RADIO FREQUENCY IDENTIFICATION FOR IMPLEMENTING TRACEABILITY IN THE COTTON PRODUCTION IN THE BRAZILIAN MIDWEST

M. A. Dota, C. S. Junior, E. Weschter
Institute of Exact and Natural Sciences
University of Mato Grosso – UFMT
Rondonópolis – MT, Brazil

C. E. Cugnasca
Computer and Digital Systems Engineering Department
School of Engineering, University of São Paulo – USP
São Paulo – SP, Brazil

ABSTRACT

This paper proposes a traceability chain in the context of cotton production presenting architecture for data collection along the cotton production chain from the planting to the processing stage in Mato Grosso State, located in the Brazilian Midwest. The proposal implementation was developed to provide a distributed environment with multiple data source collection in legacy systems, using Radio Frequency Identification – RFID to identify logical units at various stages of cotton production. This research is an innovation project developed at the Unisystem Agricultural Systems enterprise jointly with researchers from the Federal University of Mato Grosso – UFMT. This project intends to design and to implement an infrastructure model for cotton traceability, following a practical approach. The use of traceability in this case is focused on meeting the demands of a new value-added product market related to the consumer.

Keywords: RFID, Traceability, Cotton.

INTRODUCTION

The International Cotton Advisory Committee – ICAC projection for fiber in cotton production for crop year 2012/2013 is expected to reach an amount of 15.19 million tons, according to a forecast released in August 2012. In the Brazilian context, according to the Agriculture Minister, livestock and supply of Brazil cotton cultivation have grown especially in the Midwest. In particular, cotton fiber exports increased twice in one season in 2003/2004. Brazil produced 1.2 million tons, an increase by 46.3 % compared to the previous harvest. With this scenario, it is important to use intelligent systems for managing data and processes. Traceability is an important example for this, allowing monitoring of processes related to the production chain by recovering data at several steps and

contributing to quality assurance for a given desired final product and derivatives. This investigation focus is cotton production in Mato Grosso State, located in the Brazilian Midwest region. The absence of infrastructure that allows creating traceability in the cotton production chain, from planting to derivatives, hinders the supply chain visibility and thus data that could improve the processes as a whole and indicate possible fixes. Another important point is to improve quality standards for reducing production costs and adding value to the final product.

RESULTS AND CONCLUSIONS

The investigation was started in 2013 and several deficiencies were identified regarding the monitoring of the cotton production process, such as restricting the data generated by this segment system, lack of data sharing. Another important point is the allocation of responsibilities at each stage of the production chain, as it makes it possible to identify the source of the data in a bidirectional manner. Although several visits were made to farms and related businesses cotton production, the research used a particular company to collect and to deploy the system to the testing phase. Figure 1 shows the physical layout of the company and used for the tests with a system resource interface for the cotton processing step.

Figure 1. Unit processing layout and traceability system interface.

CONCLUSION

The development of the system presented some challenges for the processing of data generated at various stages of the production chain; determining which classes of data are relevant for establishing the traceability properly required several technical visits for monitoring processes from selection to the improvement of the variety. The system is undergoing testing with the technical staff of both the agricultural and the technological area with expected completion in late 2014 and it is intended to be in real-world use permanently at the cotton center in the Midwest region of Brazil starting in 2015.

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