Gérard Gawrysiak gérard.gawrysiak@cirad.fr CIRAD, IRU Quality in Cotton Production 73 rue Jean-François Breton, TA 70/16, 34398 Montpellier Cedex 5 France

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## Cottonseed technology

Cottonseeds have a high cellulose, protein and lipid content and many dietary and industrial uses. The main coproducts are cellulose derivatives, edible oil for human consumption and seedcake for livestock feed. CIRAD is focusing research on proteins extracted from crushed cottonseed to assess their food and film-forming properties.

Ginning mill, Cameroon. Vacuum pickup of seed cotton. © G. Gawrysiak



# Cotton technology—Quality at every stage

Cotton has been utilized by humans for over 8 000 years and was the first textile crop. Comprehensive knowledge on the intrinsic properties of cotton fibre has secured the success of today's cotton lint and yarn trade. The CIRAD Cotton Technology Laboratory is conducting research on cotton product (seed cotton, cottonseed and fibre) quality criteria, and is investigating all possible ways of effectively promoting this quality, through classification and standardization systems and innovative uses or devices.

## The CIRAD Cotton Technology Laboratory

The CIRAD Cotton Technology Laboratory studies relationships between the technological traits of cotton fibre and yarn, the impact of air conditioned rooms, the effects of trash, the features of devices from different manufacturers, the behaviour of cotton blends, cotton-silk blends, etc. The laboratory provides support for agronomic and genetic studies under way in developing countries to choose varieties on the basis of final lint quality and market demand. It also assists molecular biologists in locating genetic markers for fibre quality. In conjunction with its high involvement in dealing with cotton lint contamination, the laboratory also files patents, develops devices and markets them after the technology is transferred to local companies. The laboratory is promoting cotton quality, especially by developing and updating measurement methods and operating procedures. It offers training courses, such as that held in Benin in 2005 to benefit the eight cotton producing countries of the West African Economic and Monetary Union. The laboratory regularly conducts laboratory appraisals and audits worldwide.

### Ginning

Seed cotton ginning involves separating fibre from cottonseed using saw or roll gins. The CIRAD Cotton Technology Laboratory has gained solid experience in maintaining fibre quality during and after ginning, as well as calibrating and operating small-scale gins for the purpose of assessing industrial units and processing tiny quantities of seed cotton, particularly for breeders to select new varieties.

Automated device for measuring fibre characteristics. © CIRAD

#### **Fibre characteristics**

It is essential to gain insight into the technological traits of cotton fibre, including length, length uniformity, strength, colour, fineness and maturity. This data is used to guarantee that the product meets the high commercial trade standards. These features must be evaluated under specific conditions because some may be altered by temperature and humidity. Fibre analyses are thus performed with instruments set up in air-conditioned rooms in compliance with international standards. Reference standards are also required to calibrate the analytical instruments.

The CIRAD Cotton Technology Laboratory is one of the six laboratories in the world involved in a programme to assess cotton reference standards used to calibrate all measurement devices worldwide that are marketed by USDA in the United States.

#### Yarn processing

The CIRAD Cotton Technology Laboratory has a micro-spinning mill, consisting of a mini-card, a drawing frame and ring and open-end spinning machines to perform small-scale assessments of common textile processing operations. This equipment is used to test fibre performance during the spinning process. The laboratory is also equipped with special instruments for measuring yarn quality (tensile strength, elongation, evenness, defects and trash content). The test results are useful for selecting cotton varieties that meet growers' and manufacturers' needs.



Micro-spinning mill in the CIRAD Cotton Technology Laboratory. © R. Frydrych

#### For further information

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#### **Partners**

West and Central Africa: IRAD, Institut de recherche agricole pour le développement; SODE-COTON, Société de développement du coton, Cameroon SONAPRA, Société nationale pour la promotion agricole; PARCOB, Projet d'appui à la recherche coton du Bénin, Benin • SOTOCO, Société togolaise du coton; IRCT, Institut de recherche coton du Togo, Togo • CNRA, Centre national de la recherche agronomique, Côte d'Ivoire · SOFITEX, Société des fibres textiles, Burkina Faso • SODEFITEX, Société de développement et des fibres textiles, Senegal COTONCHAD, Société cotonnière du Tchad, Chad

South America: COODETEC; COAGEL; UNICOTTON, Brazil • IAN, Instituto agricol nacionale; INTN, Instituto Nacional de Tecnologia y Normalizacion, Paraguay

USA: USDA, United States Department for Agriculture • ITC, International Textile Center, Texas • Cotton Incorporated • CFC, Common Fund for Commodities

Europe: ENSITM, Ecole nationale supérieure des industries textiles de Mulhouse; UHA, Université de Haute Alsace; Groupe Dagris and subsidiaries (SOSEA, COPACO); AFCOT, Association française cotonnière; COTIMES; SYDEL, France • Bremer Institut, Germany • Uster Zellweger; Dunavant Sa; Reinhart Sa, Switzerland

Madagascar: COTONA company

**Vietnam:** Central For Cotton Fiber Testing and Seed Technology



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