



74th Plenary Meeting of the INTERNATIONAL COTTON ADVISORY COMMITTEE

MINUTES SECOND BREAKOUT SESSION Cotton By-Products and Their Uses

09:00 hr. Tuesday, December 8, 2015
Chair: Mr. Suresh Kotak, Kotak & Co. Ltd., India

Speakers:

Dr. Amal Saber Owis, Former Director, Cotton Research Institute, Egypt, "Recycling of Cotton Stalks to Economic Products."

Dr. P.G. Patil, Director, Central Institute for Research on Cotton Technology (CIRCOT), India, "Cotton By-Products and their Uses."

Dr. Greg Holt, Research Leader, Cotton Production and Processing Unit, USDA/ARS, USA, "Cotton By-Products: Possibilities and Potential."

"COTTON' Can Spell "Prosperity"

Cotton fiber represents only about one-seventh of the biomass of the cotton plant by weight, and cotton seed represents about one-fifth. Together, fiber and seed represent only about one-third of the total biomass production of cotton plants, and yet traditionally only the fiber and seed have been considered to be of economic value. Worldwide, approximately 100 million tons of cotton plant material, consisting of stalks, seed, fiber and material separated from lint and seed in the ginning process, are essentially wasted or underutilized each year. However, this material has great economic potential if properly utilized and could contribute to the economic impact of cotton production.

Panel members reported on research in Egypt, India and the USA that demonstrates that more than 1,000 industrial products can be manufactured from cotton stalks, cotton seed, and the biomass recovered from the ginning process (often called "gin waste" or "gin trash" and consisting of leaf parts, sticks, carpal and lint). Segregation of biomass between stalks, leaf, sticks, carpal and lint, is a critical step in developing economically viable applications. Ironically, this material is already segregated during the ginning process but is usually recombined for ease of disposal by ginnery operators. In developing alternative uses of cotton biomass, ginnery operators will need to maintain the segregation of different materials.

Cotton stalks can be used to produce organic fertilizer, animal feed, wood products, various cellulose applications, and as charcoal for fuel and filters. Cotton seed can be used in the production of linters, cooking oil, meal for animal feed, fertilizer and other uses. Cotton seed oil is the third largest vegetable oil in India and can be utilized as cooking oil, salad dressing, soap and cosmetics. The underutilization of cotton seed oil represents a loss in value of approximately US\$1 billion per year in India alone. Biomass recovered from the ginning process can be used to produce animal feed, composite building and packaging material, and geotextile products. Packaging material produced from cotton gin biomass can be used as a substitute for Styrofoam in applications where single use, biodegradable material is desirable, thus reducing pollution. Geotextile products include mulch used in erosion control and sponges used to absorb oil and other liquid contaminants resulting from spills. There are already thirty factories in India producing particle board from cotton stalks utilizing technology pioneered under a project funded by the Common Fund for Commodities (CFC) and supervised by the ICAC.

There is a broad consensus that the full economic potential of cotton stalks and material produced in the ginning process is not being realized. Cotton producers and researchers must look at the whole plant and its components as economic assets, not just the lint and seed. Cotton by-products are often best used in blends with other natural fiber components to produce products with superior performance characteristics. In considering potential uses of

cotton plant biomass, researchers should draw inspiration or try to mimic natural processes and products (bioinspiration or biomimicry), and the world cotton industry needs to consider non-traditional uses of plant material. The cotton industry must work to sensitize industrialists to the potential uses of cotton plant material, but there is ample evidence that bio-applications of cotton biomass are already needed, wanted and used in the world economy. If fully utilized, cotton fiber, seed, stalks and ginning biomass can contribute to income generation and environmentally responsible industrial products. "Cotton" can spell "Prosperity."