Plastic Contamination Detection and Removal from Seed Cotton

Mathew Pelletier, Greg Holt, John Wanjura – USDA-ARS, Lubbock, TX

78th ICAC Plenary Meeting
Brisbane, QLD, December 2-5, 2019
Contamination in Cotton

- Fabrics & Strings
  - Woven plastic
  - Plastic film
  - Jute
  - Cotton

- Oils/Chemicals
  - Grease
  - Oil
  - Tar

- Organic matter
  - Leaves
  - Feathers
  - Paper
  - Leather

- Inorganic matter
  - Sand/dust
  - Rust
  - Metal
Contamination
Some of the contamination mills find in their cotton
Problem

• Contamination in seed cotton often times leads to contamination in lint

• Contamination in lint increases cost of production to the end user and results in lost revenue to the seller/grower.

Solution

• Develop a system to detect and remove contamination from seed cotton prior to ginning.

• System should be adaptable to different types of ginning systems (saw or roller ginning)
Camera Detection System in Module Feeder – Two Commercial Gins

USDAERS
New Camera for Module Feeder
Camera Detection and Removal System over Feeder Apron – Commercial Cotton Gin
Plastic Sensor Lab Test Setup
Camera Housing Design with Cooling and Self-cleaning Optics
Gin Stand Feeder Apron provides Optimal location for detection-removal station in Cotton-Gins
Rapid System Troubleshooting and Verification
Plastic Detection-Ejection System Development Progress

Average Efficiency
Pink E.J. = 81% (latest – 92%)
Yellow E.J. = 79% (latest - same)

Early 2018 Testing
Late 2018 Testing
Some Issues Encountered

- Attaching system to feeder apron
- Type and size of contaminants
- Air supply to ejection and cooling systems
- Changes in flow of seed cotton to gin stand
- Dust buildup on background
- Verification and quality assurance checks.
Latest Update

- 2 Beta test sites for 2019-2020 Ginning Season– One in the Southern U.S., all gin stands retrofitted, and one in Texas, only one gin stand retrofitted.

- Velocity Measurement on feeder apron

- Moving detection system further upstream in the ginning process – adaptable to other ginning systems and configurations.
Thank You
Partial Funding by Cotton Inc.