QUALITY ASSURANCE PROCEDURES WITHIN A CLASSING OFFICE

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Abstract

Quality testing procedures are an integral part of Classing Office operations. This makes possible the accurate and precise assessment of fiber properties and the correct determination of color grades, leaf grades, and extraneous matter.

Introduction

The Cotton Division has three primary goals for its field office operations. We want to provide high quality fiber measurements and grade determinations; we want to run a cost efficient operation, making maximum use of available resources; and, since we're working with a commodity whose value can change rapidly over time, we want to class each sample as quickly as possible while still maintaining the quality of our classing.

Following is a brief overview of some of the procedures and processes we use at the classing office level to ensure that we meet our first goal, Quality.

Discussion

Training: Classers, HVI Operators, HVI Line Technicians, Supervisory Staff

We have a concentrated 14 week training school for classers at the end of which each classer has to demonstrate his classing proficiency by passing a practical examination. HVI operators are trained in line operations and then run dummy cotton until they demonstrate their ability to handle the samples and lines properly. All HVI Technicians must complete a two week in depth course on HVI line operations, maintenance, and repair. Classers and HVI operators get extensive supervision throughout the season from supervisors especially trained for this purpose.

Pre-Season Precision and Accuracy Tests

Prior to each season every HVI line must pass a Precision and Accuracy evaluation. Known value cotton is tested a multiple of times. All lines must demonstrate that they can reproduce the known values within tight tolerances and that they can do so with a low standard deviation. Lines are not put into production until they successfully complete this preseason precision and accuracy test.

Environmental Controls : Conditioning of Samples : RCUs

Because some fiber determinations are moisture sensitive (primarily strength, mike, and length), USDA labs and receiving rooms are maintained within ASTM standards for temperature (70 degrees F. +/- 1.0 degree) and humidity (65% relative humidity +/- 2%).

The cotton samples we test must fall within the range of 6.75% - 8.25% moisture. The samples we receive are often outside this moisture range and must be conditioned. In the past this meant we had to expose the samples in conditioned space for up to 48 hours to ensure that they had reached equilibrium within the prescribed moisture range. Today - in many of our offices - we use Rapid Conditioning Units (RCUs) to quickly condition samples for testing. The RCU is a chain conveyor over a plenum through which ambient conditioned air is fan pulled. Samples passed over this plenum can usually be conditioned withing 10 minutes.

Calibration : In-House Checks : Process Control Charting

HVI lines and micronaires are calibrated using known value cottons. The color heads and trash meters are calibrated using tiles. Classers Acalibrate@ themselves by reviewing and referring to the Universal Standards, grade boxes prepared annually to represent all physical grades and all leaf grades.

Using a combination of In-House Checks and Process Control Charting, calibration is verified at a minimum of every two hours. In-House Checks verify that the HVI line can reproduce the test results of known value cotton. Process Control Charting (PCC) utilizes statistical sampling techniques to determine whether or not the process is in Acontrol@. If either in-house or PCC checks indicate that the line is not testing correctly, the entire process is checked for error (e.g. sample conditioning, operator error, HVI malfunction) and, if none is found, the line is calibrated.

Average Reports

Frequently throughout the shift supervisors run Average Reports. The Average Report is a computer generated report that states the average by HVI line and the difference of the HVI line average from the office average for each fiber property measured. This report can be run for any time period. Since samples arrive at the HVI lines randomly, the Average Report is an effective method to determine quickly whether all lines are functioning at the same level.

Quality Assurance

Checklot samples are selected randomly throughout the shift. Samples are selected after they are HVI tested and after classer determinations are assigned. These samples are forwarded to the Cotton Program's Quality Assurance lab. Quality Assurance HVIs and classes these samples and reports daily back to the classing offices. This process

ensures that all offices are testing and classing cotton the same. As Quality Assurance data is reported by HVI line and classer, it also affords each office the opportunity to further evaluate the testing integrity of each line and the classing performance of each classer.

Employee Awareness

Finally, the most important asset in quality control is our employees' constant and continuous alertness to possible errors in testing. These people make it happen - not only in responding to check system alerts, but also in advocating changes to the processes that affect quality. Over the years their suggestions have been largely responsible for many improvements in HVI testing equipment and procedures.

Module Averaging

The Cotton Program is committed to providing accurate and reproducible fiber testing and classing services. There is one procedure, however, we don't initiate except at the request of the ginner or producer. This is a service we provide free of charge and that dramatically improves the reproducibility of HVI data. I am referring to Module Averaging. Module Averaging applies only to mike, length, strength, and uniformity. Each bale from the module (or trailer) is sampled and tested in the normal manner. The HVI data from all the module's/trailer's bales are averaged for mike, length, strength, and uniformity. These averages replace the individual bales' values. By in effect increasing the sample size and using multiple samples, module averaging removes the slop of a two-specimen test and moves the reproducibility of our testing data to a higher level.

Summary

By incorporating all these procedures into our testing/classing system and by encouraging all ginners and producers to participate in Module Averaging, we strive to provide the highest quality testing and classing services possible.