REPORT ON NEW LINT CLEANING TECHNOLOGY

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Abstract

Process control of ginning by Zellweger Uster's Intelligin® system has, to date, focused primarily on the control of entire sections of ginning equipment by allowing the stick machine and lint cleaners to be completely bypassed in the system. The introduction of Lint Cleaner Louver® technology, by Continental Eagle, now allows the use of a prescribed percentage of saw-type lint cleaner grid bars by effectively disabling the cleaning ability of individual grid bars. Both systems may now be combined to optimize the efficiency of the louver technology. Decisions regarding the level of grid bars to use are made 'on-the-go' as information from Intelligin® sampling stations is fed into algorithms within the system's software that correlate color and trash to USDA CCC Loan tables.

In the 2002 ginning season, grid bar louvers were installed on two Continental Eagle 24D lint cleaners as part of a complete Zellweger Uster Intelligin® installation at the Milstead Farm Group, Inc. ginning operation in Shorter, AL. Two experiments were conducted to evaluate the effectiveness of the louver technology and the ability of the Intelligin® system to control the louvers. Experiment 1 was conducted as a RCB design with five replications. Replications were groups of six modules of the same producer, field, variety and harvest date that were randomized. Randomized treatments consisted of Intelligin 'ON' and Intelligin 'OFF' and were imposed on three successive modules for each treatment. Ginning was temporarily halted at the beginning, end and between treatments to allow the system to be completely voided of seed cotton and/or lint. Replications were carried out on different days to reduce variability in time of day. Experiment 2 was conducted as a RCB design with four replications and eight treatments. Replications consisted of four modules total that were ginned with each of the eight randomized treatments being imposed for the duration of one bale. Ginning was temporarily halted between each bale to allow the system to be completely voided of seed cotton and/or lint. All four replicate modules were ginned in succession. Samples for USDA classing and AFIS were collected both before and after lint cleaning and waste material from the lint cleaners was collected prior to any mote cleaning.

Machine usage percentages for Experiment 1 were retrieved from the Intelligin® database and used to estimate material loss data according to the same algorithms within the Intelligin® software that are used in making control decisions. Machine usage data showed a significant decrease in the amount of time that the stick machine was used and the number of grid bars used in ginning when the Intelligin Process Control system was operating. Stick machine usage dropped from 100% to 42% with the use of process control. Grid bar usage when the Intelligin system was operating averaged four grid bars per bale, whereas the conventional ginning method uses eight grid bars. Waste collection data from Experiment 2 indicate a range of waste material of approximately six pounds material per bale between the use of one and eight grid bars. Data correlated to the waste algorithms of Experiment 1 indicate approximately 12 pounds material per bale was removed with four grid bars compared to 20 pounds material per bale using eight grid bars. This range of eight pounds material per bale correlates well with Experiment 2, as the rate at which material is lost tends to level off at the upper ends of grid bar usage since most of the cleaning is occurring in the first few grid bars. Approximately two and four pounds material per bale was lost due to stick machine usage for the Intelligin 'ON' and 'OFF' treatments, respectively. No effect on staple length was detected but the Intelligin® system with Louver technology did decrease short fiber content (SFC) while increasing Uniformity, Leaf, Trash and Visible Foreign Matter (VFM%).

The experiments conducted indicate that Louver technology for 24D lint cleaners is effective in increasing the amount of material added to the bale that would normally be lost as waste. Significant increases in this material would increase the ginning efficiency for the producer and increase profit potential. The retention of material at the lint cleaner occurs continuously, but the amount of material retained varies with the cotton being ginned. Process control of the louvers by the Intelligin® system is very efficient and effective. The system's ability to control the louvers 'on-the-go' is seamless with no interruption in ginning capacity.