

Cotton Traceability Through the Supply Chain

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Dr. Mohamed Negm

Dr. Negm has collaborated with leading international consulting compa-

Prof. Dr. Mohamed Negm is a distinguished researcher at the Cotton

Research Institute in Giza, Egypt,

with extensive expertise in cotton improvement programs. Since 1992,

he has made significant contribu-

tions to research in fiber breeding,

ginning, fiber technology, and spinning. His work has played a crucial

role in advancing cotton research and

production, both nationally and in-

nies, providing expertise in cotton ginning and spinning across multiple countries. His contributions have been widely recognized, earning him prestigious national awards. In 2005, he received the Nation's Encouragement Award in Advanced Scientific Technology, the highest honor for scientific researchers in Egypt, awarded by the Ministry of Scientific Research and Technology. More recently, in 2023, he was honored with the Nation's Pioneers Award in Agricultural Science for his outstanding contributions to agricultural research.

ternationally.

On the international stage, Dr. Negm has held key leadership positions, including serving as Chairman of the International Cotton Researchers Association (ICRA) under ICAC in 2021. His expertise in cotton processing continues to benefit global cotton industries, making him a sought-after consultant in ginning and spinning technologies worldwide.

SUSTAINABLE DEVELOPMENT AND COTTON TRACEABILITY

Sustainability or sustainable development is defined as "economic and social development that meets the needs of the current generation without undermining the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987).

This definition merges economic, social, and ecological aspects under the umbrella of sustainability and is extensively referenced in the literature.

Retail brands employ various techniques to convey sustainability information to consumers, including third-party certification, special logos, and traceability information.

METHODS OF FIBER TO FABRICS TRACEABILITY

Traceability from fiber to fabrics can be achieved through primarily four methods, supplemented by an E-document platform, which can either accompany these methods or serve as a standalone approach.

- 1. DNA BioMarker for Cotton Traceability
- 2. FibreTrace Technology for Textile Traceability
- 3. Innate DNA Testing for Cotton Traceability
- 4. Isotope Analysis for Cotton Traceability
- 5. E-Documents in Modern Business Transactions

DNA BIOMARKER FOR COTTON TRACEABILITY

Cotton fibers can be tagged with unique DNA marks at the very early stages of the manufacturing process, specifically during ginning. Products crafted from these marked fibers can later be authenticated by forensically identifying the presence of these DNA marks, which are trademarked as Bio-Marker. These Bio-Marker marks originate from botanical DNAs that have been modified and stabilized to endure the harsh treatments typically encountered throughout the cotton manufacturing process. Moreover, Bio-Marker is designed to permanently bond with any cellulosic fiber, providing robust forensic capabilities and protection for a broad range of applications. This technology enhances brand protection efforts and strengthens supply chain security by enabling products to be traced back to their original source of manufacture. DNA Bio-Markers can be applied at any point along the textile supply chain, including on raw cotton fiber, thread, yarn, woven labels, and finished garments.

Advantages of DNA BioMarker:

- Provides origin, allowing for traceability back to the point of fiber production.
- Offers identification, enabling differentiation between fibers.
- Ensures authentication, helping to verify the legitimacy of the final product.

Disadvantages of DNA BioMarker:

• It is a costly method, potentially limiting its widespread