COTTON & TOBACCO

C&T Continues to Implement Automation Systems, Improving Efficiencies with Cotton Instrument Testing

The Cotton & Tobacco Program (C&T) classes all U.S. cotton upon the request of producers or their designees who pay a user-fee for the service. C&T has a long history of investing in people, capital and equipment, and technological innovations capable of increasing operational and financial efficiencies and improving the quality of services to our stakeholders and customers. Consistent with this tradition, C&T has recently increased the use of automated conveyance systems in cotton classing facilities.

Samples from every bale of cotton produced in the U.S. are tested using electronic instrumentation, commonly known as High-Volume Instruments (HVI), followed by a visual inspection for extraneous matter by a human classer. The handling of cotton samples (loading and preparation of samples) and the conveyance of samples from one classing process to another while preserving each sample's identity has limited the operational inefficiencies of the HVI equipment and human classers. As of this crop year, four C&T facilities have been equipped with automation systems that reduce the amount of human intervention. These automated material-handling systems have proven capable of optimizing the operation of the HVI equipment and balancing the flow of samples among classers.

Cotton and Tobacco implemented its first automation system in its Abilene, TX cotton classing office during the 2015 crop. Abilene is an operation that classes approximately 16,000 samples per day. The automation system increased the efficiency of the operation, reducing the number of costly HVIs required from 12 to 8 (one-third reduction) and increasing the number of samples tested on each HVI from approximately 90 per hour to 140 per hour (55% increase). Tasks performed by instrument operators were also streamlined, eliminating the handling of large trays of samples and reducing fatigue.

In 2017, C&T introduced automation systems in its Lubbock, TX and Memphis, TN cotton classing offices. In Lubbock, systems installed in its lab reduced the number of HVIs required from 36 to 24 (one-third reduction) to class the office's 40,000-50,000 samples per day. With the automation systems, HVI production increased from approximately 90 samples per hour to 135 (50% increase). With the new Memphis, TN systems, C&T introduced a new concept with the design and installation, that fully automated the testing of the fiber measurements of micronaire, length, length uniformity and strength with no human intervention. In this configuration, the instrument operators test the color and trash of each cotton sample and then load the sample and two sub-samples into an individual carrier that is delivered to a waiting HVI to be tested. A single system was installed in 2017 to test this new concept, and it successfully tested over 500,000 samples. To class these 500,000 samples, four fewer HVIs and 40 percent fewer operators were utilized. In 2018, the system tested over a million samples. A second system was added in 2019, allowing the Memphis office to reduce HVIs by another 4 machines and class a larger majority of the 50,000-60,000 samples received daily from its region.

In 2019, C&T's Rayville, LA classing office installed the latest version of the automation system. This new system allowed for 10 HVIs to replace 16 HVIs (more than one-third reduction) previously installed to class the approximately 9,000 samples per day and overall, 450,000 samples during the classing season.

Cotton and Tobacco will continue to improve upon the automation designs and install additional systems in the future to further improve its efficiency. The systems have allowed the Program to decrease its fleet of instruments and associated purchase/replacement and maintenance costs while not sacrificing accuracy or daily output of classing data to its customers.