

Objective

The Product Development and Implementation division at Cotton Incorporated invites innovative research proposals addressing the following strategic initiatives. As an organization committed to expanding cotton utilization across consumer markets, Cotton Incorporated prioritizes applied research with clear pathways to real-life implementation. Our funding strategy emphasizes projects demonstrating rapid translation potential from laboratory development to production integration, with particular interest in solutions that enhance cotton's competitive positioning in both traditional and emerging applications.

The topics of interest are as follows:

- 1. Develop advanced cotton-reinforced *composite material* for high-value applications in construction, automotive, or aerospace sectors that are designed with biodegradability in mind.
 - a. The comprehensive project scope encompasses composite material development, testing, and documentation under simulated use conditions.
 - b. Perform techno-economic analysis to assess commercial viability and environmental sustainability.
- 2. Develop cotton fiber-reinforced *compression molded* products for furniture, agricultural, or other industrial applications.
 - a. Design materials that meet performance standards for targeted end-uses.
 - b. Characterize properties, optimize molding parameters, and validate through application testing.
 - c. Assess production scalability and market viability through techno-economic analysis.
- 3. Develop cotton-based *biodegradable packaging* for food packaging and/or single-use plastics replacement with optimized mechanical properties.
 - a. Balance performance requirements with environmental compatibility.
 - b. Characterize materials and validate application performance.
 - c. Measure biodegradation rates across environmental conditions to confirm sustainability claims.
- 4. Create innovative biodegradable non-apparel products from *recycled cotton* for applications in home textiles, industrial segments, or sustainable packaging.

- a. Characterize materials, optimize processing, and validate performance.
- b. Measure biodegradation rates across environmental conditions to confirm sustainability claims.
- 5. Develop high-performance cotton-based *filtration media* for water or air purification.
 - a. Optimize structure and treatments for improved efficiency, longevity, and reduced pressure drop.
 - b. Characterize performance across diverse contaminants and operating conditions.
 - c. Analyze production costs, scalability, competitive advantages, and market positioning.
- Develop commercial applications for the highly crystalline residual cellulose obtained from the cotton-to-sugar hydrolysis process (as a by-product obtained from a project managed by Cotton Incorporated).
 - a. Explore integration of the cellulose into composites, paper packaging, or novel application areas.
 - b. Characterize material properties and optimize processing for target applications.
 - c. Evaluate performance benchmarks and commercial viability in selected markets.
- Create value-added applications for glucose derived from the cotton-to-sugar hydrolysis process (project managed by Cotton Incorporated).
 - a. Focus on bioplastics, biochemicals, or other innovative product categories.
 - b. Develop conversion processes optimized for cotton-derived glucose feedstock.
 - c. Demonstrate technical feasibility and commercial potential in target markets.
- 8. Develop a novel chemical application leveraging cottonseed oil's high level of unsaturated reactive groups.
 - a. Target high-value formulations for surfactants, emulsifiers, lubricants, green solvents, plasticizers, or other innovative product categories.
 - b. Optimize synthesis pathways for industrial-scale production.
 - c. Validate performance characteristics for specific industry applications.

Priority consideration will be given to targeted research initiatives with well-defined scope parameters, specifically those structured to deliver demonstrable preliminary outcomes within a **6– 12-month timeframe**. All research activities must reach completion by December 2026, with comprehensive final deliverables submitted according to established reporting protocols. Projects

showing exceptional promise may qualify for extended funding for the following year.

Background

Cotton Incorporated's mission focuses on driving sustainable growth in cotton demand while enhancing producer profitability throughout the industry ecosystem. Our funding decisions favor proposals with well-articulated commercial applications and measurable market impact potential. Prospective applicants should consult our company website (<u>www.cottoninc.com</u>) to gain comprehensive insight into Cotton Incorporated.

Pre-Proposals

Researchers are urged to submit a concise pre-proposal before developing full documentation. This initial submission, which includes a brief email outlining the concept, methodology, and *budget requirements*, facilitates collaborative refinement of objectives aligned with organizational priorities. Pre-proposals must specify the target research category and be limited to less than three per investigator.

Upon approval, candidates will receive an invitation to submit comprehensive proposals with sufficient preparation time allotted. All pre-proposals must be submitted electronically by **Monday**, **June 30**th, **2025**. Late submissions will not qualify for consideration in the 2026 funding cycle.

Pre-Proposal Submission

Submit all pre-proposals electronically no later than **Monday, June 30th, 2025**. Only pre-proposals that meet our strategic criteria will advance to the full proposal stage. Direct all pre-proposal submissions to:

Mary Ann Ankeny Vice President, PDI Operations Textile Chemistry Research, Cotton Incorporated 919.678.2394 TCR-Proposals@cottoninc.com