCCE - Kings County, Hanford, CA, (5)Fresno, CA, (6)UC Coop Ext - Imperial Co., Holtville, CA

9:45 **Discussion**

10:00 **Break**

Presiding: J. Cheston Stevens, LSU AgCenter, Alexandria, LA

10:30 **Site-Specific Technology Can Help Build Profits--If we are willing to adapt!** – Harold F. Reetz, Foundation for Agronomic Research, Monticello, IL and Cliff Snyder, Potash & Phosphate Institute, Conway, AR

10:45 **Conditioning Irrigated Cotton Fields to Enhance Minimum Tillage Practices** – Naomi W. Assadian[1], Chrisie Moore[1], Pinhas Fine[2], David Ornelas[3], Jim Ed Miller[4] and Craig Miller[4], (1)The Texas A&M Research and Extension Center, El Paso, TX, (2)The Volcani Center, Bet-Dagan, Israel, (3)El Paso Water Utilities, El Paso, TX, (4)Miller Land and Cattle Co., Ft. Hancock, TX

11:00 **Impact of Herbicide Use on Microbial Populations and Functions in Australian Cotton Farming Systems** – V. V. S. R. Gupta, CSIRO Land and Water, Glen Osmond, Australia and Grant N. Roberts, CSIRO Plant Industry, Narrabri, Australia

11:15 **Effect of Plant Geometry and Density Related Drip Lateral Spacing on Cotton Growth and Yield** – Selvaraj Somasundaram, Agricultural College and Research Institute, Madurai, India

11:30 Discussion

11:45 Adjorn

Friday, January 7

COTTON UTILIZATION CONFERENCE

Marriott Balcony I

CHEMISTRY SYMPOSIUM

Presiding: Alfred D. French, Southern Regional Research Center, New Orleans, LA

8:00 **A New Wrinkle on Wrinkle Recovery** – Nicolette Prevost, SeChin Chang, Alexander Lambert, Paul Sawhney, D. V. Parikh, J. Vincent Edwards and Navzer Sachinvala, SRRC, New Orleans, LA

8:30 **New Epoxy Bis-Phosphonate Crosslinkers for Cotton** – SeChin Chang, Nicolette Prevost, D.V. Parikh, Paul Sawhney, Alexander Lambert, J. Vincent Edwards and Navzer Schinvala, SRRC, New Orleans, LA

9:00 **Cotton Fabric Surface Modification Using Microwave Plasma** – Noureddine Abidi and Eric Hequet, International Textile Center, Texas Tech Univ., Lubbock, TX

9:30 **Preliminary Gas Chromatograph – Mass Spectrometer Studies on Cotton Volatiles** – Marie-Alice Rousselle, Kearny Q. Robert, Steven W. Lloyd, Casey Grimm and Alfred D. French, Southern Regional Research Center, New Orleans, LA

10:00 **Break**

NEW PRODUCTS SYMPOSIUM

Presiding: J. Vincent Edwards, Southern Regional Research Center, New Orleans, LA

10:30 **Laboratory Scale Fiber and Nonwovens Production of Cotton-Clay Nanocomposites** – Leslie A. White, SRRC-ARS-USDA, New Orleans, LA

11:00 **Enhancing the Moisture Management Performance of 100% Cotton** – William A. Rearick and Vikki Martin, Cotton Incorporated, Cary, NC

11:30 **Development of a Continuous Finishing Chemistry Process For Manufacture of An Interactive Cotton Chronic Wound Dressing** – J. Vincent Edwards[1], Phyllis Howley[1], Val Yachmenev[1], Ali Salame[2] and John Gettys[2], (1)Southern Regional Research Center, New Orleans, LA, (2)DeRoyale Textiles, Camden, SC

12:00 **Adjourn**

TEXTILE TECHNOLOGY SYMPOSIUM

Presiding: Mike Rodriguez, Rieter Corporation, Spartanburg, SC

3:30 **Experimental Assessment of Cotton Fiber Behavior During Opening-Cleaning Operations** – Mourad Krifa and Eric Hequet, International Textile Center - Texas Tech Univ., Lubbock, TX

3:45 **Bale Moisture Restoration – A Second Look at Spinning Quality** – David D. McAlister, USDA-ARS, Cotton Quality Research Station, Clemson, SC, Kevin Baker, USDA-ARS, Mesilla Park, NM and Ed Hughs, Southwest Cotton Ginning Lab, Mesilla Park, NM

4:00 **What is the Role of Variety and Area of Growth in Fiber's Moisture Profile?** – Marie-Alice Rousselle, USDA-ARS-SRRC, New Orleans, LA

4:15 **Rapid Determination by NIR of the Cotton Content of Blend Fabrics after Dyeing** – James E. Rodgers, USDA-ARS-SRRC, New Orleans, LA and Keith Beck, North Carolina State Univ., Raleigh, NC

4:30 **Mechanical Analysis Required to Achieve Size-Free Weaving** – Paul S. Sawhney[1], Su-Seng Pang[2], Nozar Sachinvala[1], Timothy A. Calamari[1] and Kumar V. Singh[3], (1)SRRC, ARS, USDA, New Orleans, LA, (2)Louisiana State Univ., Baton Rouge, LA, (3) LSU Mechanical Eng. Dept., Baton Rouge, LA

4:45 **Standardization of Sliding Friction Method Using Cotton Denim** – Uday Godsey, S. Parmeswaran and Seshadri Ramkumar, Texas Tech Univ., Lubbock, TX

5:00 **Adjourn**

Friday, January 7

COTTON UTILIZATION CONFERENCE

Marriott Bacchus

NONWOVENS SYMPOSIUM: FLAMMABILITY

Presiding: John Patrick Jordan, USDA-ARS-SRRC, New Orleans, LA

8:00 **Presider's Comments** – John Patrick Jordan

8:05 **Cotton Flammability** – Vikki Martin, Cotton Inc., Cary, NC

8:30 **Fire Quenching Blankets** – D. V. Parikh, SRRC, New Orleans, LA

8:45 **Novel Flame Resistant Monomers for Nonwovens** – Navzer Sachinvala and SeChin Chang, USDA-ARS-SRRC, New Orleans, LA

9:00 **Developing a Federal Flammability Standard for Mattresses** – Allyson Tenney, US CPSC, Bethesda, MD

9:30 **New and Potential Flammability Regulations for Textiles** – Phil Wakelyn, National Cotton Council, Washington, DC

10:00 **Break**

NONWOVENS SYMPOSIUM

Presiding: Mary Warnock, University of Arkansas, School of Human Environmental Sciences, Fayetteville, AR

10:35 **Cotton Treatment with Cellulase: Its Effect on Properties of Fiber and Nonwoven Fabric** – Svetlana Verenich, E. Shim and B. Pourdeyhimi, Nonwovens Cooperative Research Center, Raleigh, NC

11:00 **Cellulosic Nano-fiber Membranes** – Rohit Uppal and Gita N. Ramaswamy, Kansas State Univ., Manhattan, KS

11:30 **Cotton Flax Blended Nonwoven Fabrics with Value-Added Properties for Industrial Markets** – Patricia A. Annis, Univ. of Georgia, Athens, GA, Dan E. Akin, USDA ARS, Athens, GA, Jonn A. Foulk, USDA ARS CQRS, Clemson, SC and Edward A. Vaughn, School of Materials Science and Engineering, Clemson, SC

12:00 **Lunch**

Presiding: Bob Briggs, Cascades-IFC Disposables, Brownsville, TN

1:00 **Presider's Comments** – Bob Briggs, Cascades-IFC Disposables, Brownsville, TN

1:05 **Calendering & Embossing of Nonwoven Cotton Webs** – D. Steve Gunter, BF Perkins, Sanford, NC

1:30 **Development of Cotton Nonwovens for Advanced Applications: Structural and Mechanical Results** – Seshadri Ramkumar, Senthil Chinnasami and Lohit Shastri, Texas Tech Univ., Lubbock, TX

1:45 **Comfort Studies on Needlepunched Cotton Composites** – Seshadri Ramkumar, Tara Wood, Senthil Chinnasami and Lohit Shastri, Texas Tech Univ., Lubbock, TX

2:00 **In-Plane Water Flow Simulation in Nonwovens Made of Hydrophilic and Non-Hydrophilic Fibers** – Hooman Vahedi Tafreshi, B. Maze and B. Pourdeyhimi, Nonwovens Cooperative Research Center, Raleigh, NC

2:30 **New Developments for Hydroentanglement of Cotton Fibers** – Don Gillespie, Fleissner, Inc., Charlotte, NC

3:00 **Break**

Presiding: Larry Wadsworth, Univ. of Tennessee, Knoxville, TN

3:30 **Presider's Comments** – Larry Wadsworth, Univ. of Tennessee, Knoxville, TN

3:35 **Chemistry of Cellulosic Nonwovens** – Ioan Negulescu, Louisiana State Univ., Baton Rouge, LA

3:50 **Acoustic Properties of Environmentally Benign Automotive Natural Fiber Composites** – April Casandra Antoine[1], D.V. Parikh[1], N.D. Sachinvala[1], Y. Chen[2], L Sun[2] and G. Bhat[3], (1)SRRC-USDA, New Orleans, LA, (2)LSU, School of Human Ecology, Baton Rouge, LA, (3)TANDEC, UTK, Knoxville, TN

4:05 **Cellulose Based Nonwoven Insulation Composites** – Val G. Yachmenev[1], Ioan I. Negulescu[2], Jonathan Y. Chen[2], Tim A. Calamari Jr.[1] and D.V. Parikh[1], (1)Southern Regional Research Center, New Orleans, LA, (2)LSU, Baton Rouge, LA

4:20 **Cellulose Fibers for Automotive Nonwovens** – D.V. Parikh, SRRC-USDA, New Orleans, LA

4:50 **Discussion**

5:00 **Adjourn**

COTTON WEED SCIENCE RESEARCH CONFERENCE

Marriott Grand Ballroom Carondelet

GRADUATE STUDENT COMPETITION CONTINUES

Presiding: Barry J. Brecke, Univ. of Florida, Milton, FL

8:00 **Physiological Behavior of Glyphosate in Roundup Ready Flex Cotton** - Walter Thomas, Whitnee L. Barker, Ian C. Burke and John W. Wilcut, North Carolina State Univ., Raleigh, NC

8:15 **The Use of Residual Herbicides in Conjunction with Early Postemergence Applications of Glyphosate or Glufosinate in Transgenic Weed Control Programs** - Darrin M. Dodds, D. B. Reynolds, J. J. Walton and M. T. Kirkpatrick, Mississippi State Univ., Mississippi State, MS

8:30 **Interference of Liberty®-Link Corn in Liberty®-Link Cotton** - Scott B. Clewis, Wesley Everman, Walter Thomas, Ian Burke, Whitnee Parker and John Wilcut, North Carolina State Univ., Raleigh, NC

8:45 **Physiological Behavior of Liberty® Drift to Non-Target Crops** - Whitnee L. Barker, Walter E. Thomas and John W. Wilcut, North Carolina State Univ., Raleigh, NC

9:00 **Site-specific Plant Growth Regulator Applications Based on Aerial Imagery** - M.T. Kirkpatrick[1], J.J. Walton[1], D.M. Dodds[1], D.B. Reynolds[1], C.G. O'Hara[1] and J.L. Willers[2], (1)Mississippi State Univ., Mississippi State, MS, (2)USDA-ARS, Starkville, MS

9:15 **Weed Management in Roundup Ready Flex and Liberty®-Link Cotton** - Wesley J. Everman[1], Scott B. Clewis[1], Malone Rosemond[2], Jim Collins[2] and John W. Wilcut[1], (1)North Carolina State Univ., Raleigh, NC, (2)Bayer CropScience, Research Triangle Park, NC

9:30 **Weed Control Programs in Roundup Ready Flex Cotton** - Jason J. Walton, Daniel Reynolds, Matt Kirkpatrick and Darrin Dodds, Mississippi State Univ., Mississippi State, MS

9:45 **Interference of Roundup Ready Corn in Roundup Ready Cotton** - Walter Thomas, Ian C. Burke, Scott B. Clewis, Wesley J. Everman, Whitnee L. Barker and John W. Wilcut, North Carolina State Univ., Raleigh, NC

END OF GRADUATE STUDENT COMPETITION

10:00 **Break**

10:30 **Environmental Benefits of Roundup Ready® Cotton** - Angus N Crossan and Ivan R Kennedy, The Univ. of Sydney, Sydney, Australia

10:45 **Weed Control in Conventional and Conservation Tillage Cotton Systems in Arizona** - Kwame O. Adu-Tutu[1], William B. McCloskey[1], Stephen H. Husman[2], Patrick A. Clay[3], Michael J. Ottman[1], Edward C. Martin[1] and Trent Teegerstrom[1], (1)Univ. of Arizona, Tucson, AZ, (2)Univ. of Arizona, Casa Grande, AZ, (3)Univ. of Arizona, Phoenix, AZ

11:00 **Is Twin-Row Cotton Production Feasible?** - Daniel Stephenson IV and Barry Brecke, Univ. of Florida, Milton, FL

11:15 **A Seedling Assay to Identify Aryloxyphenoxy Propionate and Cyclohexanedione Resistance in Iohnsongrass (*Sorghum halepense*)** - Ian C. Burke, Walter E. Thomas and John W. Wilcut, North Carolina State Univ., Raleigh, NC

11:30 **Effect of Planting Date on the Response of Cotton to Envoke** - Griff M. Griffith, Univ. of Arkansas, Fayetteville, AR

11:45 **Sequence: The Foundation for Cotton Weed Control** - E. W. Palmer, G. L. Cloud, J. C. Holloway, D. Porterfield, C. L. Foresman and C. A. Sandoski, Syngenta Crop Protection, Greensboro, NC

12:00 **Lunch**

Presiding: Daniel Stephenson IV, Univ. of Florida, Milton, FL

1:00 **The Effect of Rainfall Timing Following Application of Glyphosate and Glufosinate on the Control of Pitted Morningglory** - Wesley J. Everman and John W. Wilcut, North Carolina State Univ., Raleigh, NC

1:15 **Weed Management in Narrow Row and Conventionally Spaced Liberty®-Link Cotton** - David G. Wilson Jr. and Alan C. York, North Carolina State Univ., Raleigh, NC

1:30 **Weed Management in Liberty®-Link Cotton** - Whitnee L. Barker[1], Wesley J. Everman[1], John Wilcut[1], Jim Collins[2] and Malone Rosemond[2], (1)North Carolina State Univ., Raleigh, NC, (2)Bayer CropScience, Research Triangle Park, NC

1:45 **Palmer Amaranth (*Amaranthus palmeri*) Control** - J. Andrew Kendig, Univ. of Missouri Delta Center, Portageville, MO and Robert L. Nichols, Cotton Incorporated, Cary, NC

2:00 **Co-application and Timing Effects on Glyphosate Efficacy on Selected Weed Species** - D.K. Miller[1], D.M. Scroggs[2], P.R. Vidrine[2], A.M. Stewart[2] and M.S. Mathews[1], (1)LSU AgCenter, St. Joseph, LA, (2)LSU AgCenter, Alexandria, LA

2:15 **Ignite Application Timing and Tank-Mixture Effect on Burndown of Glyphosate Resistant Horseweed in No-Till Cotton** - Larry Steckel, Chism Craig and Robert Hayes, Univ. of Tennessee, West Tennessee Experiment Station, Jackson, TN

2:30 **Glyphosate Resistant Horseweed: A Growing Problem in Arkansas Cotton** - M.B. Kelley[1], K.L. Smith[1], J.R. Meier[1], R.E. Talbert[2], M.R. McClelland[2] and S. Matthews[1], (1)Univ. of Arkansas Southeast Research and Extension Center, Monticello, AR, (2)Univ. of Arkansas Department of Crop, Soil and Environmental Sciences, Fayetteville, AR, (3)Univ. of Arkansas Cooperative Extension Service, Blytheville, AR

2:45 **Gramoxone Tank-Mixtures for Glyphosate-Resistant Horseweed (*Conyza canadensis* L. Cronq.)** - J.C. Holloway, B.D. Black, E.W. Palmer, C.L. Foresman and C.A. Sandoski, Syngenta Crop Protection, Greensboro, NC

3:00 **Break**

3:30 **Liberty®-Link Cotton Trials in Alabama** - Kade Haas[1], Mike Patterson[1] and Wilson Faircloth[2], (1)Auburn Univ., Auburn, AL, (2)USDA-ARS, Dawson, GA

3:45 **Commercial Performance of Ignite Herbicide in Liberty®-Link Cotton in the Southeast and Mid-South** - J.M. Rosemond, Bayer CropScience, Hillsborough, NC, S.B. Garris, Bayer CropScience, Bentonnia, MS, K.W. Vodrazka, Bayer CropScience, Lakeland, TN and H.S Young, Bayer CropScience, Tifton, GA

4.00 **Performance of Ignite Herbicide and the Libery®-Link Cotton System in Univ. Trials across the Southwest** - Russ Perkins, Bayer CropScience, Idalou, TX, Gary Schwarzlose, Bayer CropScience, Spring Branch, TX, Matt Ehlhardt, Bayer CropScience, Chico, CA, Mac Learned, Bayer CropScience, Paso Robles, CA and Manuel Jimenez, Bayer CropScience, Exeter, CA

4:15 **Ignite Weed Control Systems in Liberty®-Link Cotton** - Steven T. Kelly, LSU AgCenter, Winnsboro, LA, Donnie K. Miller, LSU AgCenter, St. Joseph, LA and A.M. Stewart, LSU AgCenter, Alexandria, LA

4:30 **Student Competition Awards**

5:00 **Adjourn**

Friday, January 7

JOINT SESSION: COTTON QUALITY-MEASUREMENTS AND UTILIZATION CONFERENCES

Marriott Balcony I

TEXTILE-QUALITY SYMPOSIUM

Presiding: James E. Rodgers, USDA-ARS-SRRC, New Orleans, LA

1:00 **Fiber Length Utilization Efficiency** - Yehia E. El Mogahzy, Department of Textile Engineering - Auburn Univ., Auburn, AL and Mourad Krifa, International Textile Center - Texas Tech Univ., Lubbock, TX

1:15 **Cotton Fiber Breakage and Its Relation to Length Distribution, Short Fiber and Uniformity** - Kearny Q. Robert, USDA, ARS, SRRC, New Orleans, LA

1:30 **Robust Estimator for Short Fiber Contents of Cotton** - Moon W. Suh, North Carolina State Univ., Raleigh, NC and Michael D. Watson, Cotton Incorporated, Cary, NC

1:45 **Establishing Benchmark Values for SFC Research** - Xiaoliang Leon Cui[1], John B. Price[1], Kearny Q. Robert[1], Devron P. Thibodeaux[1] and Michael D. Watson[2], (1)USDA ARS, SRRC, New Orleans, LA, (2)Cotton Incorporated, Cary, NC

2:00 **Improving IsoTester Short Fiber Content Measurements** - Frederick M. Shofner, Schaffner Technologies, Inc, Knoxville, TN

2:15 **Current Status of Short Fiber Content Measurements on HVI** - C. Roger Riley, Hossein Ghorashi and Michael E. Galyon, Uster Technologies, Inc., Knoxville, TN

2:30 **Method for Determining Broken Fiber Content in Ring-Spun Yarn** - Kearny Q. Robert, Melissa C. Dunn, John B. Price and X. Leon Cui, USDA, ARS, SRRC, New Orleans, LA

2:45 **Quality Evaluation of Cotton Fabrics: Friction Characterization** - R. P. Nachane, Central Institute of Research on Cotton Technology, Mantunga, Mumbai, India, G. F. S. Hussain, Central Institute of Research on Cotton Technology, Matunga, Mumbai, India, Lohit Shastri, Senthil Chinnasami and Seshadri Ramkumar, Texas Tech Univ., Lubbock, TX

3:00 **Break**

JOINT SESSION: COTTON ENGINEERING-SYSTEMS AND GINNING CONFERENCES

Sheraton Grand Ballroom D

Presiding: Thomas D. Valco, USDA, ARS, Stoneville, MS and P.J. Wakelyn, National Cotton Council, Washington, DC

1:30 **Actions to Amend U.S. Fire and Building Codes Applicable to Baled Cotton Storage** - P. J. Wakelyn, National Cotton Council, Washington, DC, Dale Thompson, National Cotton Council, Memphis, TN and Barry Nevius, SE Cotton Ginners Assn., Columbia, SC

1:40 **U.S. EPA Oil Spill Prevention and Response Regulations Affecting Agriculture** - P. J. Wakelyn, National Cotton Council, Washington, DC and Dale Thompson, National Cotton Council, Memphis, TN

1:50 **Bioterrorism and the Cotton Industry** - P. J. Wakelyn[1], Dale Thompson[2], Bill Norman[2] and Gerret Van Duyn[1], (1)National Cotton Council, Washington, DC, (2)National Cotton Council, Memphis, TN

2:00 **Federal Stormwater and Spill Prevention Rules - How Do They Affect Your Gin or Farm?** - J. Kelley Green, Texas Cotton Ginners' Association, Austin, TX, Roger A. Isom, California Cotton Ginners' Association, Fresno, CA, Phillip J. Wakelyn, National Cotton Council of America, Washington, DC and Dennis S. Findley, Southeastern Cotton Ginners Assn., Dawsonville, GA

2:10 **USDA, APHIS Phytosanitary Accreditation Program for Cotton** - Dale Thompson[1], A. G. Jordan[1], T. Martin[1], F. C. Carter[1] and P. J. Wakelyn[2], (1)National Cotton Council, Memphis, TN, (2)National Cotton Council, Washington, DC

2:20 **RFID 101 - What Ginners Should Know About Smart Tags** - Dale Thompson, Tammie Martin and Stephen Slinsky, National Cotton Council, Memphis, TN

2:30 **Device to Replace Multiple Broken Bale Ties** - W. Stanley Anthony, U.S. Cotton Ginning Laboratory, Stoneville, MS

2:45 **Evaluation of Processed Gin Waste for use as a Hydromulch** - Greg A. Holt[1], Mike Buser[1], R. Daren Harmel[2], Ken Potter[2] and Mathew Pelletier[1], (1)USDA-ARS, Lubbock, TX, (2)USDA-ARS, Temple, TX

3:00 **Break**

3:15 **The Benefits of Replacing Used Module Covers** - Shay L. Simpson and Stephen W. Searcy, Texas A&M Univ., College Station, TX

3:30 **Opportunities and Challenges in Bioconversion of Cotton Gin Residues to Ethanol** - Foster Agblevor and Wei Li, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

3:45 **Storage and Characterization of Cotton Gin Waste for Bioethanol Production** - Foster A. Agblevor, J. S. Cundiff, C. Mingle and W. Li, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

4:00 **In the Air Pipe Seed Weight Measuring System** - Mike Gvili, ASCI, Maynard, MA

4:15 **Adjourn**

Thursday & Friday, January 6 – 7

TECHNICAL CONFERENCES
POSTER BOARD SESSION
Preservation Hall, Marriott

Posters will be on display in the meeting rooms for the following:

COTTON ECONOMICS AND MARKETING CONFERENCE
COTTON QUALITY MEASUREMENTS CONFERENCE
COTTON SOIL MANAGEMENT AND PLANT NUTRITION CONFERENCE
COTTON UTILIZATION CONFERENCE

COTTON DISEASE COUNCIL

1. **Results of the 2004 National Cottonseed Treatment Program** - Craig S. Rothrock and Scott Winters, Univ. of Arkansas, Fayetteville, AR
2. **Reniform Nematode Reproduction on Soybean Cultivars in Tests Conducted in 2004** - R. T. Robbins[1], L. Rakes[1], L. E. Jackson[1], E. Shipe[2], P. Chen[1], E. E. Gbur[1] and D. G. Dombek[1], (1)Univ. of Arkansas, Fayetteville, AR, (2)Clemson Univ., Clemson, SC
3. **Tolerance of Selected Transgenic Cotton Cultivars to Columbia Lance Nematode** - S.R. Koenning[1], D. T. Bowman[1] and D. E. Morrison[2], (1)North Carolina State Univ., Raleigh, NC, (2) North Carolina State Univ., Laurinburg, NC
4. **Comparison of Seed and In-Furrow Applied Nematicides for the Control of the Reniform Nematode** - G. L. Sciumbato and J. A. Blessitt, Delta Research and Extension Center, Mississippi State Univ., Stoneville, MS
5. **Microbiology of Cotton Residue Decomposition under Australian Conditions** - V. V. S. R. Gupta, CSIRO Land and Water, Glen Osmond, Australia, Grant N. Roberts, CSIRO Plant Industry, Narrabri, Australia and S. K. Watson, Glen Osmond, Australia
6. **Efficacy of Select Fungicide Seed Treatments With and Without an In-furrow Fungicide** - Patrick D. Colyer and Philip R. Vernon, LSU AgCenter, Bossier City, LA
7. **Messenger®, Harpin Seed Treatment, and HarpinEa Gene Transgenic Cotton Reduce Reproduction by Root Knot and Reniform Nematodes** - Terry L. Kirkpatrick, Univ. of Arkansas, Hope, AR, Ned M. French, Eden Bioscience, Corp., Little Rock, AR, Jim R. Rich, Univ. of Florida, Quincy, FL and Zhongmin Wei, Eden Bioscience, Corp., Bothell, WA
8. **Efficacy of Nine Fungicides for Control of Hardlock** - William W. Bonnette[1], Jonathan K. Croft[1], Michael A. Jones[2] and John D. Mueller[1], (1)Clemson Univ., Blackville, SC, (2)Clemson Univ., Florence, SC
9. **Efficacy of Topsin M for Control of Hardlock** - Jonathan K. Croft[1], William W. Bonnette[1], John D. Mueller[1] and Michael A. Jones[2], (1)Clemson Univ., Blackville, SC, (2)Clemson Univ., Florence, SC
10. **Assessment of the Use of Dicrotophos and Thiophanate Methyl to Manage Hardlock in Georgia** - R. C. Kemerait, Dept. of Plant Pathology, Univ. of Georgia, Tifton, GA, P. M. Roberts, Dept. of Entomology, Tifton, GA, K. W. Seebold, Dept. of Plant Pathology, Univ. of Georgia, Tifton, GA, P. H. Jost, Department of Crop and Soil Sciences, Statesboro, GA, S. N. Brown, Cooperative Extension Service, Moultrie, GA, F. J. Connelly, Cooperative Extension Service, Nashville, GA and J. L. Jacobs, Cooperative Extension Service, Waycross, GA
11. **The Community Structure of Pathogenic Type of *Verticillium dahliae* Kleb. in Cotton Field** - Heqin Zhu, Cotton Research Institute of CAAS, AnYang, China, Guiliang Jian, Plant Protection Research Institute of CAAS, Beijing, China and Xiaoxuan Song, Cotton Research Institute of CAAS, Anyang, China
12. **Evaluation of Tolerance to Alternaria Leaf Spot Disease in Cotton Species** - Fatemeh Azad Disfani and Mohammad Reza Zangi, Gorgan, Iran
13. **Late-Planting Decreased Cotton Root Rot Infestations in Irrigated Fields** - Carlos J. Fernandez, Texas Agricultural Experiment Station, Corpus Christi, TX and Chenghai Yang, Weslaco, TX
14. **Evaluation of Fungicides for the Control of Tight Lock of Cotton in Mississippi** - Kenneth C. Stetina and G. L. Sciumbato, Mississippi State Univ. D.R.E.C., Stoneville, MS

COTTON IMPROVEMENT CONFERENCE

15. **Application of AMMI Model to Analyze Regional Trial Data of Cotton** - Xian-ying Zeng, Cotton and Oil Crops Research Institute of Henan Academy of Agricultural Sciences, Zhengzhou, China
16. **Evaluation of Drought Resistance in Cotton** - Mohammad Reza Zangi, Cotton Research Institute of Iran, Gorgan, Iran
17. **Genotypic-Phenotypic Correlation Between Morphological Characters and Tolerance to Verticillium Wilt Disease in Cotton** - Mohammad Reza Zangi, Abdolghadir Ghajari, Morteza Arabsalmani and Fatemeh Azad Disfani, Cotton Research Institute of Iran, Gorgan, Iran
18. **Evaluation of Regional Cotton Breeders Strains Grown in Root-Knot Infested Soils** - James A. Hayes[1], W. D. Caldwell[1], P. D. Colyer[1] and J. E. Jones[1], (1)Red River Research Station, Bossier City, LA, (2)Jajo Genetics, Baton Rouge, LA
19. **Physiological Response and Genetic Diversity of Tetraploid Cotton to Salt Stress** - Sarah M Higbie, Tracy M Sterling and Jinfa Zhang, New Mexico State Univ., Las Cruces, NM
20. **Interpreting Genotype X Environment Interactions for Yield and Fiber Quality in Cotton Performance Trials Conducted in South Carolina** - B. Todd Campbell, USDA-ARS, Florence, SC and Mike A. Jones, Clemson Univ., Florence, SC
21. **Variation in Marginal Bract Trichomes of Cotton Cultivars** - James M. Hornbeck, Univ. of Arkansas, Marianna, AR and Fred Bourland, Univ. of Arkansas, Keiser, AR
22. **Lint Yield and Fiber Quality as a Function of Soil Moisture** - Carol Mason[1], Jacy Lewis[1], Harriet Bergeron[2], Bay Nguyen[2], Dick L. Auld[2], John Gannaway[1] and Robert J Wright[2], (1)Texas Agricultural Experiment Station, Lubbock, TX, (2)Texas Tech Univ., Lubbock, TX
23. **Large-Plot Replicated Dryland Systems Cultivar Trials in the Texas High Plains** - Mark T. Stelter[1], Kent Lewis[2], Emilio Nino[3], Randy Boman[1] and Mark Kelley[1], (1)Texas Cooperative Extension, Lubbock, TX, (2)Texas Cooperative Extension, Littlefield, TX, (3)Texas Cooperative Extension, Dimmitt, TX
24. **Study on Inheritance of Earliness and its Relative Traits of Short-Season Cotton and QTLs Mapping** - Shuli Fan and Shuxun Yu, The Cotton Research Institute, CAAS, Anyang, China
25. **Resistance Gene Analog (RGA) Markers are Mapped to Homeologous Chromosomes in Cultivated Tetraploid Cotton** - Doug J. Hinchliffe[1], Yingzhi Lu[1], Roy Cantrell[2] and Jinfa Zhang[1], (1) New Mexico State Univ., Department of Agronomy and Horticulture, Las Cruces, NM, (2)Cotton Incorporated, Cary, NC
26. **The Study on the Relation Between Abnormal Plantlets Morphogenesis and Endo-Hormones in Agrobacterium-mediated Transformation in Upland Cotton** - Fuguang Li, Jianfei Qi, Chaojun Zhang, Chuanliang Liu, Lizhao Gene, Yufen Wang, Fenglian Li and Zhixia Wu, Cotton Research Institute, CAAS, Anyang, China
27. **A Molecular Linkage Map and Quantitative Trait Locus Analysis Based on a Recombinant Inbred Line Population of Cotton** - Jinfa Zhang[1], Y Lu[1], R G Percy[2], Mauricio Ulloa[3], Guillermo Becelaere[4], Peng Chee[4] and Roy Cantrell[5], (1)Department of Agronomy and Horticulture, New Mexico State Univ., Las Cruces, NM, (2)USDA-ARS, western Cotton Research Laboratory, Maricopa, AZ, (3)USDA, ARS, Shafter, CA, (4)Univ. of Georgia, Tifton, GA, (5)Cotton Incorporated, Cary, NC
28. **Occurrence of (+)- and (-)-Gossypol in Seed from Wild Species of Gossypium** - Robert Stipanovic, Lorraine Puckhaber, Ed Percival and Alois Bell, Southern Plains Agricultural Research Center, College Station, TX
29. **Cotton Pyramiding Breeding by Molecular Marker Assisted Selection of Fiber Strength** - Youlu Yuan[1], Yuzhen Shi[1], Aiying Liu[1], Wu Wang[1], Junwen Li[1] and Tianzhen Zhang[2], (1)China Cotton Research Institute of CAAS, Anyang, Henan, HI, China, (2)National Key Laboratory of Crop Genetics & Germplasm Enhancement, Cotton Research Institute, Nanjing Agricultural Univ., Nanjing, China
30. **Transposon Mutagenesis For Cotton Functional Genomics** - Kelly Asbill[1], Norma Trolinder[1], Harriet Bergeron[1], Jacy Lewis[1], Thea A Wilkins[2] and Robert J Wright[1], (1)Texas Tech Univ., Lubbock, TX, (2)Univ. of California, Davis, Davis, CA
31. **Discovery of Single Nucleotide Polymorphisms in Selected Fiber Genes in Cultivated Tetraploid Cotton** - Yingzhi Lu[1], J. Curtiss[1], Richard Percy[2], Jinfa Zhang[1] and R G Cantrell[3], (1) New Mexico State Univ., Department of Agronomy and Horticulture, Las Cruces, NM, (2)USDA-ARS, Maricopa, AZ, (3)Cotton Incorporated, Cary, NC
32. **PCR Markers Based on Gene Introns** - Pawan Kumar and Peng W. Chee, Univ. of Georgia, Tifton, GA
33. **How Prevalent is Interspecific Introgression in Upland Cotton?** - Peng Chee[1], Ed Lubbers[1], Lloyd May[1] and Anderw Paterson[2], (1)Univ. of Georgia, Tifton, GA, (2)Univ. of Georgia, Athens, GA
34. **Chromosomal Assignment of BAC-derived SSR Markers in Cotton (*Gossypium hirsutum* L)** - Yufang Guo[1], Sukumar Saha[1], John Yu[2], Johnie N. Jenkins[1], R. J. Kohel[2] and David M Stelly[2], (1)ARS, USDA, Mississippi State, MS, (2) Crop Germplasm Research Unit, College Station, TX

35. **Re-Evaluation of Non-Anthocyanic Traits in *Gossypium hirsutum* and *G. barbadense*** - S. G. Harvey and C. L. Rhyne, Georgia Southwestern State Univ., Americus, GA
36. **Evaluation of the Use of Nitrophenols on Cotton** - Denise A McWilliams, New Mexico State Univ. Cooperative Extension Service, Las Cruces, NM
37. **Seed Quality of Two Cotton Varieties Planted in Ultra Narrow Rows** - Salvador Godoy and Eulalio Delgado, Universidad Autonoma Agraria Antonio Narro, Torreon, Coahuila,, Mexico
38. **Relationships of Historically Important U.S. Upland Cotton Cultivars and Germplasm Lines** - Edward L. Lubbers[1], Peng W. Chee[1], Andrew H. Paterson[2], John R. Gannaway[3] and O. Lloyd May[1], (1)Univ. of Georgia, Tifton, GA, (2)Univ. of Georgia, Athens, GA, (3)Texas Agricultural Experiment Station, Lubbock, TX
39. **Fiber Quality and Gross Returns as Influenced by Blending Two Cotton Varieties** - M.P. Harrison, N.W. Buehring, S.P. Nichols and R.R. Dobbs, Mississippi State Univ., Verona, MS
40. **Effect of Varietal Blends on Fiber Quality and Lint Yield on Upland Cotton in West Texas** - Aaron S Alexander, Efrem Bechere and Dick L. Auld, Texas Tech Univ., Lubbock, TX
41. **Genetic Improvement of New Mexico Acala Cotton Germplasm and Their Genetic Divergence** - Jinfa Zhang[1], Y Lu[1], H Adragna[1], E Hughs[2] and R G Cantrell[3], (1)Department of Agronomy and Horticulture, New Mexico State Univ., Las Cruces, NM, (2)Southwest Cotton Ginning Lab, Mesilla Park, NM, (3)Cotton Incorporated, Cary, NC
42. **Notice of Release of RN96425, RN96527 and RN96625-1 Germplasm Lines of Cotton** - C. G. Cook[1], A. F. Robinson[2], A. C. Bridges[2] and J. A. Bautista[1], (1)Syngenta Seeds, Inc., Victoria, TX, (2)USDA-ARS, College Station, TX
43. **Cotton Variety Test Results for Louisiana, 2004** - James A. Hayes[1], W. D. Caldwell, D. J. Boquet, E. Clawson, A. M. Stewart and J. I. Dickson, Red River Research Station, Bossier City, LA 71113
44. **Cotton Varieties Planted in Arkansas, 1995-2004** - Brandon Brown and Fred Bourland, Univ. of Arkansas, Keiser, AR
45. **The Crops Genetic Research Facility at The Texas A&M Research and Extension Center at Lubbock, TX, Screens Wild Cotton Germplasm for Resistant Traits** - M. D. Arnold, A. J. Hall, J. L. Mabry, M. A. Sheehan, J. R. Gannaway, T. A. Wheeler and L. W. Wells, Texas Agricultural Experiment Station, Lubbock, TX
46. **Report of the Crop Germplasm Committee** - Ted P Wallace, Mississippi State Univ., Mississippi State, MS, Richard Percy, USDA-ARS, Maricopa, AZ, Osman A. Gutierrez, USDA-ARS, Mississippi State, MS, Peggy Thaxton, Texas A&M Univ., College Station, TX and Mauricio Ulloa, USDA-ARS, Shafter, CA

COTTON INSECT RESEARCH AND CONTROL CONFERENCE

47. **Efficacy of VipCot™ for Control of the Bollworm/Tobacco Budworm Complex in Northwest Louisiana** - Bill Waltman, Colleen Cookson and Stephen Mickinski, Red River Research Station, Bossier City, LA
48. **Pink Bollworm and Other Cotton Insect Mortalities in Bollgard® and Roundup Ready Cottons** - Lynn Forlow Jech and Thomas Henneberry, USDA-ARS-WCRL, Phoenix, AZ
49. **Effect of Avidin on the Growth and Mortality of Five Lepidopteran Insects** - Yu Cheng Zhu, John Adamczyk and Sandy West, USDA-ARS, Stoneville, MS
50. **Interaction of Bt and Proteinase Inhibitors on the Growth and Development of the Cotton Bollworm, Helicoverpa zea** - Yu Cheng Zhu and Sandy West, USDA-ARS, Stoneville, MS
51. **Bollworm/Budworm Management in Virginia: Species Ration, Parathyroid Resistance Levels, and Efficacy of Foliar and Plant Delivered Insecticides** - Greg Payne[1], D. Ames Herbert[2] and Sean Malone[2], (1)State Univ. of West Georgia, Carrollton, GA, (2)Virginia Tech, Suffolk, VA
52. **Nine Years of Transgenic Cotton in México, Adoption and Resistance Management Results** - Jose L. Martinez-Carrillo, INIFAP, Ciudad Obregon, Sonora, Mexico and Nicolas Diaz-Lopez, Monsanto, Mexico. D. E, ME, Mexico
53. **Laboratory Evaluation of Selected Insecticides on Field-Collected Populations of Bollworm and Tobacco Budworm Larvae-2004** - Samuel Polizzi and Gregory Payne, State Univ. of West Georgia, Carrollton, GA
54. **Susceptibility of Bollworm (*Helicoverpa zea*) Adults From Across the Mid-Atlantic States to Pyrethroid Insecticides** - Greg Payne, State Univ. of West Georgia, Carrollton, GA, Galen Dively, Univ. of Maryland, College Park, MD, Shelby Fleischer, Pennsylvania State Univ., Univ. Park, PA, Ames Herbert, Virginia Tech, Suffolk, VA, Joseph Ingerson-Mahar, Rutgers Univ., New Brunswick, NJ, Thomas Kuhar, Virginia Tech, Painter, VA and Joanne Whalen, Univ. of Delaware, Newark, DE
55. **Survey of Acetylcholinesterase Activities in Field-Collected Tobacco budworm and Bollworm Populations from Georgia-2004** - Samuel Polizzi and Gregory Payne, State Univ. of West Georgia, Carrollton, GA
56. **Assessing the Utility of Stable Carbon Isotopes for Determining Natal Host Origins of Tobacco Budworm, Heliothis virescens, in a Host Species Rich Agro-ecosystem** - Mark R. Abney, Clyde E. Sorenson, Fred Gould and Julius R. Bradley Jr., NC State Univ., Raleigh, NC
57. **Results of Field Experiments with Transgenic Cotton Varieties (VIPCOT and Widestrike) in the Texas Coastal Bend** - Roy D Parker and Stephen D. Livingston, Texas Cooperative Extension, Corpus Christi, TX
58. **Chaperone Effects on Bollworm Survival and Cry1Ac Levels in Bt Cotton Flowers and Squares** - Charles F. Chilcutt, Texas A&M Univ. Agricultural Res. & Ext. Center, Corpus Christi, TX
59. **Yield Partitioning and Compensation for Bollworm Losses in New Mexico** - Jane Breen Pierce and Patricia Yates Monk, , New Mexico State Univ., Artesia, NM
60. **Gossypium Thurberi as a Pink Bollworm (PBW), Pectinophora Gossypiella (Saunders), Reproductive Host** - Thomas J. Henneberry and L. Forlow Jech, USDA-ARS, Phoenix, AZ
61. **Bt Cotton Adoption and Performance in Missouri** - Michael L. Boyd, Univ. of Missouri-Delta Center, Portageville, MO
62. **Interactions of Water Deficit Stress and Tarnished Plant Bug Induced Injury in Midsouth Cotton** - Tina Gray Teague[1], Steven Coy[1] and Diana M. Danforth[2], (1)Univ. of Arkansas Agricultural Experiment Station - Arkansas State Univ., State Univ., AR, (2)Department of Agricultural Economics and Ag Business, Univ. of Arkansas, Fayetteville, AR
63. **Aerial Application of Acephate Against Tarnished Plant Bugs at One, Three and Five GPA** - J. P. Lee, J. H. Temple, J. Sharp, T. Price, B. R. Leonard and R. D. Bagwell, LSU Agcenter, Winnsboro, LA
64. **Cotton Boll Susceptibility to Male, Female and Late Instars of Southern Green Stink Bugs** - P. L. Bommireddy[1], B.R. Leonard[2], J. Temple[1] and R. Gable[2], (1)LSU Agricultural Center, Baton Rouge, LA, (2)LSU Agricultural Center, Winnsboro, LA
65. **Tarnished Plant Bug Response to Crop Vigor and Detection of Vigor Differences Via Remote Sensing** - F. A. Harris[1], P. J. English[1], D. L. Sudbrink, Jr.[1], G. D. Wills[1] and J. E. Hanks[2], (1)Mississippi State Univ., Stoneville, MS, (2)USDA, ARS, Stoneville, MS
66. **Impacts of a Plant-feeding Bug Complex on Cotton Cultured Under Protected and Unprotected Environments in North Carolina** - John W. Van Duyn[1], Eric L. Blinka[2] and J. R. Bradley[2], (1)North Carolina State Univ., Plymouth, NC, (2)North Carolina State Univ., Raleigh, NC
67. **Late Season Tarnished Plant Bug Control with Diamond (novaluron)** - Charles Guy, Tillar, AR and Alan Dalrymple, Crompton Corp., Brenham, TX
68. **Spatial and Temporal Occurrence of Brown Stinkbug (*Euschistus servus*) in Eastern North Carolina Agroecosystems** - Eric L Blinka[1], J.R. Bradley[1] and John VanDuyn[2], (1)North Carolina State Univ., Raleigh, NC, (2)North Carolina State Univ., Plymouth, NC
69. **Bionomics of Anaphes pectoralis: An Egg Parasitoid of Lygus spp** - Randy J Coleman and Walker A. Jones, USDA, ARS, BIRU, Weslaco, TX
70. **Management of Tarnished Plant Bug With Insecticides in Northeast Arkansas** - Glenn E. Studebaker, G. Lorenz and J. Greene, Univ. of Arkansas, Keiser, AR
71. **Management Considerations for Stink Bugs - 2004** - Jeremy Greene[1], Chuck Capps[1], Gus Lorenz[2], Glenn Studebaker[3], John Smith[4] and Randy Luttrell[4], (1)Univ. of Arkansas, Monticello, AR, (2)Univ. of Arkansas, Little Rock, AR, (3)Univ. of Arkansas, Keiser, AR, (4)Univ. of Arkansas, Fayetteville, AR
72. **Efficacy of Selected Insecticides for Control of Tarnished Plant Bug, *Lygus lineolaris*, in Southeast Arkansas - 2004** - Jeremy Greene[1], Chuck Capps[1], Glenn Studebaker[2], Gus Lorenz[3] and Kyle Caldwell[3], (1)Univ. of Arkansas, Monticello, AR, (2)Univ. of Arkansas, Keiser, AR, (3)Univ. of Arkansas, Little Rock, AR
73. **Occurrence of Tarnished Plant Bug Populations with Two Intensities of Diapause in the Mississippi River Delta** - Gordon Snodgrass, USDA, ARS, Stoneville, MS
74. **Occurrence of the Cotton Fleahopper in a Previously Unreported Early-season Host in Central Texas** - Jesus Esquivel, U. S. Department of Agriculture ,College Station, TX
75. **Evaluation in the Laboratory of Novaluron to Control Southern Green Stink Bug** - Juan D. Lopez and Mohamed A. Latheef, USDA-ARS, College Station, TX
76. **An Expanded Evaluation of Insecticidal Toxicity to Cotton Fleahoppers** - Juan. D. Lopez and Mohamed A. Latheef, USDA-ARS, College Station, TX
77. **Crop Response to Tarnished Plant Bug Induced Injury in Mid and Late Season Cotton in NE Arkansas** - Tina Gray Teague[1], Diana M. Danforth[2] and Steven Coy[1], (1)Univ. of Arkansas Agricultual Experiment Station - Arkansas State Univ., State Univ., AR, (2)Department of Agricultural Economics and Ag Business, Univ. of Arkanas, Fayetteville, AR
78. **Lygus Survey in the Texas High Plains: Species Composition and Host-Plant Sequencing** - Stanley C. Carroll, Megha N. Parajulee and Mark D. Arnold, Texas Agricultural Experiment Station, Lubbock, TX
79. **When is a Cotton Boll Safe from *Lygus hesperus* Damage?** - Andy M. Cranmer[1], Megha N. Parajulee[2], James F. Leser[3], Mark D. Arnold[2] and Stanley C. Carroll[2], (1)Texas Cooperative Extension, Seminole, TX, (2)Texas Agricultural Experiment Station, Lubbock, TX, (3)Texas Cooperative Extension, Lubbock, TX

80. **Early-Season Dispersal of Cotton Fleahoppers (Pseudatomoscelis seriatus)** - John K. Westbrook, Jesus F. Esquivel and Ritchie S. Eyster, U.S. Department of Agriculture, College Station, TX

81. **Efficacy of Selected Insecticides for Control of Tarnished Plant Bug in Arkansas, 2004** - G. M. Lorenz[1], Kyle Colwell[1], Jeremy Greene[2], Chuck Capps[2] and J. Hardke[1]. (1)Univ. of Arkansas, Little Rock, AR, (2) Univ. of Arkansas, Monticello, AR

82. **Cotton Fleahopper: Screening for Host Plant Resistance in Cotton** - Allen Knutson, Texas A&M Research and Extension Center, Dallas, TX

83. **Times Between Boll Weevil Oviposition, Square Abscission and Development to Adulthood Under Field Conditions** - Allan T. Showler and Raul V. Cantu, USDA-ARS, Weslaco, TX

84. **Resumption of Boll Weevil Pheromone Production** - Charles P.-C. Suh, Derrick L. Hall and Dale W. Spurgeon, USDA-ARS, APMRU, College Station, TX

85. **Update on the "Attract & Control" Technology in Boll Weevil Prevention, Suppression & Eradication Programs in Latin America during Crop Cycles 2003/2004 & 2004/2005** - T. A. Plato, J. E. Gonzalez, A. Ingolotti, O. G. Manessi, M. Margulis, S. E. Plato and R. Sanz S., Plato Industries Ltd., Houston, TX

86. **Screening of Four Lignin Additives as Uv Protectants to Baculovirus** - Ahmed Abdu Hamed Amin[1], Magda Mohamed Khattab[1], Salah Elnagar[2], Mohamed Abd Elkhader El-Sshik[1] and Said El-Salamony[1], (1)Plant Protection Res. Institute, Dokki, Egypt, (2)Cairo Univ., Giza, Egypt

87. **Combolures - Improved Pheromone and Insecticide Delivery Systems for Use in Active and Post Eradication Programs** - Timothy Johnson[1], Ken Pierce[2], Mark Muegge[3], Scott Plato[4], Tom Plato[4] and Ralph Bagwell[5], (1)Plato Industries, Langhorne, PA, (2)USDA, APHIS, Texarkana, TX, (3)Texas Cooperative Extension Service, Fort Stockton, TX, (4)Plato Industries, Ltd., Houston, TX, (5)LSU Agcenter, Winnsboro, LA

88. **Field Evaluation of Different Boll Weevil Trap Models for Use in Active and Post Eradication Programs** - Timothy Johnson[1], Scott Plato[2], Tom Plato[2], Ralph Bagwell[3] and Ken Pierce[4], (1)Plato Industries, Langhorne, PA, (2)Plato Industries, Ltd., Houston, TX, (3)LSU Agcenter, Winnsboro, LA, (4) USDA, APHIS, Texarkana, TX

89. **Cotton Fruit Size or Age on Boll Weevil Fecundity and Oviposition** - Allan T. Showler, USDA-ARS, Weslaco, TX

90. **Stink Bug Population Dynamics in South Georgia Crop Systems** - Russel J. Ottens, J. David Griffin and John R. Ruberson, Univ. of Georgia, Tifton, GA

91. **Biocontrol and Conventional Insecticide Programs for Cotton Key Pests in Egypt and Their Side Effects on Natural Enemies** - Malak Farah Girgis, Mortda Ahmed Essa and Alia Abd El-Hafez, Plant Protection Research Institute, Cairo, Egypt

92. **Control Options for Thrips in Southeast Arkansas - 2004** - Chuck Capps[1], Jeremy Greene[1], Glenn Studebaker[2] and Gus Lorenz[3], (1)Univ. of Arkansas, Monticello, AR, (2)Univ. of Arkansas, Keiser, AR, (3)Univ. of Arkansas, Little Rock, AR

93. **Cotton Aphid Treatment Decisions Based on Predaceous Coccinellids** - Adam Siitonen Chappell, Univ. of Arkansas, Fayetteville, AR

94. **Comparison of Experimental and Registered Acaricides for Management of Spider Mites in California Cotton** - Kevin E. Keillor, Shafter, CA and Larry D. Godfrey, Univ. of California, Davis, Davis, CA

95. **The Impact of Different Tillage Practices on Arthropods in Cotton in the Southern Rolling Plains of Texas** - C.G. Sansone, Texas Cooperative Extension, San Angelo, TX and R.R. Minzenmayer, Texas Cooperative Extension, Ballinger, TX

96. **Investigation of the Mode of Action of a Non-Equilibrium Discharge on Arthropod Pests** - Kevin V. Donohue, Brian L. Bures, Mohamed A. Bourham and R. Michael Roe, North Carolina State Univ., Raleigh, NC

97. **Biochemical Mechanisms of Organophosphorus Insecticide Resistance in the Cotton Leafworm *Spodoptera littoralis*** - Sanaa Abdelhamid Ibrahim, Minia Univ., Minia, Egypt

98. **Interactive Effects of Field Variability, Crop Response and Equipment Resolution on Errors in Site-Specific Insecticide Applications** - Patrick J. English[1], Sherri L. DeFauw[1], F. Aubrey Harris[1] and Boise D. Stokes[1], (1)Mississippi State Univ., Stoneville, MS, (2)Univ. of Arkansas, Fayetteville, AR

99. **Control of Pectinophora gossypiella (Saund.) and Earias insulana (Boisd.) in Cotton Fields by Releasing Trichogramma evanescens Westwood** - Alia Abd El-Hafez, Watson M. Watson, Mortada Ahmed Essa and Khalil GH. El-Malki, Plant Protection Research institute, Cairo, Egypt

100. **Molecular Characterization of Epoxide Hydrolase cDNAs from the Cabbage Looper, Trichoplusia ni** - R. Michael Roe, Deborah Thompson and Douglas D. Anspaugh, North Carolina State Univ., Raleigh, NC

101. **Precision Cotton Production in New Mexico's Mesilla Valley** - Joe Ellington, Jeff Drake and Tracey Carrillo, New Mexico State Univ., Las Cruces, NM

COTTON PHYSIOLOGY CONFERENCE

**Denotes Graduate Student Competition Entry

102. **Effects of Exogenous Application of GA3 on Fiber Morphology and Secondary Wall Synthesis** - Robert Seagull and Pauline Gould, Hofstra Univ., Hempstead, NY

103. **Examining the Role of Rubisco activase Regulation in Cotton Plant Photosynthesis in Response to Temperature Stress** - Benjamin P. DeRidder and Steven J. Crafts-Brandner, USDA-ARS WCRL, Phoenix, AZ

104. **Using the Cellulose Binding Domain of Cellulase Labeled with a Fluorescent Tag to Monitor Cellulose Biosynthesis in Cotton Fiber** - Sunran Kim and Barbara A. Triplett, USDA-ARS, Southern Regional Research Center, New Orleans, LA

105. **Optimal Growth and Secondary Metabolite Production in Cotton Hairy Roots** - Michael K. Dowd[1], Stephanie C. Moss[2], Scott M. Pelitire[1] and Barbara A. Triplett[1], (1)USDA-ARS, New Orleans, LA, (2)Univ. of New Orleans, New Orleans, LA

106. **Genotypic Root Response of Cotton at Sub-optimal Temperature Enviornments**** - Nathan B Mills and Derrick M. Oosterhuis, Univ. of Arkansas, Fayetteville, AR

107. **Strategies for Chaperone and Pentia Use on Cotton**** - Thomas A. Gola II[1], J. Tom Cothren[2] and Josh Bynum[2], (1)Texas A&M, College Station, TX, (2)Texas Agricultural Experiment Station, College Station, TX

108. **Nitrophenolate-Based Chaperone® Alleviated Yield-Detrimental Effects of Cotton Root Rot** - J. Carlos Correa and Carlos J. Fernandez, Texas Agricultural Experiment Station, Corpus Christi, TX

109. **Enhanced Physiological Functioning and Increased Protein Levels with Chaperone Under High Temperature Stress** - Derrick M Oosterhuis and Robert S Brown, Univ. of Arkansas, Fayetteville, AR

110. **Nitrophenolate-Based Chaperone® Increased Petiole-Nitrate Content in Rain-Fed Cotton** - J. Carlos Correa and Carlos J. Fernandez, Texas Agricultural Experiment Station, Corpus Christi, TX

111. **A Four Year Study of Chaperone in the Mississippi Delta** - Joe Townsend, Townsend Ag Consulting Inc., Coahoma, MS

112. **A Four Year Beltwide Review Covering the Effects of Chaperone on Yield Components** - James Lackey, LTA Research Management, Taft, TX

113. **Yield Effects on Cotton Treated with Chaperone in the Tri-State Delta** - Bentley Curry, Rayville, LA, Clyde Sartor, Vicksburg, MS and Charles Denver, Watson, AR

114. **Southwest Cotton Production- Benefits derived from Chaperone** - James L. Taylor, Bryan, TX, James Powell, Lubbock, TX and Paul Pilsner, Wharton, TX

115. **A Three Year Study of Mississippi Hill Cotton Treated with Chaperone** - Jeff North, Brandon, MS

116. **Yield Response of Irrigated Cotton to Chaperone® Alone and in Combination with a Foliar Fertilizer** - Carlos J. Fernandez and J. Carlos Correa, Texas Agricultural Experiment Station, Corpus Christi, TX

117. **Comparison of the Adjuvants, Ethephon 6®, Dropp SC®, Finish® and MFX-0307® Applied with Def 6® Cotton Defoliant** - Elizabeth J. Jones[1], James E. Hanks[2], Gene D. Wills[1], Bobby W. Alford[3] and Robert E. Mack[3], (1)Delta Research and Extension Center, Stoneville, MS, (2)USDA-ARS, Stoneville, MS, (3)Helena Chemical Company, Memphis, TN

118. **Effects of Late-Season Foliar Applied Phosphate Upon Boll Weight, Seed Counts and Crop Maturation** - Gary Shafer, Phoenix Technologies, Lawrence, KS

119. **Influence of Adjuvants on Harvest Aid Performance** - David J. Pigg[1], Dan D. Fromme[1], Gary Schwarzlose[2] and Robert G. Lemon[3], (1)Texas Agricultural Experiment Station, Wharton, TX, (2)Bayer CropScience, Spring Branch, TX, (3)Texas A&M Univ., College Station, TX

120. **Effects From the Addition of a pH Buffer Upon Boll Conditioning and Defoliation** - Gary Shafer, Phoenix Technologies, Lawrence, KS

121. **Effects of Foliar Fungicides on Hardlock and Yield of Deltapine 555 and Paymaster 1218**** - Jonathan K. Croft[1], Michael A. Jones[2] and John D. Mueller[1], (1)Clemson Univ., Blackville, SC, (2)Clemson Univ., Florence, SC

122. **Effect of Antifungal Peptides on Mycorrhizal Associations**** - Anna C. Nader and James McD. Stewart, Univ. of Arkansas, Fayetteville, AR

123. **Irrigated Cropping Systems to Conserve Natural Resources and Enhance Economic Returns in the Texas Rolling Plains** - John Sij[1], Jason Ott[1], Brian Olson[2], Todd Baughman[1] and David Bordovsky[1], (1)Texas A & M Univ., Vernon, TX, (2)Kansas State Univ., Colby, KS

124. **A Comparative Agronomic Analysis of Subsurface Drip Irrigation and Overhead Irrigation in Cotton Grown in Georgia**** - Glen Ritchie, Cory Mills, Craig W. Bednarz and Jared Whitaker, Univ. of Georgia, Tifton, GA

125. **Fruiting and Yield Responses in Cotton to Insecticidal Treatment**** - Brett M. Niccum, J. T. Cothren and Josh Bynum, Texas A&M, College Station, TX

126. **Evaluation of PGR Properties of Trimax in Cotton**** - Cy C. McGuire, J. Tom Cothren and Josh B. Bynum, Texas A&M Univ., College Station, TX

127. **Variety Response to Mepiquat Chloride Applications** - Chism Craig and C. Owen Gwathmey, Univ. of Tennessee, Jackson, TN

128. **Effect of the Plant Growth Regulator PGR IV Plus as a Safener for Glyphosate Applications in Cotton** - Derrick M Oosterhuis, Evangelos Gonias and Robert S Brown, Univ. of Arkansas, Fayetteville, AR

129. **Evaluation of Mepiquat Chloride Treatments at Cutout or the Latest Possible Cutout Date** - Bill Robertson, Frank Groves and Matt Cordell, UACES, Little Rock, AR

130. **Yield, Quality and Fruit Distribution in BGII/RR Flex and BG/RR Cottons When Exposed to Excessive Glyphosate Applications, Mismanaged Lepidopteran Pests and Water Deficit Stress**** - Glen Ritchie, Jared Whitaker, Craig W. Bednarz and Cory Mills, Univ. of Georgia, Tifton, GA

131. **Lint Quality and Yield Characteristics of Normal and Misshapen Bolls Due to Ineffective Pollination**** - Guy David Collins, N.C. State Univ., Raleigh, NC

132. **Rainfastness of WP and SC Formulations of Dropp**** - Josh Bynum and J. Tom Cothren, Texas Agricultural Experiment Station, College Station, TX

133. **Precision Agriculture Technologies for Cotton Production** - J.E. Hanks[1], G.D. Wills[2], F.A. Harris[2], E.A. Jones[2] and D.K. Fisher[1], (1)USDA-ARS, Stoneville, MS, (2)Delta Research and Extension Center, Stoneville, MS

134. **Comparison of Broadcast and Image-based, Variable Rate Application of Mepiquat Chloride on Crop Growth and Fruit Retention Using the COTMAN Crop Monitoring System** - Steven Coy[1], Tina Gray Teague[1], David Wildy[2], Larry Hendrickson[3], Nick Seidl[3], Jeff Keiser[3], Morteza Mazaffari[4] and Diana M. Danforth[5], (1)Univ. of Arkansas Agricultural Experiment Station - Arkansas State Univ., State Univ., AR, (2)Wildy Farms, Manila, AR, (3)John Deere, Urbandale, IA, (4) Univ. of Arkansas Soil Testing and Research Laboratory Marianna, AR, (5)Department of Agricultural Economics and Ag Business, Univ. of Arkansas, Fayetteville, AR

135. **Demonstration of Spatially Variable Plant Growth Regulators and Defoliants** - B.R. Leonard[1], J. Temple[1], Kenneth W. Paxton[1], R. Downer[2], Ralph Bagwell[4] and Randy Price[2], (1)LSU Agricultural Center, Winnsboro, LA, (2)LSU Agricultural Center, Baton Rouge, LA, (3) Louisiana State Univ., Baton Rouge, LA, (4)Louisiana State Univ., Winnsboro, LA

136. **Cotton Varieties, Lint Yield and Fiber Quality Response to Seeding Rates** - R.R. Dobbs[1], N.W. Buehring[1], S.P. Nichols[1] and M.P. Harrison[1], (1)Mississippi State Univ., Verona, MS, (2)Mississippi State Univ., Stoneville, MS

137. **Determining the Potassium Requirements for Modern Cotton Cultivars** - Michael A. Jones and James C. Camberato, Clemson Univ., Florence, SC

138. **Uniform Stacked-Gene Cotton Variety Trials in the Upper Gulf Coast and Central Texas** - Dan D. Fromme[1], Robert G. Lemon[2], David J. Pigg[1], Glenn Avriett1, Dale Rankin1, Vince Saladino[2] and Al Nelson[2], (1) Texas Agricultural Experiment Station, Wharton, TX, (2)Texas A&M Univ., College Station, TX

139. **Planting Date and Variety Effects on Cotton Yield and Maturity** - Ernest L. Clawson[1], Donald J. Boquet[1], Alphonse B. Coco[1] and E. Yvonne Westbrook[1], (1)LSU AgCenter, St. Joseph, LA, (2)LSU Agricultural Center, Winnsboro, LA

140. **Comparison of Sampling Methods for Lint Percent and Fiber Quality in the Louisiana Official Cotton Variety Trials** - Ernest L. Clawson[1], W. D. Caldwell[2], James Hayes[1], Alphonse B. Coco[1] and E. Yvonne Westbrook[1], (1)LSU AgCenter, St. Joseph, LA, (2)LSU, Bossier City, LA

141. **Cotton Yield Responses to Narrow-Row and Conventional Row Spacing** - Carlos J. Fernandez, Texas Agricultural Experiment Station, Corpus Christi, TX and Jeff Stapper, Texas Cooperative Extension, Sinton, TX

COTTON WEED SCIENCE RESEARCH CONFERENCE

142. **A Comparison of Roundup Ready and Roundup Ready Flex Cotton Systems** - Tome Martin Duvall[1], Ron N Vargas[1], Steve D. Wright[2], Lalo Banuelos[2] and Eric Hoffman[1], (1)Univ. of California Cooperative Extension, Madera, CA, (2)Univ. of California Cooperative Extension, Tulare, CA

143. **Cotton Tolerance to VALOR® (Flumioxazin) Herbicide Using Different Tillage/Planting Methods and Different Preplant Application Timings** - Billy R. Corbin[1], John Pawlak[2], Charles Henderson[1], Jimmy Etheridge[1] and Ronnie Jones[3], (1)Valent USA Corporation, Greenville, MS, (2)Valent USA Corporation, Lansing, MI, (3)Valent USA Corporation, Gainesville, FL

144. **Prowl 3.3 EC Spray and Fertilizer Impregnation Studies in Strip-Tillage Cotton** - A. Stanley Culpepper and Timothy L. Grey, Univ. of Georgia, Tifton, GA

145. **Effect of Cutleaf Eveningprimrose Density on Seed Cotton Yield in Strip-Tillage Cotton** - Michael G. Burton and Alan C. York, NC State Univ., Raleigh, NC

146. **Rye Biomass Amount Affects Weed Suppression Levels in Conservation-tillage Cotton** - Andrew J. Price, Kipling S. Balkcom and Francisco J. Arriaga, USDA-ARS, Auburn, AL

147. **Effects of Tank Mixes with Roundup and Insecticides** - Jarrod T. Hardke[1], Gus M. Lorenz[1], Adam Chappell[2] and Craig Shelton[3], (1)Univ. of Arkansas CES, Little Rock, AR, (2)Univ. of Arkansas CES, Fayetteville, AR, (3)Univ. of Arkansas CES, Jonesboro, AR

148. **Nutsedge Control in Cotton with Trifloxysulfuron Programs** - M.S. Mathews and D.K. Miller, LSU AgCenter, St. Joseph, LA

149. **Ignite and Liberty®-Link Cotton Evaluations for the California Production System** - Ron N Vargas[1], Steve D. Wright[2], Tome Martin Duvall[1] and Lalo Banuelos[2], (1)Univ. of California Cooperative Extension, Madera, CA, (2)Univ. of California Cooperative Extension, Tulare, CA

150. **Timing Ignite Applications in a Liberty®-Link Cotton System** - Joel L. Faircloth, Virginia Tech, Suffolk, VA and Alan C. York, North Carolina State Univ., Raleigh, NC

151. **Resource (flumiclorac-pentyl) a New Tool for Cotton Harvest Aid** - C. Henderson[1], B. Corbin[1], J. Etheridge[1] and J. Pawlak[2], (1)Valent USA Corporation, Greenville, MS, (2)Valent USA Corporation, Lansing, MI

152. **Using Envoke and Suprend with Touchdown for Cotton Weed Control in the Southwest** - W. James Grichar, Texas Agricultural Experiment Station, Yoakum, TX and Brad W. Minton, Syngenta Crop Protection, Cypress, TX

153. **Weed Managment with Liberty®-Link, Roundup-Ready and Non-transgenic Cotton Systems** - Scott B. Clewis[1], Ian Burke[1], John Wilcut[1], Jim Collins[2] and Malone Rosemond[2], (1)North Carolina State Univ., Raleigh, NC, (2)Bayer CropScience, Research Triangle Park, NC

154. **When Crops Become Weeds: Determining Critical Interference Period for Roundup Ready® Cotton or Soybean** - D. R. Lee, D.K. Miller and M. Mathews, LSU AgCenter, Lake Providence, LA

156. **When Crops Become Weeds: Effects of Full Season Interference from Roundup Ready® Cotton or Soybean** - Donna R. Lee, D. K. Miller and M. Mathews, LSU AgCenter, Lake Providence, LA

Annexe 2

Articles et diapositives des 3 présentations à la conférence « *quality measurement* »

CATI: Application of Image Analysis Systems For Seed Coat Fragment Detection And for Other Fibre Characterization

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(2) CSIR, Port Elizabeth, South Africa
(3) ENSITM, Mulhouse, France

Abstract

Research conducted by Cirad in the 1990s focussed on reducing the number of seed coat fragments (SCF) in cotton lint. Technologies were therefore developed to characterize cotton samples and the TRASHCAM project was initiated to develop a sample preparation technique and the software for counting and sizing SCF in cotton webs. Various CATI software systems were produced to analyse images captured on a grey scale (256 grey levels). This technology was then showed to be effective for SCF in breeding programmes, but was dependent upon the preparation technique which involved using a mini-card that is assumed to remove everything in the lint but SCF.

Other preparation devices were tested, but impurities remained in the cotton web together with the SCF. To overcome this problem, software was developed that took into account the colour of the foreign matter in the lint.

This software, called CATI, proved to be effective and thanks to its versatility was considered as potentially of interest for determining the number of dark or stained wool fibres in wool webs.
Results obtained with this software in the measurement of dark and stained fibres in wool webs are presented in this paper.

Introduction: Seed-coat fragments, an impurity that can lead to quality and productivity problems

Seed-coat fragments (SCF) are created during ginning when the fibres are separated from the seeds (). Some weak parts of the seed-coat, e.g. the chalaza, are separated or broken. SCF often carry fibres or linters, and this makes them difficult to remove during the spinning process. These fragments end up in the yarn and in the fabric where they constitute a major source of defects (Krifa, 2002). In short, the SCF originate in the field (variety, environmental and growing conditions, Bachelier 1998), are revealed during ginning and remain in the fibres through out downstream processing steps.

This contamination has economic repercussions: 1/ during ginning, where more intense cleaning operations are required, with the risk of reducing fibre technological characteristics; 2/ during spinning, by reducing yarn yield and quality; 3/ during fabric processing, by increasing costs.

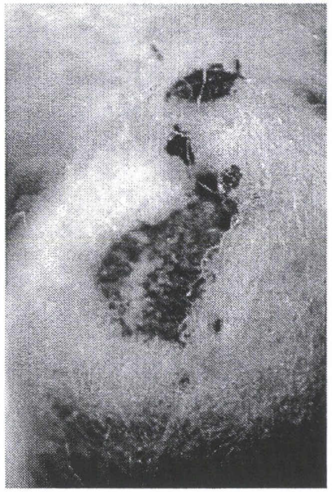

Figure 1: Chalaza torn off the seed (credit B. Bachelier).

TRASHCAM: a tool to count and size seed coat fragments

The TRASHCAM project led to the development of a rapid method used to evaluate the seed coat fragment (SCF) potential of new cotton cultivars. A camera is used to acquire an image of the fibre web and this is then analysed by image processing (Gourlot, 1995, 1997). CATI (Counting Apparatus of some Types of Impurities), the latest versions of the product, have improved image quality by using a scanner for image acquisition (Giner, 1998).

TRASHCAM is a test device that avoids the requirement to manufacture yarn then analyse this yarn on an evenness tester for trash particles (Frydrych 1989). The TRASHCAM also analyses an image of the card web prepared in the following manner: about 10 grams of cotton are mixed on a laboratory opener. The fibre web is rolled around a cylinder on leaving the opener. This web is cut into four parts which are placed one on top of the other on entering a laboratory mini-card (Shirley Platt). Four layers of fibre web are rolled around the cylinder to form the test web. The TRASHCAM then acquires the images. Two or three images are taken of each web and are then analysed. An algorithm is employed to analyse each image and the results obtained are transferred to the Windows interface which can present these results in 3 forms (histogram of size distribution, image of the SCF detected, ASCII files). The CATI software processes the image so as to compare the 'colour' information of every single pixel in the image to its close neighbour and highlights the pixels which are significantly different on the basis of fixed thresholds.

The effects of SCF on yarn quality

Cirad designed measuring tools such as the TRASHCAM/CATI to evaluate the negative effects of SCF on yarn characteristics (namely evenness and strength). An experiment where samples with or without SCF (SCF removed using tweezers) were spun to measure their yarn strength (Krifa, 2001 and 2002,) demonstrated that the higher the quality of the fibres, the more negative the effects of SCF.

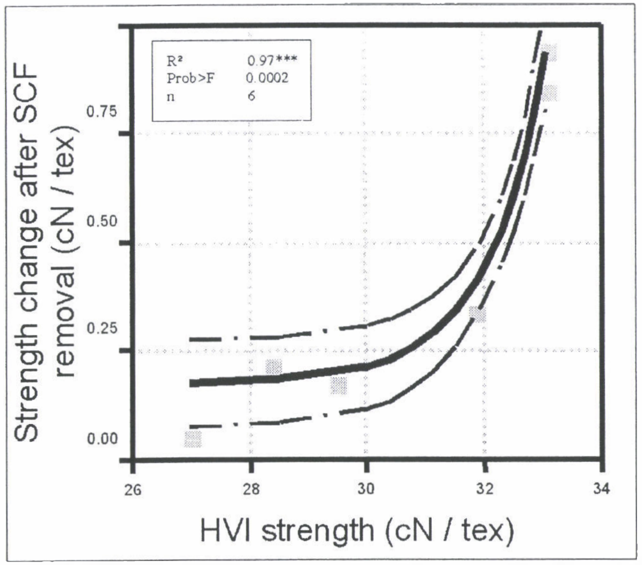

Figure 2: Yarn strength differences after removing SCF from the fibres of 6 cottons plotted against fibre strength (Krifa, 2001).

Breeding is a way to reduce the number of SCF in the lint

As no effective method has been found to remove SCF, Cirad used these tools in a breeding program to try to counter the SCF problem at its source. It was shown that SCF content may be reduced through breeding because this character has a significant level of heritability and a high level of variability. Varieties may therefore be bred that produce fibres with a low SCF content and suitable agricultural and technological characteristics (Bachelier, 1998,).

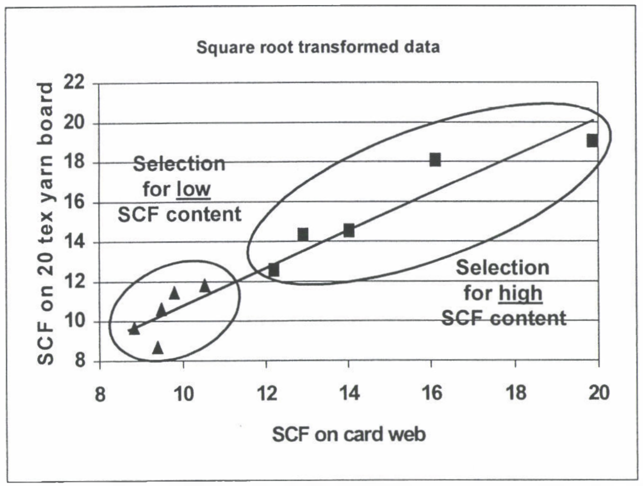

Figure 3: Breeding efficiency with regard to SCF (Bachelier, 1998).

From SCF to dark wool fibre counting

After a few preliminary tests, it was considered that TRASHCAM could be used to characterize wool samples by the detection of dark fibres. But, some tailor-made improvements are needed for sample preparation and image processing to meet the specific demands of the wool sector.

The basic idea was that techniques used for cotton may be applied to other fibres, and vice versa.

Objectives: modify CATI to characterize wool top samples and develop a preparation procedure for wool samples

Our overall objective was to develop an instrument and a procedure to measure the dark wool fibre content in wool tops since these are considered as a serious form of contamination by the wool industry.

The research conducted at Cirad (France) aimed therefore to adapt and modify the Cirad TRASHCAM system for the measurement of coloured fibre contamination in South Africa wool, while CSIR and UPE (South Africa) aimed to develop a sampling procedure and sample preparation system to ensure that suitable samples (wool fibre webs) were prepared for the TRASHCAM measurement.

Difference between SCF and wool contaminants

The detection of SCF relies on finding specific objects in a well contrasted image. SCF are compact and rounding shape () contrasting greatly with dark wool fibres ().

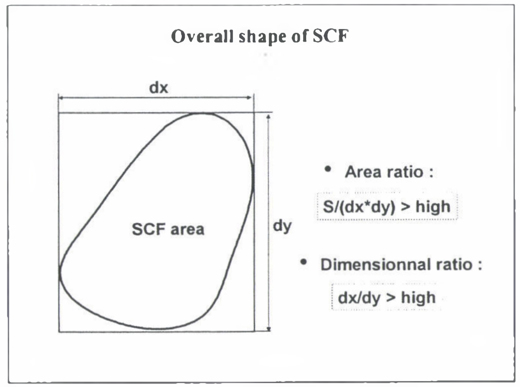

Figure 4: Appearance of a seed-coat fragment.

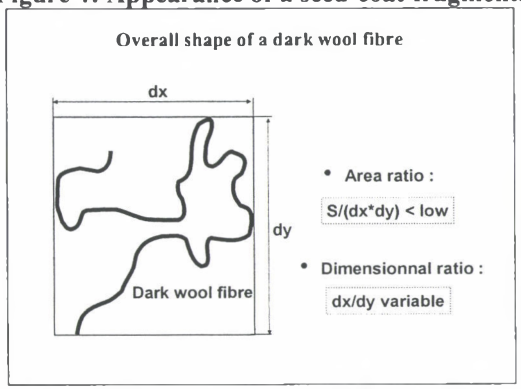

Figure 5: Appearance of a dark wool fibre.

The algorithm used for detection can be modified but rules must be followed:

- the software starts detection by comparing the grey-level of every pixel with a relative level calculated in relation to the background level; alternatively the hue level (H) of the pixel may be compared with the background.
- If this test is positive, then the pixel considered is taken into account in a new or existing impurity.
- When single pixels are detected as impurities, they can be merged to form larger objects after being tested for proximity, grey-level and/or hue.

When detecting objects using colours starting from grey levels, the software may become confused as each grey level corresponds to 65536 various colours in Red Green Blue format.
Thus, for this wool project, these constraints were taken into account for the creation of a new version of the software that can also be applied to SCF detection. This new version was then tested on two reference materials.

Constitution of a representative sample

It should be recalled that financial premiums and discounts are calculated on the basis of wool top quality parameters. If dark fibre content is to be considered as a factor in the marketing of wool then objective and precise measurements of agreed and representative samples are required. The current and agreed method is based on a standard procedure.

These standard samples are used to characterize various quality parameters in certified and recognized laboratories. After a visit to the relevant South African, internationally-accredited laboratory in Port Elizabeth, namely the Wool Testing Bureau, it was agreed that samples remaining after routine objective measurement tests could be used for the CATI analysis. These samples were scoured and Shirley Analysed at the Wool Testing Bureau.

Although such samples are accepted in the wool sector, determining the dark fibre content of non-greasy wool can only be considered as quantifying a rare event.

- In statistical terms, this means that, even if black or stained fibres are evenly distributed in the samples collected from these bales (this is an ideal case), the results will be highly variable because the objects counted are rare. The worst case is where the black or stained fibres are grouped together in aggregates at only certain locations in the bale. Such an occurrence may depend on farm management practices. Here it should be recalled that an economical threshold was placed at 100 dark or stained fibres per kilogram, corresponding to between 0 and 2 such fibres in an average of 12 grams.

- In practical terms, there was no certainty that black fibres would be found in the samples collected even if black or stained fibres were present in the bale from which the sample was taken. To counter this problem, it was decided that a given number of representative samples should be collected and analysed, and measurement tolerances - as well as probabilities in respect to these tolerances – should be established, discussed and accepted by the wool sector.

Development of a preparation method

For practical reasons, it was decided to begin by developing an operating method to detect very dark fibres such as pigmented fibres. Thereafter, an operating method was developed to detect more lightly coloured fibres such as stained fibres.

Detecting dark or stained wool fibres in a web requires the production of an even web (no fold, no disparity in fibre accumulation...)of homogeneous and pre-selected density, and which is very even.

In another words, such an analysis requires a homogenous wool web, for example produced using a mini-card. This is then stretched over the appropriate surface of the scanner which is turned on just after being closed. Once the detection has been completed, the web image can be analysed by CATI software provided the relevant parameters set at appropriate levels.

It was initially specified that samples were to be prepared and measurements made under standard atmospheric conditions, namely T = 21 ± 2°C and RH = 65 ± 2%.

A mini-card (which usually works well for cotton fibres) was used to prepare the webs. The number of revolutions of the wool fibres collecting drum determined web density. It was also important that the wool sample contained only very low levels of residual grease (to avoid greasy stains on the window of the scanning device) and was free of extraneous matter, the latter being removed by the Shirley Analyser.

Webs with densities of 25, 40, 60, 68, 74 and 137 grams/m² were prepared using this technique, then tested.

Reference wool materials

Two samples were used as 'reference materials' in this project since they contained a pre-determined number of coloured fibres:

- one sample contained around 2000 dark fibres per kilogram of wool,
- the other contained around 13 dark fibres per kilogram of wool.

Another sample without any coloured fibres was also used. Coloured fibres were added to the surface of this wool or into the web to check scanner and CATI sensitivity.

Results and discussion

Setting algorithm parameters for CATI

Both software versions were used to analyse images either as degrees of greyness (256 levels) or colour (up to 16 million levels). But grey-images were the first to be captured and analysed because they were faster to analyse and produced a smaller file for computer storage and management. These grey-level images were saved for subsequent use and to study the relationship between CatiV6 and CatiV7 results:

- CatiV6 seemed to be the most appropriate version for this project. It was therefore used to validate the feasibility of such measurements and to check progress made in preparation techniques ;

- then CatiV7 was finalised and used at the end of the project, and its results were compared with those of CatiV6 on the same set of images (grey level images).

Before being brought into its routine use, all settings must be selected so as to detect target features which in our case are black and stained wool fibres in fibre webs. This technical information is stored in 'parameters' files that are easy to load for daily and routine tests.

When used routinely, the first step for any version of CATI software is to select a 'parameters' file which contains image grabbing settings, information on where to store the data, algorithm impurity highlighting settings. Specific keys are then used to launch image acquisition and continue the process through to data storage.

A limitation was encountered when image backgrounds were insufficiently even, as caused by poor web homogeneity. Under these conditions, CatiV6 was unable to determine the correct number of impurities as shown in . This figure shows the grey levels of an image according to the position of the pixel in the image. Background characteristics in CatiV6 are calculated by taking account of the first pixels or lines in the images (the assumption is made that the image is homogeneous in colour), and these characteristics are applied for the complete image. If the image is heterogeneous as in the case for wool samples, CatiV6 may detect impurities that are in fact only background information (bottom right square in).

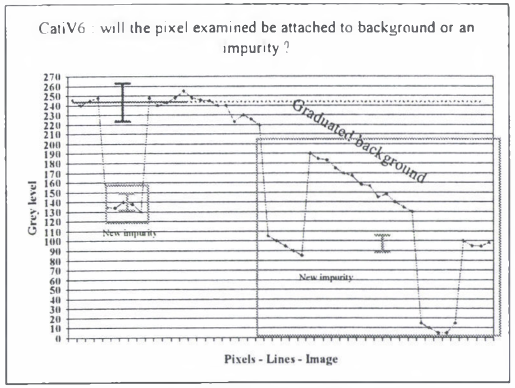

Figure 6: CatiV6 operating method.

By comparison, CatiV7 recalculates background characteristics for every pixel before it examines (pixel by pixel) the image. Under these conditions, CatiV7 is less dependent on the background colour stability of the images ().

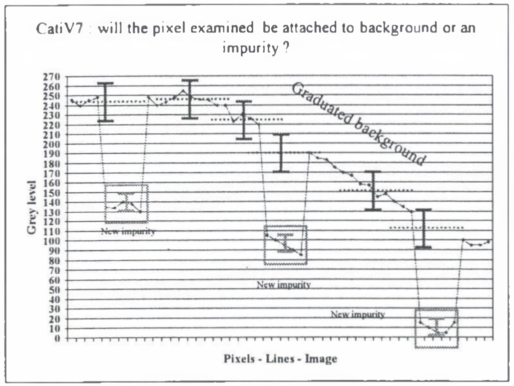

Figure 7: CatiV7 operating method.

Another technique is to detect regions as impurities by using absolute colour detection (). In this case, defects are found in the image thanks to thresholds that correspond to their typical colour.

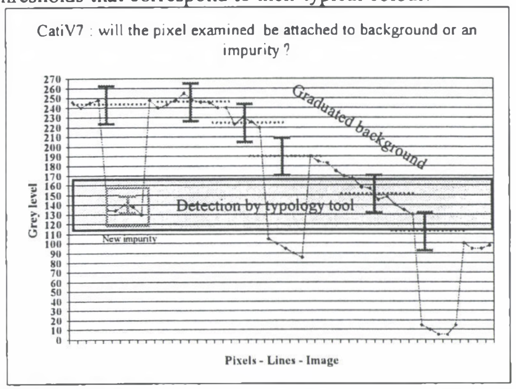

Figure 8 : CatiV7 mode of functioning when using object typology mode.

Studies were conducted to determine sets of parameters for the algorithm, taking account of web densities and for grey-scale images on the basis of reference materials.

Experimental results

Results obtained between 45 and 60 g/m² so far for black fibre detection. Stained fibres can be detected between 15 and 20 g/m². This web preparation procedure now has to be validated on a routine basis.

shows that a global background taken as the reference for highlighting impurities in images, does not allow their detection as the images having a graduated background. But when analysing the same image, CatiV7, using a local background, can efficiently highlight the fibres considered as impurities ().

Figure 9: Global background in CatiV6 unable to detect dark fibres.

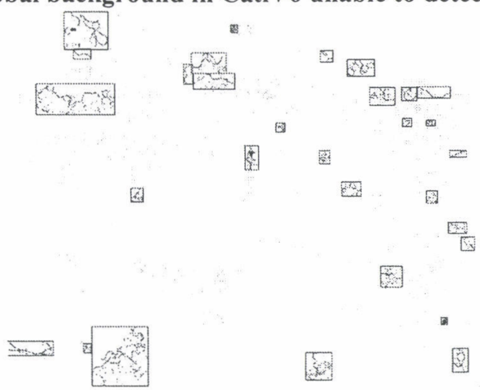

Figure 10: Local background in CatiV7 able to detect dark fibres.

We also checked that this progress made in dark wool fibre counting did not affect SCF counting in cotton webs.

Conclusion and perspectives

The work conducted in the course of this project was used to define method for preparing wool samples for the counting of black or stained fibres on wool webs. Suitable software was also developed for this analysis operation and the preparation and analysis steps were combined as a proposal for the counting of dark or stained fibres.

But although considerable progress has been made, the following tasks remain before the method can be used for routine tests:

- Check count precision, accuracy and quality
- Check whether samples are representative of a greater mass of fibres
- Create a device for preparing wool samples
- Check the ability of CATI software to count dark and stained fibres in a single operation: as CATI software is also able to analyse colour images, it may be possible to combine the two proposed procedures to count both dark and stained fibres.
- Define confidence intervals or grades for the measurements made using these techniques (preparation + software) as prices may be defined according to these measurements.
- Standardize this technique across the wool sector through Standardization Committees.

The aim set ten years ago of creating new low-cost software has now been met though the points listed above need to be addressed before rules for routine use can be set.

This technology can detect various objects in cotton fibre webs or in yarn boards, and can be used in other media (leaf disease, counting insect eggs, sizing rice grains ...).

We have also demonstrated that the basic principles of this detection are suitable for other characterizations.

NB : Part of this wool project was jointly funded by The Foundation for Research in the Republic of South Africa Development and the Ministère des Affaires Etrangères, de l'Education Nationale de l'Enseignement Supérieur et de la Recherche en France.

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DK 530965

CATI : Application of Image Analysis Systems For Seed Coat Fragment Detection And Other Fibre Characterization

Centre de coopération internationale en recherche agronomique pour le développement

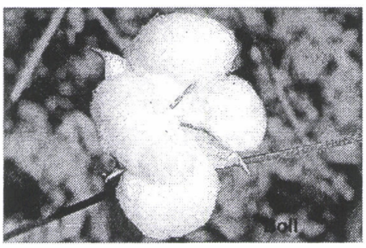
Jean-Paul Gourlot, Lawrance Hunter,
Michel Giner, Mohamed Boubaker, Jean-Yves Drean

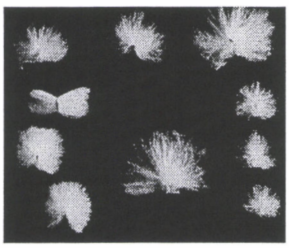
CIRAD CSIR ensitm

Plan of presentation

- Origine of Seed Coat Fragments (SCF)
- Counting SCF and consequences
- Detection : side effects
- Counting dark wool fibres
- Various ways of expressing colors
- How Cati takes background and colors into account
- Conclusion

Seed-cotton, seed, fibres … and SCF





Ginning
- Fibres
- Seeds

Seed Coat Fragments

Plan of presentation

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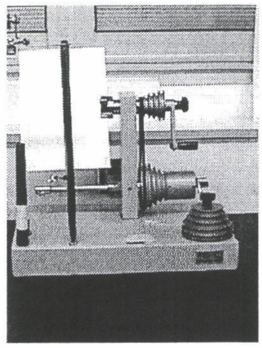
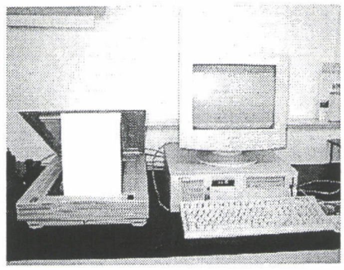
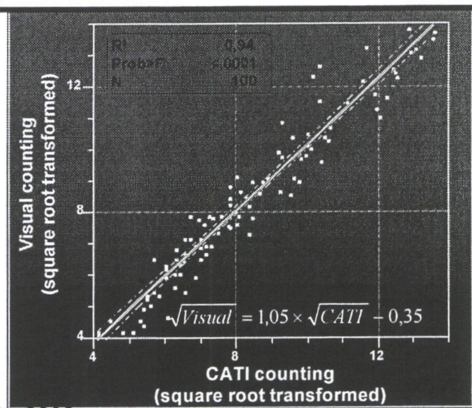
SCF detection thanks to CATI image analysis system



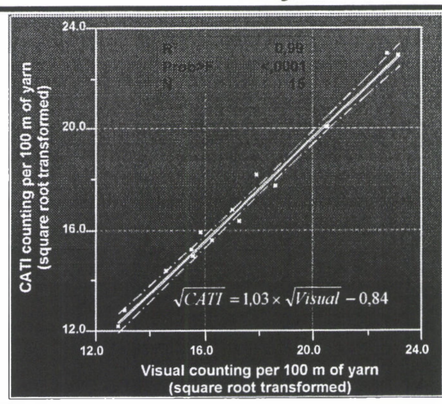


Visual vs CATI SCF counting on card web



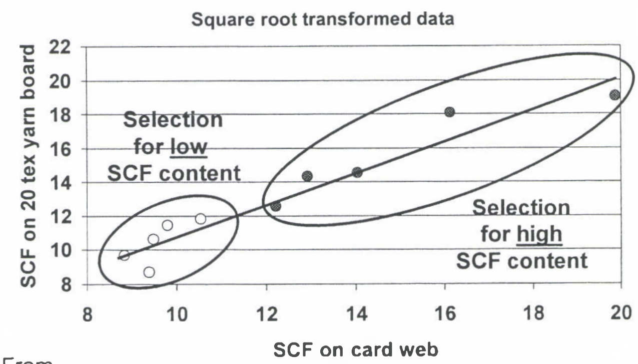
From Krifa, 2002

CATI vs visual counting on 20 tex RS yarn



From Krifa, 2002

Breeding efficiency towards SCF



From
Bachelier B. 1998

Plan of presentation

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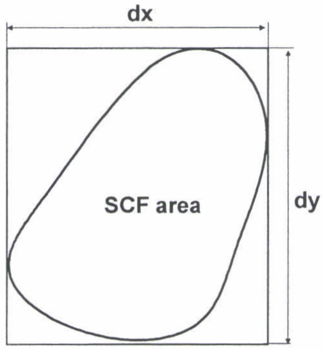
9

SCF overall shape



- Area ratio :

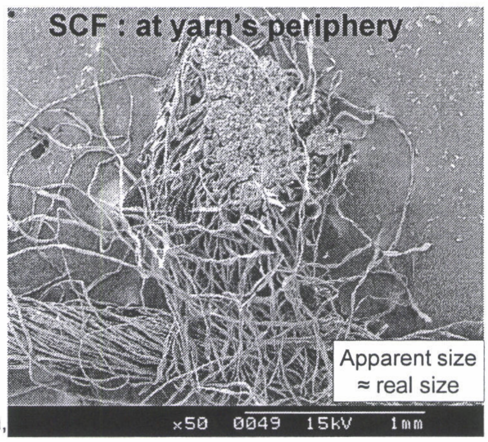
$\boxed{S/(dx*dy) > high}$

- Dimensionnal ratio :

$\boxed{dx/dy > high}$

10

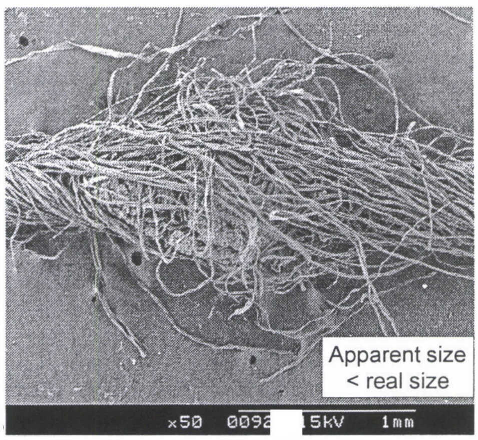
Position of SCF on the yarn



From Krifa,

11

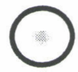
Position of SCF on the yarn



From Krifa

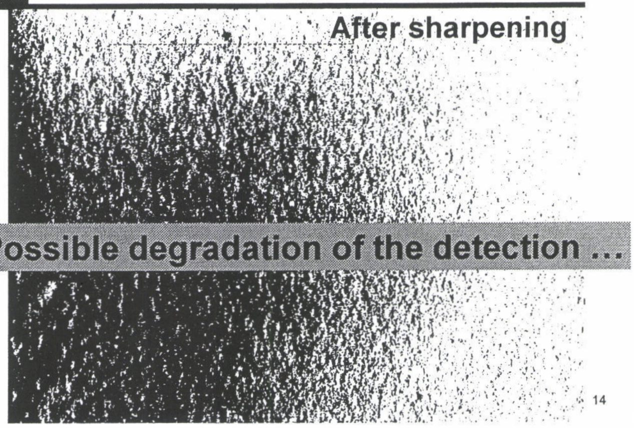
12

Cotton web with even background



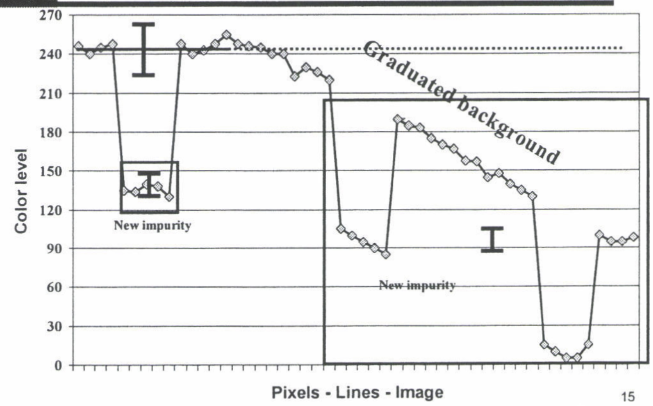
13

Cotton web with un-even background



14

CATIV6 : will the pixel examined be attached to background or an impurity ?



15

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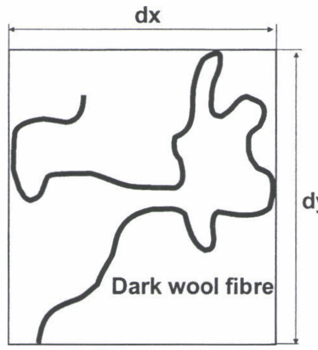
16

Dark wool fibres detection

- Goal :
  - Apply a tool designed for cotton onto another type of fibre
  - Check the detection ability of CATI on another type of object
  - Improve this ability
  - Check this improvements on SCF detection in cotton

Dark wool fibre overall shape



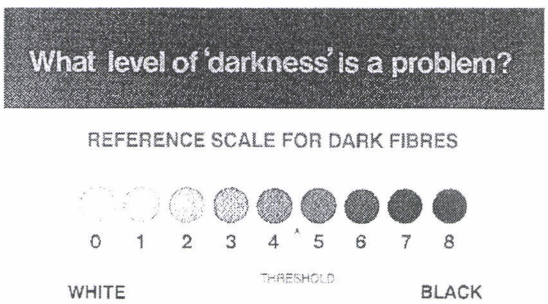
- Area ratio :

  S/(dx*dy) < low

- Dimensionnal ratio :

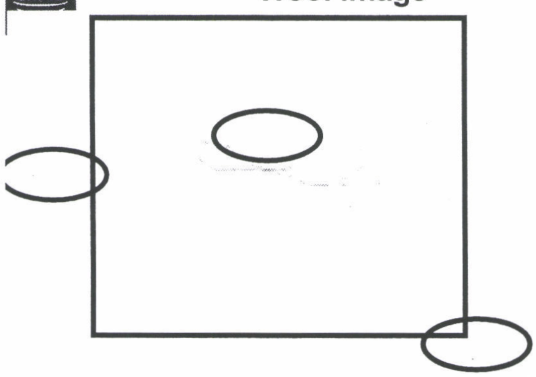
  dx/dy variable

Color limit in wool business



=> Need to use color detection

Wool image



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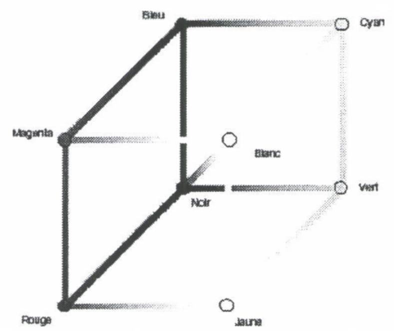
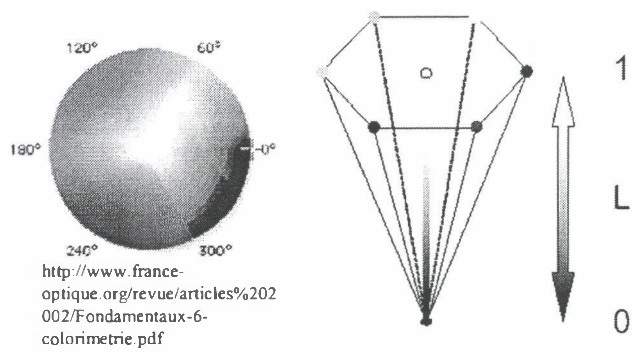
RGB color definition



http://bnazarian.free.fr/Cours/IN_GBM_01.PDF

TSL or Hue/Chroma/L color definition



http://www.france-optique.org/revue/articles%202002/Fondamentaux-6-colorimetrie.pdf

http://bnazarian.free.fr/Cours/IN_GBM_01.PDF

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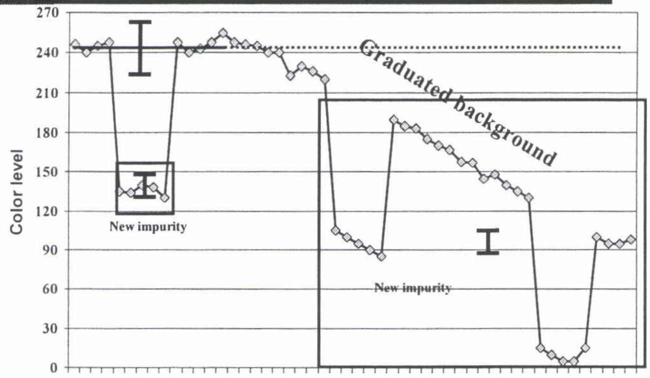
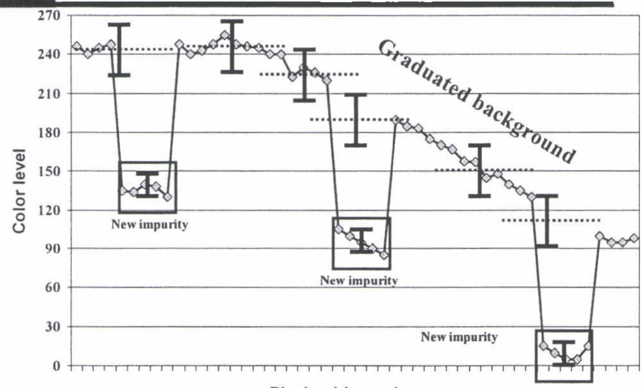
CATIv6 : will the pixel examined be attached to background or an impurity ?

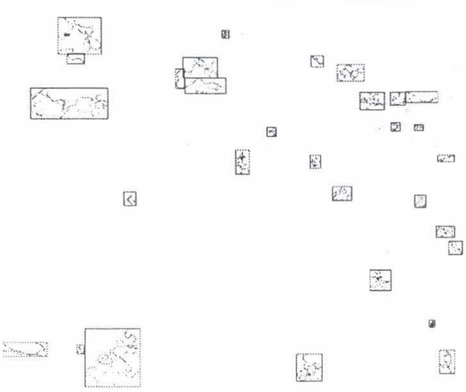


Counting dark wool fibres in case of fixed background

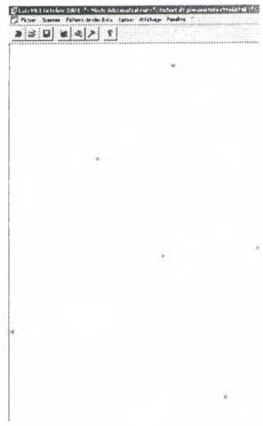
CATIv7 : will the pixel examined be attached to background or an impurity ?



Counting dark wool fibres in case of mobile background (CATIv7)



CATIv7 on card web for SCF detection



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Conclusion

Results were gained during this project:

- A preparation method has been proposed for wool samples to be able to count black or stained fibres in wool webs.
- Accordingly, a software and its settings were proposed during this project.
- In summary, two procedures comprising one typical preparation followed by one operation with CATI were proposed for dark fibres and stained fibres.

Conclusion

- Check the precision, accuracy and quality of the counting
- Check the ability of the samples to represent a greater mass of fibres
- Create a preparation device for wool samples
- Check the ability of CATI software to count dark and stained fibres in a single operation
- Standardize this technique across the wool sector through Normalization and Standardization Committees.

Conclusion

- This technology seems to be efficient for detecting various objects to be detected or in cotton fibre webs or in yarn boards or any other medium (leaf disease, counting insect eggs, sizing rice grain ...)

- We then demonstrated that the basic principles of detecting are easily suitable in other characterizations.

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développement

Thank you

for your attention

Sampling Issues For Cotton Fibre Quality Measurements
Part 2: Impact on Cotton Testing Instrument Results

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Abstract

The cut cotton sample used for the commercial evaluation of cotton bales is taken at a single point from one or two sides of the bale. It should be verified that this sample is sufficient to perform quality measurement that is adequately precise to avoid litigation. On one hand, the variability of the H2SD stickiness measurement within a bale has been addressed by Gozé (2002) and Frydrych (2004) who showed that stickiness was variable within a bale. On the other hand, the studies about the within-bale variability of the other fibre characteristics measurements, while available for US cotton, are very few in a small farmers context.

In another growing country where cotton is grown by small property holders, we achieved a study on technology of farmer's cotton fibre. Our study compared cotton technology of cotton farmer's samples, in four villages located in contrasted ecological conditions. Results show a broad range of quality between localities and between farmers. As in many producing countries, seed-cotton fed in the ginning plant comes from successive modules that may originate from different localities and farmers without taking into account the quality consequences, a strong variability of fibre characteristics inside a bale could result.

When preparing a bale, different layers of cotton are superimposed by a tramper before pressing. Our hypothesis is that within-bale variability is concentrated between the layers (vertically) whereas within-layer variability (horizontal) is lower. If such is the case, specially designed samples taken from the entire side of the bale, i.e. in the form of a superficial strip involving all the layers, should be more representative than a simple cut cotton sample that involves only few of the layers.

We tested this hypothesis by means of a sampling study involving 24 bales from 4 different origins. A three-dimensional matrix of 8x2x2 was used to study the variability in all 3 directions of the bales. Also, a comparison between the conventional cut cotton sample and the superficial vertical strips determined which method, in practice, gave the best results.

The H2SD results clearly showed in the first part of this study (Frydrych, 2004) that the new sampling method is interesting to reduce the H2SD measurements variability. This paper reports the results about other fibre technological measurements on the same samples.

Introduction

Most of the time, samples are drawn out from the bale with a rectangular punch which cuts in one or both external layers of the bales to perform quality characterizations on cotton bales. One or two rectangular samples of approximately 100-150 grams, 180 * 80 mm wide and 50 mm thick are extracted from the bale for quality assessment. The fibres contained in these two samples are supposed to be representative of the whole bale.

Many articles have been published in the 90's in the United States of America to study the representativity of such samples for commercial purposes and its importance on measurement precision (Boyd, 1993; Moore, 1994; Sasser, 1992…). In these cropping conditions – large farms, mechanical harvest, module building, and module feeder at the gin, etc. – precision, accuracy, repeatability and reproducibility are satisfactory as fibre bales can be considered as homogeneous.

The within-bale variability originates from the within-field variability, added to a part of the between-field variability in the case where seed-cotton from various field is mixed.

- In USA, the number n of bales per field may be very high. Then $1/n$, the probability of mixing seed cotton from two different fields is very low. Plus the within-field variability is expected to be small.
- In other conditions, the within-field variability can be high, and as the fields are small, the number of bales per field n is small. Then the probability of mixing the cotton of at least two different fields in a bale is rather high.

In addition to that point, we may introduce another origin for the variability: some countries offer a wide choice of variety to be planted, while other only offer a few varieties.

As an example, concerning 2003-2004 crop in Florida, we observe that cotton seeds from Deltapine varieties are more than 97% of the total (Table 1). (sources: addresses 1, 2 and 3 in bibliography)

Table 1: Distribution of Deltapine varieties within Florida.

Variety	*Percent*
DP 436 RR	1.89
DP 449 BG/RR	0.42
DP 451 B/RR	10.30
DP 458 B/RR	33.47
DP 468 BGII/RR	0.49
DP 555 BG/RR	34.42
DP 655 B/RR	1.40
DP 5415RR	6.09
DP 5690RR	9.35
Total	**97.83**

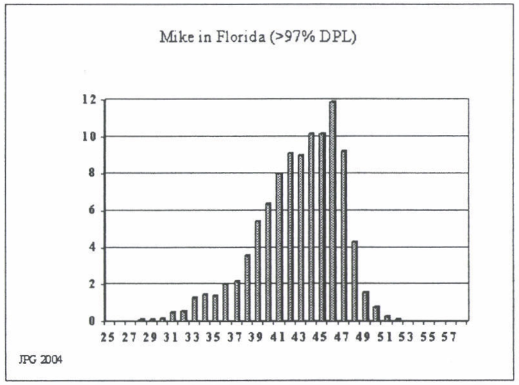

Figure 1: Micronaire distribution in Florida when DPL varieties cover more than 97% of the planted cotton.

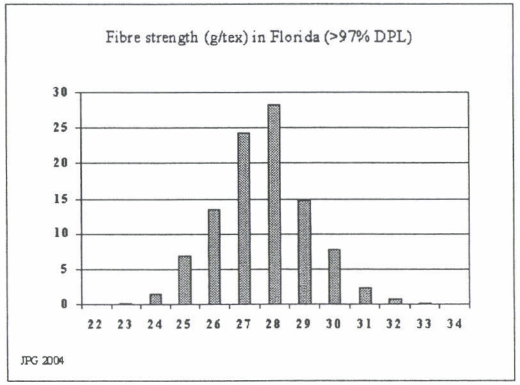

Figure 2: Strength distribution in Florida when DPL varieties cover more than 97% of the planted cotton.

The distributions of micronaire and strength measured on the harvested fibre show much variability (Figure 1 and

Figure 2).

Thus, at this point, we may wonder about the within-bale variability for the same parameters. Indeed, as seen from outside USA, we do not know well the probability of feeding a single gin plant by mixing seed-cottons from different modules combining cottons from different varieties or growing locations or growing conditions which led to observe those between-bales distributions in Florida.

Otherwise, few papers have been published in the context of small scale cotton farming and gin plants fed by telescope that may induce larger variability than the one observed in the previous situation.

Material and method

We studied by a survey the variability originating from the within and between cotton fields in one producing country. In a consumer country, we made a sampling experiment to measure the within-bale variability and the precision of various sampling methods.

The survey can be used to quantify the possible between-bale variability that can be observed in another producing country than the USA, and one can compare its results to the information presented in introduction. The sampling experiment is designed to compare the merits of several sampling methods and check if the sampling error magnitude is acceptable.

Field survey

Cotton is produced in a small holder country in strict pluvial conditions. The average field measures 1.2 ha for an average yield of 1.05 ton of seed-cotton per ha. Thus, each producer sells an average of 1.26 tons of seed-cotton. Marketing is organized by the grower's association of the village by putting together seed-cotton produced by several farmers. Ginning companies buy the whole production of all the villages that they have been attributed by the national Cotton Association. Seed-cotton from all the growers in a village is dispatched in different modules according to its seed-cotton grade. When arriving at the ginning plant, seed-cotton 'modules' are stocked separately and successively ginned. As in many producing countries, seed-cotton feeding the ginning plant comes from successive modules. It may then happen that two modules contribute to the same bale. This can occur in the USA conditions as well.

The between field and within field variability were observed in four villages situated in contrasted areas of the country.

Description of climate conditions and cultural practices

We chose to study cotton fibre quality from four villages selected in the main region of cotton production. Location (A) is at the centre of the cotton production area, yields are high and climate is very favourable (Table 2). Rainfall starts in June and stops in mid-October. Location (B) conditions looks like those of location (A).

Location (C) and (D) conditions are a little bit different: rainfall starts in May and stops in the end of October. Rainfall events are much more important than in (A) and (B). Weather is often cloudy in August. Sowing dates are extended in (C) and (D) due to a lack of mechanisation while (A) and (B) uses animal or motorized traction to sow.

Table 2: General information about the producing areas within the producing country.

	Rainfall in mm	*Daily insulation from July to November in h*	*Sowing period durations in days*	*Average yield in kg/ha of seed-cotton*
A	1046	8.2	40	1736
B	1000	NA	45	1479
C	923	6.8	60	1120
D	1080	5.9	55	1177

NA : data not available but should be between (A) and (D).

Sampling of the seed-cotton in the villages

Seed-cotton samples were taken in farmer's cotton fields. A typology of farmers exploitations were previously done in each village to cover the cotton cultivation practice variability, four to five categories were identified. Four to six farmers were chosen in each category according to the relative weight of each category. A sample of seed-cotton was taken in each farmer fields at a typical location. In case of an important visual within-field variability, two or three samples were taken instead of one. Each sample was harvested on 16m². The harvest of seed-cotton was splitted: the first took place 120 days after planting and the second was made 150 days after planting. Seed-cotton samples were ginned with a "20 saws" gin stand and 200 g of fibre were taken by picking 20 subsamples by hand. Fibre quality parameters were measured using an HVI® instrument at CIRAD Montpellier, France.

Sampling experiment on commercial bales

On the commercial bale experiment, bales from 4 worldwide cotton origins (different from the first experiment) were sampled in four different ways in order to check the homogeneity of fibre characterization results. In order to keep a good level of confidentiality for the results, the origins of these bales were encoded by numbers: 1 (8 bales), 2 (5 bales), 3 (5 bales) and 4 (6 bales). Previous results using these bales were presented during the Beltwide Cotton Conferences in 2004 by Frydrych who was checking the within-bale variability of stickiness.

Four ways of sampling were used:

- One sample was taken in the bales as the rectangular punch would do on bottom and top layers of the bale (total : 2 samples per bale, Figure 3) ;

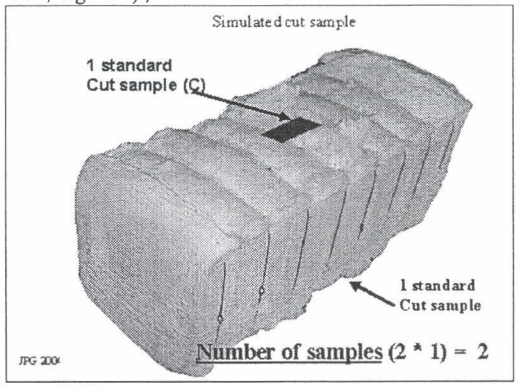

Figure 3: Sample taken as a rectangular punch would do.

- Two other samples from the top and two from the bottom of the bales were taken to check the variability of parameters within those layers of the bales (total: 4 samples per bale, Figure 4) ;

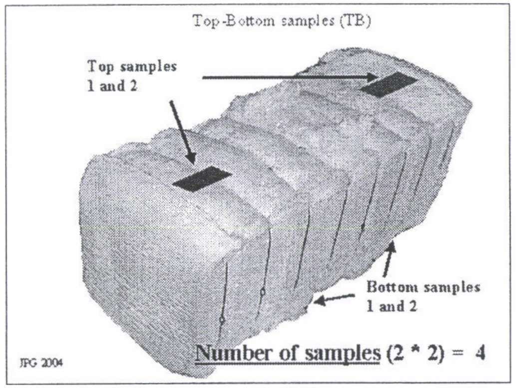

Figure 4: Top and bottom complementary samples.

- Eight layers regularly spaced were selected. In each layer, a sample was taken from each of the four corners (total: 32 samples per bale, Figure 5); these 32 samples allowed the most precise estimation of the bale mean characteristics, therefore they played the role of the reference sample in this study.

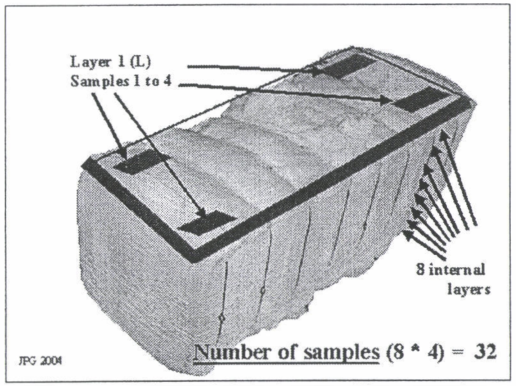

Figure 5: Layout of eight-layers of four samples

- Four samples were taken from 4 strips along the sides of the bales using a specific sampling device. This sampler is made of a cylinder covered by a card wire that grabs fibres along the sides of the bales. The fibres are then removed from that cylinder with an air-stream that drives the collected fibres into a collecting can (Figure 6 and Figure 7).

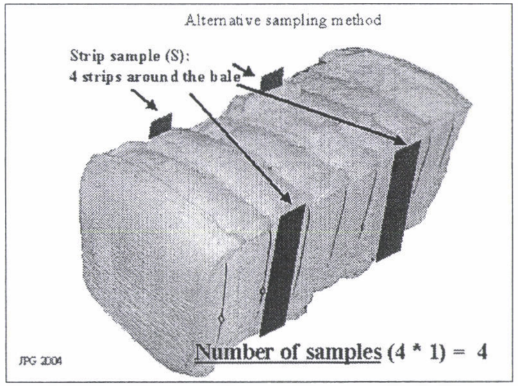

Figure 6: Four strip samples around a bale.

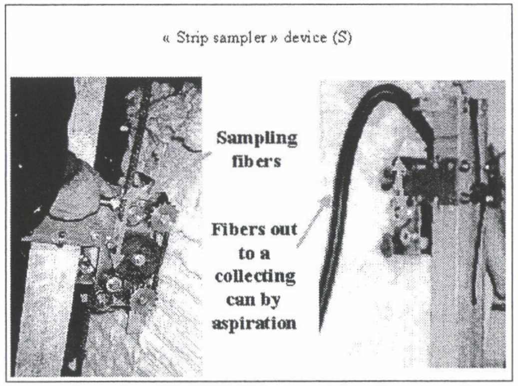

Figure 7: Strip sampler device used for the experiment.

The 1008 samples (42 samples per bale, 24 bales) collected were analysed using a Spectrum® equipment from Uster Technologies® (this use does not constitute any type of recommendation for this equipment). Samples from every bale and from every origin were analysed in a random order. We made two readings of micronaire and six readings of length, strength and colour parameters per sample.

Results and discussions

Field survey

For every bale characteristic measured, the village means were compared at 5% level with a multiple comparison test. Because the sample sizes and standard deviations were different from one village to another, we used the Tukey test as modified by Kramer.

Micronaire

The Figure 8 shows data from that part of experiment. Location (A) has a high IM average and quiet uniform amongst farmers while location (D) has a low IM average with a high level of standard deviation. All differences are significant.
The two other situations, location (B) and location (C), can be considered as a transition between location (A) and location (D). These data can be linked with insulation and yield data in Table 2.

More mature fibres and longer fibres are produced in high insulation conditions: location A has a very high day insulation duration compared to other locations.

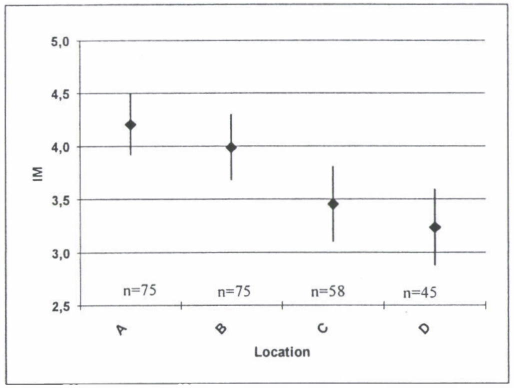

Figure 8 : Micronaire vs producing area: mean and standard deviations.

Fibre length

Data shows significant differences between averages of Mean Length (ML in mm). Location (A) produces fibres with ML exceeding by 2 mm those produced in location (D) (Figure 9). All villages are statistically different from one another, except B and C.

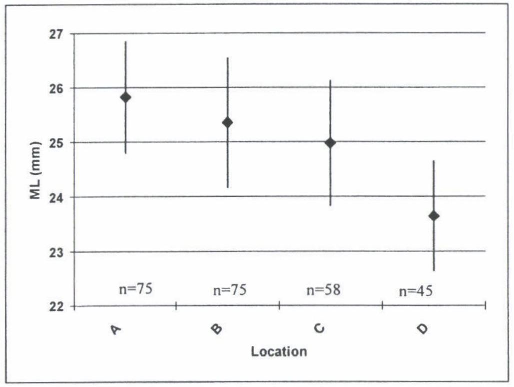

Figure 9: Mean Length (mm) vs producing location: mean and standard deviations.

With Upper Half Mean Lengths (UHML), the locations rank is the same order as for ML (Figure 10), with the same significant differences.

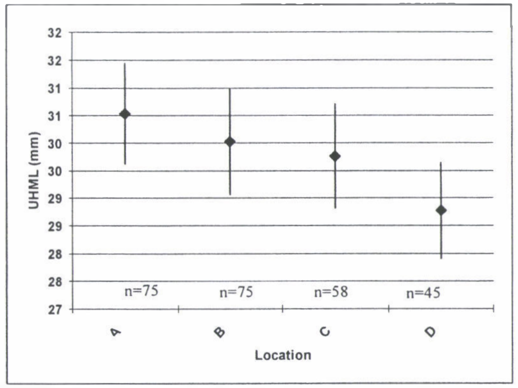

Figure 10: UHML (mm) vs producing location: mean and standard deviations.

Maturity ratio (MR)

IM is the fibre characteristic that varies the most between villages (Figure 11). The differences between villages can be explained by the cultural practices: in location (A) and location (B), the sowing period duration is 40-45 days while it is 55 to 60 days in location (C) and location (D). A multiple mean comparison test indicates that all villages differ from each other by their MR averages.

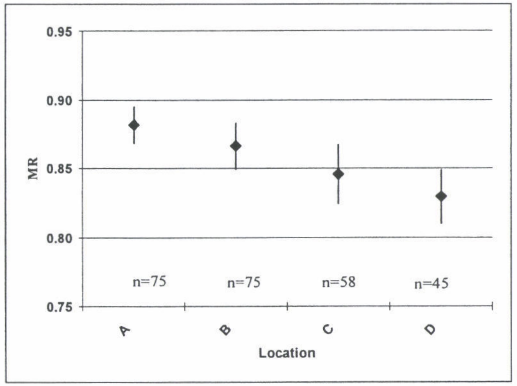

Figure 11: Maturity vs producing location: mean and standard deviations.

Evidence is shown that fibre technology is variable between villages because of climate conditions and cultural practices. Some villages have a low level of variability for fibre parameters while others have a larger one.

From this survey, we see that some heterogeneity of fibre characteristics may occur in bales from this country. This may be the case as well as in other small land holder countries.

Commercial bale sampling experiment.

The aim of this experiment is to answer two types of questions:

- For a given bale, do all kinds of samples yield the same average (apart from measurement errors) or are some samples biased?
- Are some sampling methods more precise than others? Do some sampling methods generally give estimations closer to the bale mean than other ones?

In fact, we do not know the exact bale mean, but we make the hypothesis that the 8 layers x 4 columns samples mean does adequately measure the bale mean.

As we have some replications, we can infer the precision of the method from the difference between the replicates, with a classical analysis of variance (ANOVA) scheme.

As the bale is made of successive layers, we model the within-bale variations with a hierarchical model: Y = mean + layer effect + column effect + error, with the column effect depending on the layer considered (the column effect is nested within the layer effect).

All the effects are considered random. Some covariance could arise between layers close to one another, but in fact we did not find any. We thus analysed the results with a plain variance components model.

The layer and column effects were estimated separately for the different kinds of samples, to allow some differences in variances due to the different shapes of the samples. Again, we did not find any heterogeneity of the layer effect variance between the different kinds of samples (this was tested with a likelihood ratio test). Nor was the case for the column effect. By contrast, all the variances would generally vary from one bale to another, thus making it impossible to infer a universal precision valid for all the bales: it generally had to be calculated separately for each bale.

The sampling variance is inferred from the between layers and between column variances as follows: when a sample is taken from p different layers, with q different columns in each, and when r measurements are made overall, the variance of the result is (equation 1):

$$\sigma^2_{Layer}/p \quad + \quad \sigma^2_{Column}/pq \quad + \quad \sigma^2_{Error}/r \qquad \text{Equation 1}$$

Thus, when two length measurements are made on a double sided cut sample, the sampling variance of the result is readily calculated (equation 2):

$$\sigma^2_{Layer}/2 \quad + \quad \sigma^2_{Column}/2 \quad + \quad \sigma^2_{Error}/2 \qquad \text{Equation 2}$$

For a "top+bottom" sample, with two columns in each layer, there are two layers and 4 column * layer combinations sampled, and the sampling variance becomes (equation 3):

$$\sigma^2_{Layer}/2 \quad + \quad \sigma^2_{Column}/4 \quad + \quad \sigma^2_{Error}/2 \qquad \text{Equation 3}$$

A strip sample scans all the layers of the bale: the layer effect then cancels, so the layer variance component does not contribute to the sampling variance. For a double-sided strip sample, the sampling variance is then (equation 4):

$$\sigma^2_{Column}/2 \quad + \quad \sigma^2_{Error}/2 \qquad \text{Equation 4}$$

The sampling variances were calculated from these formulas. The variance component model parameters were estimated with the restricted maximum likelihood method (REML), using the mixed procedure of SAS software, version 8.2. Mean comparison tests with the usual Dunnet multiple comparison adjustment were carried out to detect any difference between each sampling method and the 8-layers samples taken as a control.

Three variables were analyzed: length (mm), strength (g/tex) and micronaire. The comparison of means shows some significant bias on some occasions for the strip sampler. However, this bias is always small and, though significant, can be neglected for commercial purposes.

Variance components

As an example, the square roots of the variance components of UHML are listed in Table 3 and Table 4.

Table 3: Standard deviation of the sampling error components listed by origin.

UHML	*σ Layer*	*σ Column*	*σ Error*
Origin 1	0.11	0.03	0.59
Origin 2	0.00	0.18	0.55
Origin 3	0.08	0.11	0.51
Origin 4 (*)	0.21	0.16	0.68

(*) the standard deviations vary from one bale to another. See table 4 for details

The layer component has a quite different contribution depending on the origin: not detectable for origin 2, it is 0.1 mm on origin 1 et 3, and 0.2 mm on origin 4. The column component also varies in magnitude from one origin to another. The residual standard deviation is roughly the same for every origin, although it is significantly higher for the origin 4.

This residual variation is dominant over all the other components. Remember that the squares of the standard deviations add up to the sampling variance: on the variances the difference in magnitude between components is even more important. Compared to the error component, the other components are almost negligible.

Table 4: Standard deviation of the sampling error components listed by bale in origin 4.

UHML	*σ Layer*	*σ Column*	*σ Error*
Bale 1	0.00	0.24	0.80
Bale 2	0.21	0.06	0.49
Bale 3	0.15	0.12	0.74
Bale 4	0.44	0.00	0.55
Bale 6	0.00	0.13	0.78

For origin 4 (Table 4), the variance components are more evenly distributed among layers, column and errors effects. Still, the error component is far higher than the other effects.

For micronaire and strength, the variance components differ from one bale to another for every cotton.

Sampling standard deviations

Figure 12 to Figure 14 compare the sampling standards errors of the strip sample with that of the cut-sample, computed from formulas 4 and 2 respectively. To perform the calculations, we retained the conditions of 2 measurements per sample for length and strength measurements, and one measurement for micronaire and modified the formulas accordingly.

To prepare the Figure 12, we checked that within-sample variances were homogeneous for UHML (Upper Half Mean Length). The origin (4) was heterogeneous, but we chose to represent its mean point anyway. The more detailed analysis of origin 4 is presented in Figure 13, where each point corresponds to one bale.

Figure 14 and Figure 15 show standard errors for strength and micronaire respectively, where each point represents one of the 24 bales from that research, as the variances components differs from one bale to another for every origin.

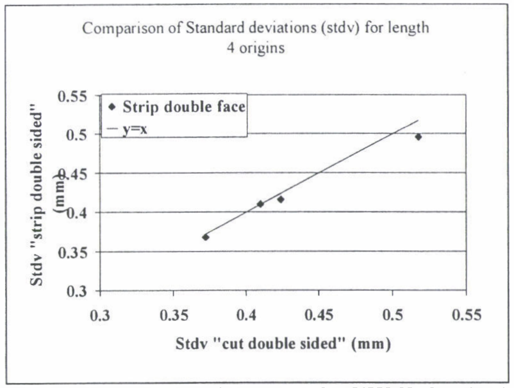

Figure 12: Comparison of standard deviations (mm) for UHML for the 4 origins of the bales.

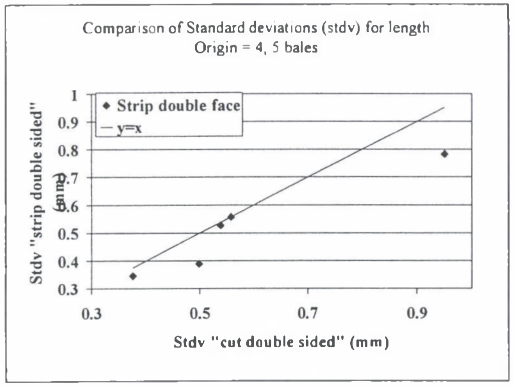

Figure 13: Comparison of standard deviations (mm) for UHML for the 5 bales from origin 4.

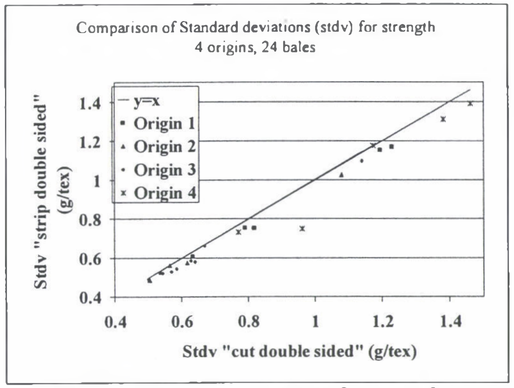

Figure 14: Comparison of standard deviations (g/tex) for Strength for the 24 bales from 4 origins.

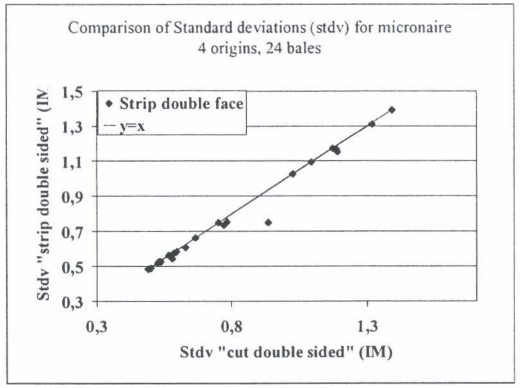

Figure 15: Comparison of standard deviations for micronaire for the 24 bales from 4 origins.

The computed standard error for the strip sample is always slightly inferior to that of the cut sample. This is to be expected from the cancellation of the layer effect. However, the dominating variance is the error variance, and the column and layer variances are much smaller. As a result, the sampling variance of the strip sampler is not very different from that of the classical cut sample: both share the "residual error" component of variance which can only be reduced by augmenting the number of measurements per bale.

Comparison with the recognized acceptable error of the measurements

An unexpected result is the high level of variability that is observed for all parameters.

For commercial purposes, internationally agreed tolerances for the measurements are given in Table 5.

Table 5: Internationally agreed tolerances for measurements.

	Confidence interval
IM	(+/-) 0.1 unit
Length	(+/-) 0.02 inch
	(+/-) 0.51 mm
Strength	(+/-) 1.5 cN/tex

From Sasser, 1992.

In the case of UHML, the norm for the confidence interval is +/- 0.02 inch that requires a standard error of 0.01 inch, that is to say 0.25 mm. From Figure 12, we can see that none of the two sampling procedures yield an acceptable precision, whatever the origin.

On the bale wise results from origin 4 (Figure 13), the precision with two replications is also not acceptable for commercial purposes. To obtain an acceptable precision one should increase the number of replications by a factor of 2, 5 or even 10 depending on the bale.

For strength (Figure 14), the precision is acceptable for commercial purposes for 17 out of the 24 bales. Doubling the number of measurements would have been enough to achieve an acceptable precision for all the bales.

For micronaire (Figure 15) also the acceptable precision is far from being achieved.

As the variability is not the same for every origin, and not even for every bale of the same origin, the classical notion of confidence interval should not be considered as an unchanging fixed quantity: rather, it should be viewed as a random quantity varying from bale to bale.

Thus our study seems now very modest: with only 4 origins and circum 6 bales per origin, we merely have a small sample of all the possible standard errors, and it is still difficult to infer a number of replications that would safely keep the standard error under the maximum acceptable value. For this we would need to widen this study to a more considerable number of bales.

However these few bales are enough for us to draw everyone's attention: in some occasions, the number of measurement usually made on commercial samples is not enough to achieve the expected precision.

As we noticed that it was not possible to get a general set of statistical rules for all bales in this study, it will probably be necessary to get rules for sampling and performing fibre analysis per producing area or country. We may also consider a trade off between the number of costly measurements needed to improve the precision and the commercial benefit gained from this improvement.

When this will be achieved, results from measurements can help in improving the organization of seed-cotton collection, seed-cotton ginning, and sampling procedures.

Conclusion

In this paper, we show that it may exist within-bale variability that could affect the representativity of samples drawn out from these bales.

Two examples helped in drawing this conclusion:
- For micronaire and strength measured on samples from one specific growing location within the USA, we saw that the distributions of these results can be wide when we look at the between-bale results. It is possible that, for some specific bales, fibre characteristics in these bales may vary.
- In another growing country, where seed-cotton was picked in various locations and ginned separately, fibre characteristics were also much variable from one place to another. Again, it is possible that fibres from various characteristics may be mixed in some bales.

It was then important to check if the samples yielded precise enough picture of the fibre characteristics in the bale.

A special experiment was set up to check various methods of sampling onto the within-bale distribution of fibre quality parameters. A new sampling device, the strip-sampler, was also tested. The fibres characteristics measured on samples from these sampling methods indicate that:
- it may exist a within-bale variability for all parameters measured in some origins; however, the dominant cause of sampling error is the lack of measurements
- With the standard number of replications, the cut-sample is not precise enough to avoid litigations.
- The strip sampler seems to provide samples that are more representative for variable bales than a cut-sample; however, the number of measurements per samples remains the important factor that improves the reliability of data produced per bale.
- Even though we assumed that the strip sampler grabs an equivalent amount of fibres in every layer of the bales, the prototype can be improved in order to insure that most of the layers of the bales are sampled, especially for origins which encounter within-bale variability problems.

As a general conclusion, it will be important to check the within-bale variability level on a wider experiment made on a larger set of origins in order to prepare sets of rules defining better sampling procedures, and the best number of measurement per samples in order to respect some agreed trade tolerances.

Acknowledgements

We are particularly grateful to Valrupt Industries company (France) who let us sample bales in their facility and who provides us cotton samples for the "Sampling experiment on commercial bales" part of this article.

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Sampling Issues For Cotton Fibre Quality Measurements

Centre de coopération internationale en recherche agronomique pour le développement

Part 2 : Impact on Cotton Testing Instrument Results

CIRAD
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ENSITM
Dréan J.Y. - Liu Rui

Introduction

Facts

– The technological evaluation of a bale is based on a normalized sample taken from one or two sides of this bale,

– Previous studies have shown that H2SD stickiness is heterogeneous within a bale.

Outline of presentation

- **Introduction and objectives**
- Materials and methods
- Results and discussion
- Conclusion

Introduction

Questions

– For UHML, strength and IM, do standard sampling methods yield results precise enough for commercial transactions ?

– Can we improve this precision by using a better sample ?

Introduction

Cotton as industrial crop ...

– Large fields
– Picking machines
– The cotton of one field fills several modules

All these aspects contribute to a good seed-cotton homogenization

Objectives

- Measure within-bale cotton characteristic variability within several bales from various origins
- Compare results obtained with several sampling methods

Introduction

...vs cotton grown by small-holder farmers

– small fields (< 1 ha)
– variability in cultivation conditions
– hand picked cotton
– a single module typically contains the output of 15 different fields.

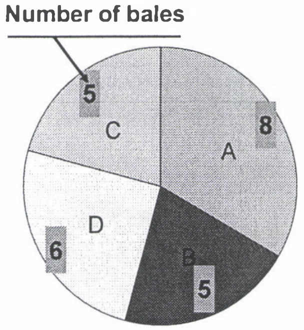
The seed-cotton is not so well homogenized

Outline of presentation

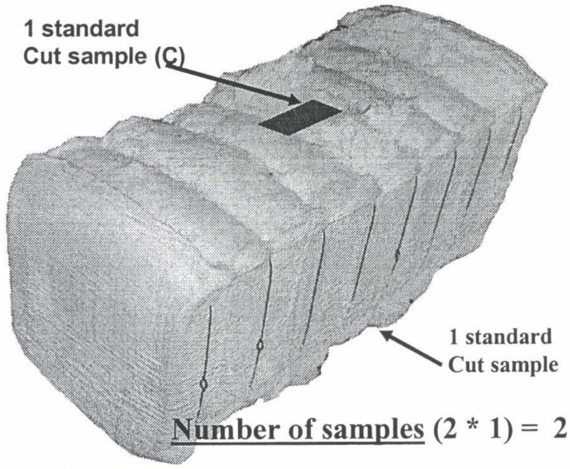
- Introduction and objectives
- **Materials and methods**
- Results and discussion
- Conclusion

Material and method

- 24 bales were selected from 4 origins A, B C and D, located on 3 different continents



Simulated cut samples

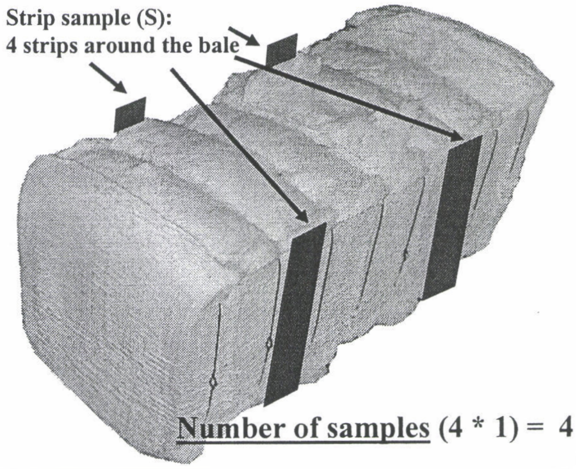


Material and method

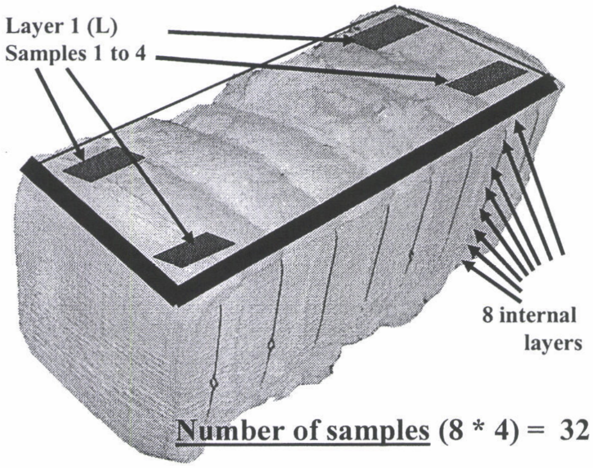
within each bale, 4 types of samples were taken

- multilayer sample = 3-dimensional grid
- cut sample (mimics the commercial sample)
- top+bottom sample (checks the cut sample)
- strip sample (spans all the layers in a single strip)

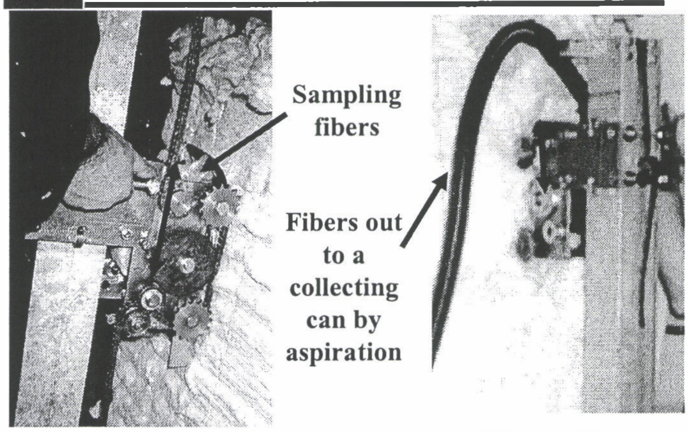
Strip samples



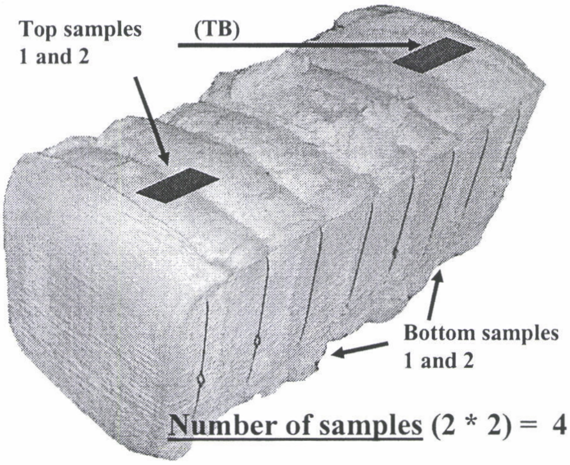
Multilayer samples



« Strip sampler » device



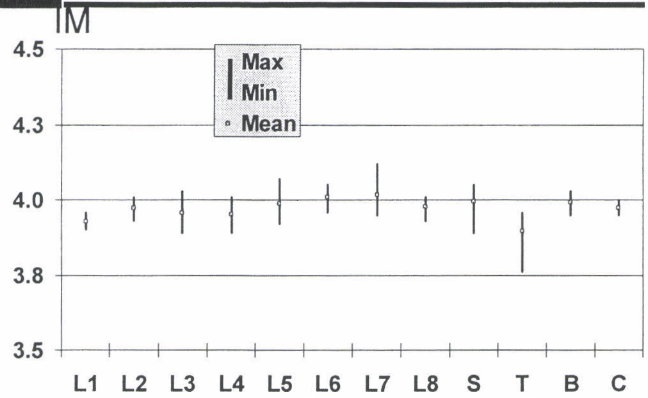
Top+Bottom samples (TB)



Outline of presentation

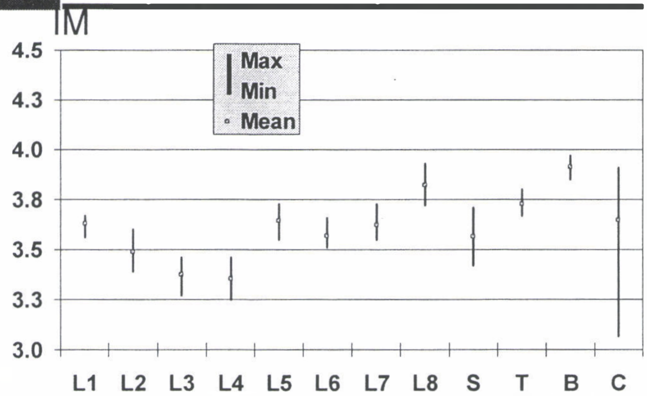
- Introduction and objectives
- Materials and methods
- **Results and discussion**
- Conclusion

Results : Origin B, bale 2



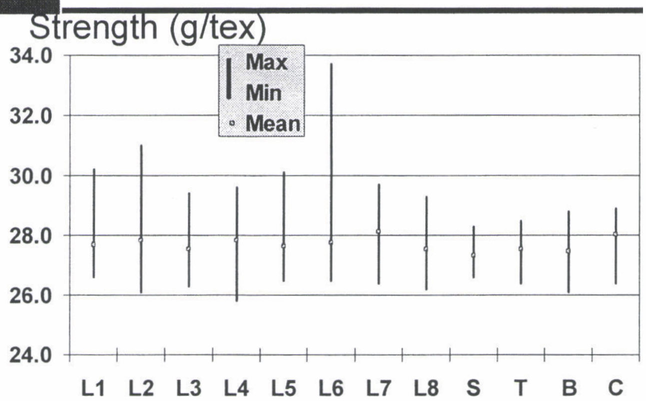
L= Layers 1 to 8 ; S= Strip sampler ; T= Top ; B= Bottom ; C= Cut sample

Results : Origin C, bale 4



L= Layers 1 to 8 ; S= Strip sampler ; T= Top ; B= Bottom ; C= Cut sample

Results : Origin A, bale 5



L= Layers 1 to 8 ; S= Strip sampler ; T= Top ; B= Bottom ; C= Cut sample

Statistical model

Variance components model

Y = mean
+ layer effect
+ column effect
+ error

All effects are independant

Statistical results

Main result 1

Within the same bale, the variance components are the same for every kind of sample

=> The sampling variance depends only on the number of layers, columns and measurements

Statistical results

Sampling error with *p* layers, *q* columns/layer and *r* measurements overall

$\sigma^2_s = \sigma^2_{Layer} / p + \sigma^2_{Column} / pq + \sigma^2_{Error} / r$

Example: double-sided cut sample

$\sigma^2_s = \sigma^2_{Layer} / 2 + \sigma^2_{Column} / 2 + \sigma^2_{Error} / 2$

Example: double strip sample

$\sigma^2_s = \sigma^2_{Column} / 2 + \sigma^2_{Error} / 2$

Statistical results

Main result 2 : The variance components depend on the origin of the coton, and the error component is dominant

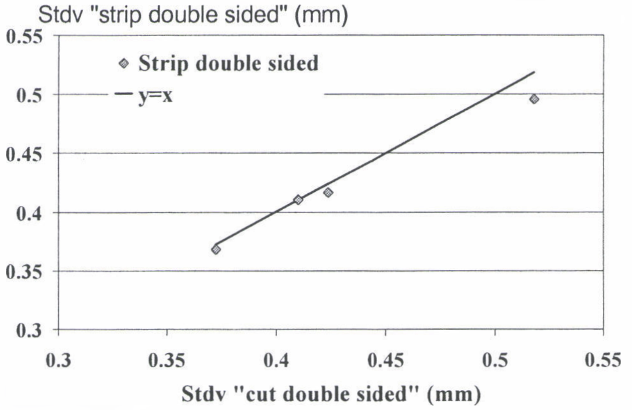
UHML	σ_{Layer}	σ_{Column}	σ_{Error}
Origin 1	0.11	0.03	0.59
Origin 2	0.00	0.18	0.55
Origin 3	0.08	0.11	0.51
Origin 4	0.21	0.16	0.68

Statistical results

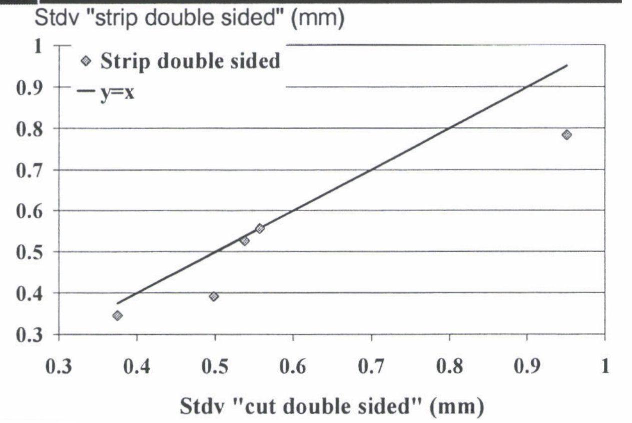
Main result 2 (continued) : for origin 4, the variance components even depend on the bale considered

UHML origin 4	σ_{Layer}	σ_{Column}	σ_{Error}
Bale 1	0.00	0.24	0.80
Bale 2	0.21	0.06	0.49
Bale 3	0.15	0.12	0.74
Bale 4	0.44	0.00	0.55
Bale 6	0.00	0.13	0.78

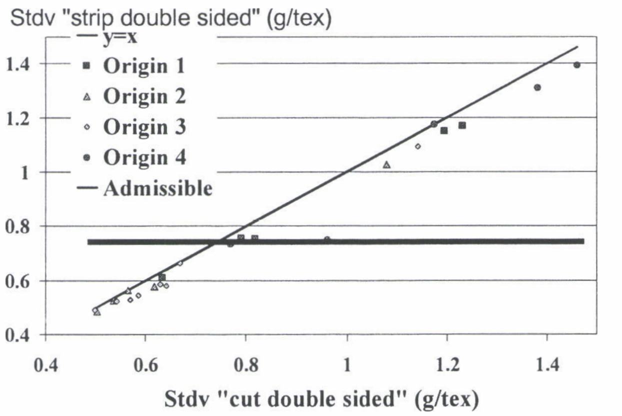
Standard error for UHML - 4 origins admissible = 0.25 mm



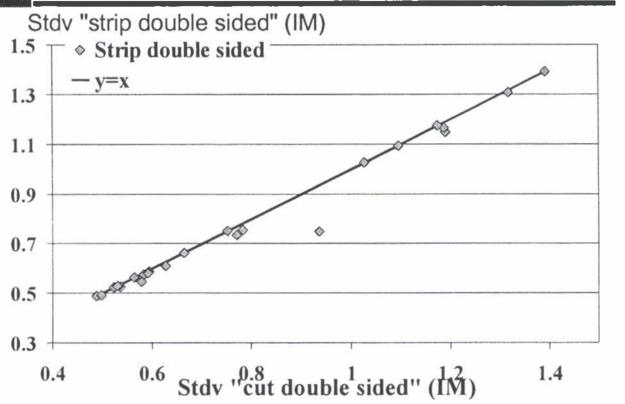
Standard error of UHML for the 5 bales of origin 4



Standard deviations for strength 4 origins, 24 bales



Standard error of micronaire 4 origins, 24 bales- acceptable=0.05



Outline of presentation

- Introduction and objectives
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- Conclusion

Conclusion

- The precision of standard samples is not always acceptable
- The strip sampler does improve the precision on a few number of bales only
- Still, the strip sampler is interesting for H2SD measurements, as stickiness seems to be not as evenly distributed as UHML, strength and IM

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Thanks for your attention

The H2SD : inter-laboratory test results

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Abstract

This study involves three High Speed Stickiness Detectors (H2SD) located in three different laboratories. The goal is first, to determine between-measurement variability for each of these devices and second to compare the mean count in each device with the others.

Fifteen cottons covering a wide range of 1 to 60 sticky spots were mixed twice using a laboratory opener, and were then dispatched to the laboratories. Each laboratory made 10 measurements with its H2SD on the 15 cottons following a randomized block design. The entire measurement procedure was replicated twice.

The square of the number of sticky spots was analyzed using a mixed linear model, with fixed laboratory and long-term time effects, and random short-term time effects. The residual variability within the laboratories was approximately the same for all three. Some short term or longer term drift was observed, depending on the laboratory.

Significant differences were observed between the laboratories, though the correlation between the results was very high (R^2=0.96, 0.97 or 0.99). The usefulness of a calibration is discussed.

Introduction

Six H2SD instruments are now in use in different continents to measure the stickiness of cotton. It is important to verify for commercial as well as for research use, that these different machines yield similar results.

For any given instrument, different measurements repeated on the same material do not yield exactly the same results: some variations are expected from one measurement to another. Further, the more the conditions vary, the greater the expected margin of error. Two notions are commonly used to characterize the quality of an instrument:

Repeatability: the degree of agreement between mutually independent test results produced by the same analyst using the same test method and equipment on random aliquots of the same sample within a short period of time.

Reproducibility: the extent to which a method, test or experiment yields the same or similar results when performed on subsamples of the same sample by different analysts or laboratories. (EPA, 2005)

Other ground is located between these two extreme notions, e.g. measurements made several months apart by the same analyst in the same laboratory. The aim of this inter-laboratory trial (or round test) is to estimate the margin of error for H2SD measurements made in the same laboratory and the variations from one laboratory to another.

Materials and methods

Experimental design

A set of 15 cottons, covering a range of stickiness from 1 to 60 H2SD sticky spots, were selected from different continents. In accordance with a previous homogeneity study of H2SD counts (Gozé *et al*, 2002), a 900 g sample of each cotton was thoroughly mixed twice using laboratory opener. It was then divided into 3 subsets. At the beginning of each of two measurement sessions, one subset was again divided into 5 to be sent to 5 different laboratories.

In each laboratory, each cotton was tested 10 times on the H2SD. Measurement order was randomized according to a complete block design to control short-term drift effects.

The entire measurement run was replicated two times in each laboratory. The second session was separated from the first by 4 months to estimate the longer term drift effect.

Statistical analysis

As H2SD results are counts, their variance increases with the mean stickiness of the cotton. This precludes the use of such notions as repeatability or reproducibility on raw data.

However, the study of the variability of H2SD counts within cotton bales (Gozé et al, 2002) has shown that, after a cotton has been mixed twice, the variance of the counts in that cotton is proportional to their mean. It can therefore been stabilized by a square root transform. The notions of repeatability and reproducibility are then valid for the square root of the counts. For an experiment such as this, with several factors, a log-linear model would be best, but a more classical linear model is in fact used on the square root of the counts, for the sake of simplicity.

A linear model was constructed by adding together the five possible sources of variations and some interactions:

$$Y_{ij} = a_i + b_j + (ab)_{ij} + c_{jk} + (ac)_{ijk} + D_{jkl}$$

with the following effects:

cotton	a_i
laboratory	b_j
session	c_{jk}
block	D_{jkl}
successive measurements made on the same cotton	E_{ijkl}

(ab) is the interaction between cotton and laboratory, (ac) between cotton and session.

As the session effect was not necessarily the same in different laboratories under different climates, the session effect was nested into the laboratory effect. Likewise, the block effect was nested into the session and laboratory effects.

Repeatability was evaluated by the variance of the measurement error (E). Reproducibility is the variance of the sum of all the environmental effects (laboratory, block and session) plus the variance of the measurement error. It should then be evaluated with all the environmental effects considered as random.

However insufficient laboratories and sessions were involved to determine a laboratory or session variance with precision. Therefore fixed laboratory and session effects were determined and a Fisher-Snedecor test was performed to check whether they were significant or not.

Sufficient blocks were used overall to determine the variance of the block effect D and repeatability E.

This addition of fixed long-term effects and random short-term effects built a linear mixed model. The calculations were made using the restricted maximum likelihood criterion, and the mixed procedure of the Sas® System, version 8.2.

Results

The results were initially analyzed separately for each laboratory. They were then analyzed together.

Within laboratory results

Of the five labs, only three maintained temperature and humidity conditions suitable for reliable results. The results of the remaining two laboratories were discarded.

Fisher-Snedecor tests for the session effect and for cotton x session interaction are presented in Table 1.

Laboratory		*1*	*2*	*3*
Session effect	F value	F=0.05	**F=8.18**	F=0.09
	P-value	P=0.83	**P=0.01**	P=0.77
	Estimation of the effect	-0.05 ± 0.24	**0.24 ± 0.09**	-0.03 ± 0.11
Cotton x session interaction	F value	F=1.48	F=1.03	F=0.58
	P-value	P=0.12	P=0.42	P=0.88

Table 1: tests for session effect and its interaction with the cotton effect.

The session effect was significant in the second laboratory only, at the 1% level. The square root of the H2SD count was shifted by 0.24 from the first session to the second.

On the original scale, using the identity $(A+B)^2 = A^2 + 2AB + B^2$, an original count of X spots was shifted by approximately 2 * 0.24 * the square root of X. For example, a mean count of 10 in the first session was shifted to 11.60 on average in laboratory 2. The session effect was not significant in the other laboratories.

The variances of the block effect and repeatability are shown in table 2.

Laboratory	*1*	*2*	*3*
Block effect	0.22	0	0.02
Residual =repeatability	0.81	0.55	0.52
Residual, with 6 outliers removed	0.62	0.55	0.52

Table 2: estimated variances for the block and residual effects for each laboratory

A block effect was visible in the first laboratory but was negligible in laboratories 2 and 3. Likewise, the residual variance was a little higher in the first laboratory than in the other two. A rapid examination of the residuals showed 6 outliers out of 897 points. The removal of these outliers lowered the residual variance, bringing it closer to those of the other laboratories.

None of the other variances was noticeably affected by the removal of the 6 outliers. As no explanation was found for these (plausible) misrecordings, we kept all the data for the subsequent results.

Inter-laboratory results

F tests for cotton, lab and interaction are shown in table 3.

Effect	*F*	*Num df*	*Den df*	*P>F*
Cotton	504.36	14	747	<.0001
Lab	30.05	2	54	<.0001
Lab x Cotton	2.60	28	747	<.0001

Table 3: tests for the effects of cotton, laboratory and their interaction

The laboratory x cotton interaction was significant, thereby indicating a laboratory effect which varies from one cotton to another.

Figure 1 shows for each laboratory the value obtained for each cotton in that laboratory plotted against the average of the three values obtained for the same cotton in the three laboratories. This graphic description shows that laboratory 1 is generally located between the two others, or, depending in the cotton, nearer to laboratory 3. The three laboratories tended to yield more similar results as stickiness increased to very high levels, i.e. above 50 sticky spots.

The tests and the plot show a need for recalibration: either the machines should be adjusted or the results have to be corrected. As an example, calibration equations were computed for laboratories 2 and 3, taking laboratory 1 as a reference.

lab#2 = 0.6413 + 0.9142 lab#1 R^2=0.96
lab#3 = 0.6216 + 0.9684 lab#1 R^2=0.99

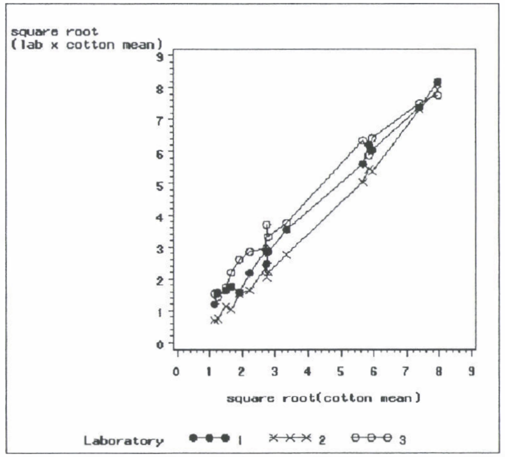

Figure 1: cotton mean for each laboratory plotted against cotton mean over for all laboratories.

Discussion and conclusion

Short-term variability

The short-term variability in 2 laboratories (#2 and #3) was the same as that observed in the within-bale variability study of 2002 (Gozé *et al*, 2002): the residual variance of the square root of the counts was about 0.5. The residual variance in the other laboratory (#1) was higher and superimposed with a block effect: this shows a greater short-term variability.

Longer term variability

One of the three laboratories showed some long-term variability, possibly due to the aging of some components, e.g. lamps or cleaner.

The cotton x session interaction was not significant in any laboratory, meaning that the shift due to the long-time effect, if any, was additive on the square root scale. Hence it can be corrected by calibration.

Discrepancies between laboratories

This round test showed some significant differences between the laboratories. In order to eliminate these discrepancies, either the H2SD can be hardware tuned, or the results can be software calibrated.

The H2SD can be tuned by different means: light intensity, lamp incidence angle, rotary cleaner settings. However a hardware calibration takes some time and is not usually conducted very often, e.g. once a year. Some improvements are about to be made to prevent some of the drifting caused by the aging of instrument components.

Software calibration may still be needed to compensate for the remaining shorter term drifts. Such a calibration has not until now been contemplated because of the good correlation between the results of the different devices, and because it is difficult for a user to admit that after making the necessary corrections, his cotton shows a non-integer number of sticky spots (e.g. 8.56 sticky spots).

Conclusion

We recommend that all H2SD should be tuned using reference cottons so that all yield the same results on average. Check tests should then be conducted on a regular basis to verify that this homogeneity holds. A software calibration should be made possible to compensate any residual drift between the tunings.

Acknowledgements

We wish to thank all the laboratories who participated in this round test. We are particularly grateful to Cotton Inc. (USA) for supporting this project.

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H2SD ROUND TEST
Inter-laboratory results

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Outline

- Introduction
- Material and methods
- Results
- Discussion and conclusion

Introduction

- 6 H2SD are now used in different continents
- For commercial use one has to verify that different machines yield similar results

Introduction

- In fact different measurements made on the same cotton never yield *exactly* the same results : one can expect some variations from one measurement to another
- The error margin is expected to go wider as the measurement conditions vary more.

Introduction

Two extreme variability measurements are

- repeatability : variance between measurements made in the same lab, by the same operator and nearly at the same time
- reproducibility : variance between measurements made any time by different operators in different laboratories.

Introduction

- The goal of this interlaboratory trial (or round test) is to estimate the error margin of the H2SD measurements within the same lab and also the variations from one lab to another.

- Introduction
- **Material and methods**
- Results
- Discussion and conclusion

Experimental design

- Set of 15 cottons, covering a range of stickiness from 1 to 60 H2SD sticky spots.
- Each cotton was thoroughly mixed two times with a card, and sent to 5 different laboratories

Experimental design (cont.)

- In each lab, each cotton was tested 10 times with H2SD. The measurement order was randomized according to a complete **block** design to control the short term drift effects.
- The whole measurement scheme was replicated two times within each lab. The second **campaign** was separated from the first one by a 4 months interval, to estimate a longer term drift effect.

- Introduction
- Material and methods
- **Results**
- Discussion and conclusion

Statistical analysis

- Results are square root transformed
- Five sources of variations :
  - Between cottons a_i
  - Between laboratories b_j
  - Between campaigns c_{jk}
  - Between blocks D_{jkl}
  - Between successive measurements made on the same cotton E_{ijkl}

Within labs results : tests

Laboratory	1	2	3
Campaign effect	F=0.05 (P=0,83)	**F=8.18 (P=0.01)** Magnitude = 0.24	F=0.09 (P=0.77)
Cotton x campaign interaction	F=1.48 (P=0.12)	F=1.03 (P=0.42)	F=0.58 (P=0.88)

Statistical analysis (cont.)

- The variances of all these random effects add up to the reproducibility variance
- The lab and campaign *effects* can be estimated and tested. But they are too few for a *variance* of these effects to be estimated precisely : these effects are considered **fixed**.

Within labs results : variances

Laboratory	1	2	3
Block effect	**0.22**	0	0.02
Residual =repeatability	**0.81**	0.55	0.52
Residual, with 6 outliers removed	0.62	0.55	0.52

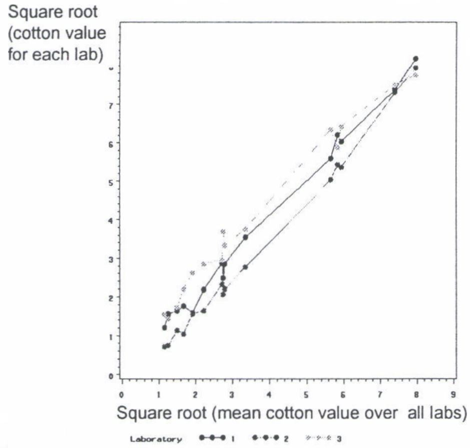
Statistical analysis (cont.)

- On the other hand, the blocks and repeatability *variances* can be estimated with a satisfactory precision.
- This addition of fixed long term effects and random short term effects makes a linear mixed model
- The calculations were made with the Sas® System

Inter-lab results

Effect	F	Num df	Den df	P>F
Cotton	504.36	14	747	**<.0001**
Lab	30.05	2	54	**<.0001**
Lab x Cotton	2.60	28	747	**<.0001**

Description of the lab x cotton interaction



Discussion: longer term variability

- One of the three labs showed some long term variability : it may be due to the aging of some components : lamps, cleaner e.g.

A possible recalibration

Reference = lab #1

- Calibration equation for lab #2

lab#2 = 0.6413 + 0.9142 lab#1 R^2=0.96

- Calibration equation for lab #3

lab#3 = 0.6216 + 0.9684 lab#1 R^2=0.99

Discussion

The H2SD can be tuned by different means :

- light intensity, incidence angle of the lamp, rotative cleaner settings; ... : hardware calibration
- calibration by a regression software

- Introduction
- Material and methods
- Results
- **Discussion and conclusion**

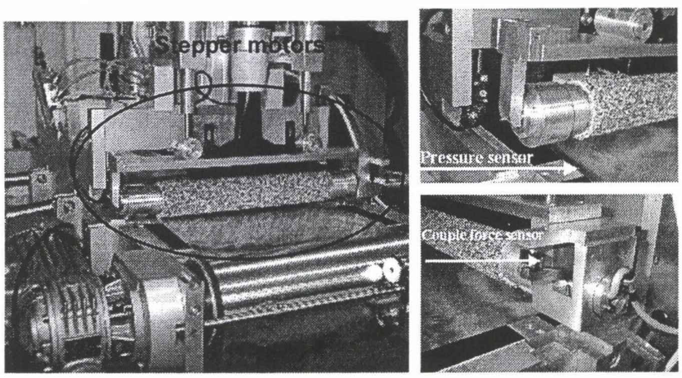
Discussion

- The hardware calibration takes some time and is usually not made very often (once a year ?)
- Some improvements are about to be achieved to prevent some of the drifts due to the aging of the instrument components

Discussion: short term variability

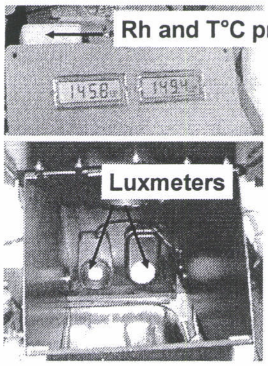
- For two of the 3 labs (#2 and #3) the short term variability is the same as that observed on the within-bale variability study of 2002 : the residual variance of the square root of the counts is about 0.5
- For the remaining lab (#1), the residual variance is higher and superimposed with a block effect : this shows a higher short term variability

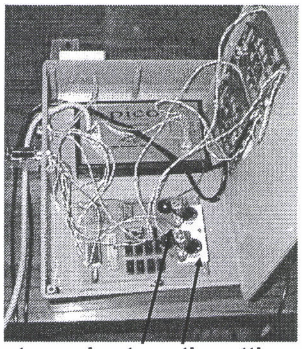
Cleaner : Instrumented adjustment



Aluminum foil illumination

Measurements and ...





... toward automatic settings ?

Discussion

- A calibration by a software may still be needed to compensate the remaining shorter term drifts

Conclusion

- A calibration by software was not contemplated until now, due to the good correlation between the results of the different machines...
- ... and because it will be difficult for the user to admit that after the necessary corrections, his cotton shows, a non-integer number of sticky spots (e.g. 8.56 sticky spots).

Acknowledgements

- We wish to thank all the laboratories who participated in this round test
- We are particularly grateful to Cotton Inc. (USA) for supporting this project

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