Revolutionizing Cotton from Dx to Rx: curing cotton supply chains

Presented by Jo Greenwood, Ph.D.
Technical Director, EMEA
Applied DNA Sciences, Inc.

"Dx: Diagnostic" - fiberTyping®

- "diagnostic" system that includes DNA extraction, testing and analytical reporting of cotton-based products; in fiber, yarn, fabric and finished goods.

Programmed Cell Death in Cotton Destroys
Nuclear DNA After Flowering

- No nuclear DNA remains due to digestion by nuclear enzymes after cell death
- Nuclear DNA destruction continues until no DNA remains
- Cotton is picked ≥ 50 days after flowering
- Analysis of the species of origin must be done hundreds or thousands of miles later
- Nuclear DNA is not available in commercial cotton

Mining the Cotton Chloroplast Genome

APDN scientists analyzed cotton chloroplast genomes to identify regions most likely to differ between cultivars (the DNA that is not highly conserved by evolution).

The ADNAS Discovery

Biggest discovery of all. Cotton fiber lineage is preserved in finished Pima cotton textiles.

Patented DNA Genotyping Test

- ELS
- Upland

Dx Market Tests Show 89% Non-Compliant products!

89% of all sheeting surveyed is non-compliant.

“Rx: Therapeutic” - SigNature™

- "therapeutic" system that provides traceability and proof-of-origin, and identity for product claims (e.g., organic, sustainably grown, grown in Egypt).

SigNature™ Stays Bound

Raw ELS cotton was placed on conveyor belt and sprayed with SigNature™ T during the hydration step in the ginning process. After baling, samples were randomly selected to assess marking efficiency. SigNature™ T was consistently recovered from multiple, individual cotton fibers.

SigNature T Survives Textile Processes

Patented rapid tests yield forensic proof of DNA in 11 minutes.

Applied DNA Sciences and USDA have a contractual collaboration to genotype and discriminate >70 global cultivars of cotton.

Rx Proof: SigNature T Secures Supply Chains from Fiber to Finished Goods

- Over 100 million lbs of cotton tagged since 2014.
- Commercially used by brands, retailers, manufacturers, merchants and growers to ensure cotton supply chains are pure.
- DNA-clarified supply chains deliver 100% of the intended product.
- DNA-verified finished goods outperform the competition.