PRACTICAL USE OF ELECTRONIC TECHNOLOGIES TO TRACK MODULES: PANEL DISCUSSION SUMMARY

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Introduction

Most U.S. farmers and ginners still use paper tags to identify cotton modules along with the large number painted on the side of traditional modules. Tags for the modules are typically assigned by the gin. When the gin gets the module, the paper tag is removed and then the information is manually entered into a software program. With RFID technology already used in round modules, every module comes with a unique identifier and all of the data associated with the module can be transmitted or downloaded directly from the picker. Many Australian gins use this technology to manage a majority of their modules. Their adoption of this technology has been facilitated by the large size of their operation with in-house technical and computer support. As was demonstrated in the comments made during this panel discussion, there are some U.S. gins now using RFID tags to track modules, and it will likely benefit more U.S. gins in the future.

The panel was made up of four participants: Ed Barnes, Cotton Incorporated, Cary, NC; Christopher Murray, John Deere, Des Moines, IA; Jonathan McBride, Silver Creek Gin, Holly Bluff, MS; and Todd Waters, Coastal Carolina Gin, Pantego, NC. Comments from each of the panel members are summarized in the following paragraphs.

Ed Barnes – Numbering Standard and Technology Trends

One effort that should facilitate electronic module tracking is the American Society of Agricultural and Biological Engineers (ASABE) Cotton Engineering committee approved a standards proposal to develop a voluntary numbering system for cotton modules and specify the associate technology to support electronic data tracking (project number X647). This means that when an equipment company, tarp manufacturer, or module tag distributor wants to use something like a bar code, QR code, or RFID tag to store a module number, gins will not need multiple kinds of hardware and software systems to read them. The current draft of the standard proposes to use a GS1 product code to help provide a globally unique identifier for each module. Similar to the permanent bale identification tag for cotton bales, the GS1 manufacturer's code will be analogous to the gin code, and then the module serial number analogous to the bale number. It is hoped that the standard will be balloted and approved in the summer of 2016.

Some other activities that will help ginners adopt electronic module tracking will be new software tools. For example, a demonstration application, developed by Cotton Incorporated's Fiber Competition Division, provided a means to read the RFID tags with a hand-held scanner and store the GPS coordinates for the location of that module. The app was used to evaluate the performance of the hand-held scanner and also explore additional benefits electronic module tracking could bring to both producers and ginners. The hand held scanner performed well and was able to read modules from about 15-ft away. An example was provided how GPS coordinates could be used to quickly generate an inventory map of a gin yard. Another app related to tracking RFID tags is available from eCotton (EWR). The new mobile application can be used to dispatch module truck drivers to the field and when coupled with a hand-held RFID reader verify the correct modules are being loaded.

Christopher Murray – Overview John Deere's Harvest Identification System

Harvest Identification, Cotton is a process in which the RFID tags embedded in the module wrap are automatically documented for use by the grower, gin, or other trusted advisor to aid in agronomic decision support, improve traceability of round modules, and simplify module booking process while optimizing the delivery process. Starting in 2015, every module wrap contains four RFID tags so that a tag should be visible to a scanner under most situations. The tags are Monza® 5 UHF tags made by Impinj and contain an electronic product code following a GID-96 standard. The first part of the code identifies that the tag is associated with a round module, there is a code for the RFID tag position, and a code for the portion number on the roll. The last nine characters correspond to a hexadecimal number that is equivalent to the 11-digit serial number printed on the tag.

For every module created, the machine records a number of parameters including: the module serial number, GPS coordinates where the module was created, client, farm, field, variety, operator, gin ID, producer ID, and time. John Deere is currently reviewing the feasibility of adding module weight and seed cotton moisture in the future.

Jonathan McBride – RFID technology for module tracking at Silver Creek Gin

Silver Creek Gin has used the RFID tags on round modules as the only identifier for the last two seasons. An important first step is that the gin is the first to receive a grower's module wraps so they can record the serial numbers of that wrap. This way if there is any delay or problem with the data from the harvester, the gin will at least have record of module ownership. The gin's module feeder has been modified with load cells so that the weight of individual round modules can be recorded. The gin then uses module averaging for each round module (a four lint bale average) so the fiber quality associated with each round module is known. In the last season, the 11-digit serial number was used as the module number and the cotton classing office had to append the number to fit their format, but no problems were noted. Silver Creek has had custom software developed to assist them in implementing this complete tracking system.

Todd Waters – RFID technology for module tracking at Coastal Carolina Gin

Coastal Carolina gin has been exploring different approaches to use the RFID tags to track modules for the last three years. Currently, they have a three-antenna array over their weighbridge to record module numbers as loads are delivered. The gin uses eCotton software and they have been able to make use of some new features in that software that allows them to log RFID numbers as the modules cross the weighbridge. It provides immediate feedback on the number of unique module IDs per load. Several of the gin's customers deliver their own modules on flatbed trailers, so the gin may receive cotton within thirty minutes of when it is harvested. Therefore, full integration of the data stream from picker to their software system will ultimately be needed. Currently, it is a bit cumbersome to download the files from the John Deere website and import it into the eCotton software.

Concluding Comments

The success of the ginners on this panel is a good indication that electronic module tracking could be a good option for many U.S. cotton gins. In the not too distant future, the data will be used beyond logistics and ownership information. Attributes of a given cotton module will allow ginners to "precision gin" cotton based on attributes like its moisture content, variety, and leaf hairiness rating. The ability to associate fiber quality back to an area of the field could also lead to a better understanding of why quality varies within a variety. It could be especially useful in identifying sources of extraneous matter (bark, grass, etc.) so management changes can be made in the future.