SPINNING INTELLIGIN PROCESSED COTTON Jack Mace Zellweger Uster Knoxville, TN

Abstract

The Uster[®] IntelliGin System allows real-time measurements of fiber color, trash, and moisture during ginning. It features control of dryer temperature for optimum fiber moisture, and control of seed cotton and lint bypass valves. Reported here are studies of the effect of IntelliGin processing on textile processing efficiency and product quality. It was concluded from spinning trials that IntelliGin-processed cotton had improved fiber properties, which translated into higher quality of finished sliver and improved single-end yarn strength.

* * * * * *

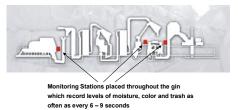
USTER® IntelliGin

The System

- Real time measurements of fiber color, trash & moisture
- Control of dryer temperature for optimum fiber moisture
- · Control of seed cotton and lint bypass valves

Gin Process Control System

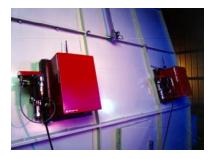
USTER® IntelliGin



USTER® IntelliGin: Readings

- Moisture: Seed cotton / lint
- Trash: Seed cotton / lint
- Color: Seed cotton / lint

Sampling Station - Module Feeder



Sampling Station - open



Screen Shot - from main console

								80	1 2
Be Edt You Help									
	Naport Card	?							
-	TET 78	1		The B	1 IP	-	MES.	L SI.	23
—• •		-40	-		副戰	. 💶	(ALLE)	4	1
	A1727 R.1057		A1457 F	1027			****		
lotalet 14904 Produce	er Zelbenger Farro								
XI:0 Bales/hour Tecomendation: 0 Stick									
account of the	and the second second								
	O Station I	A		0	Station 2A			Station 3.4	10
	C							·	
15 8	Mointum 7.4 Color 81-3	2		Colo	tum 5.4 51-1	L 1		Color 41-3	
1. 1	Color 81- Truch % 6.51	9		Colo	51-1			Color 41-3 Truch % 0.08	
	Color \$1-3	9		Colo True Grade	51-1			Color 41-3	
N.	Color \$1- Track % 6.5 Grade \$1.4	8		Colo True Grade	51-1 16 0.25 54-1			Color 41-3 Truch % 0.08 Grade 41-1	
	Color \$1- Track % 6.5 Grade \$1.4	8		Colo True Grade	51-1 16 0.25 54-1			Color 41-3 Truch % 0.08 Grade 41-1	
Deterfice	Color 81- Trach % 6.53 Geals 81-4 Readings 4		Motive	Colo True Grade	51-1 16 0.25 54-1	- Pri		Morthus 3.2 Color 41-3 Truch % 0.00 Geads 41-1 Raadage 6	
8/17/991413:07	Color 81- Trach % 6.51 Geals 81-6 Reading: 4 Bale 10 2009721	Bale Kay	Module 14904	Colo Trai Gash Read	51-1 53-0.25 54-1 ing 5 <u>Mointure</u> 4.75	73.9		Grade Grade Grade Grade Grade 41.2	•
8/17/991413:07	Color 80- Trach 16 633 Guide 80-4 Readings 4 Bale ID 2009/723 2009/723	1 Date Key 3023 3027	Module 14904 12016	Colo Trai Geol Real	Mointure 4.76 4.76 4.76 4.90	73.9	0.9 0.9	General S.2 Color 41-3 Truch % 0.08 General 41-1 Readings 6 General 41-2 39-2	Ŀ
8/17/99141307 8/17/99141006 8/17/99140836	Color 83: Trach N 6:33 Gools 82:4 Realing 4 Bale 10 2009/723 2009/722 2009/723	Bale Key 9020 9025	Module 14904 12016 12016	Colo True Geak Read 3160 3180 4.111	Mointure 4,75 4,90 4,75 4,90 5,115	73.9 74.2 73.6	0.9 8.9	Grade 41-3 Truck % 0.08 Grade 41-1 Realings 6 Grade 41-1 Realings 6	Ŀ
8/17/99 14:13:07 8/17/99 14:10:06 8/17/99 14:08:36 8/17/99 14:07:03	Color 81- Trach 16 - 53 Grade 81-4 Realings 4 81-4 Realings 4 81-4	500 907 905 905	Module 14904 12016 12016 12016	Colo True Grad Read 3160 3180 4.111 4.25	4.50 Moinure 4.76 4.90 5.15 5.09	73.9 74.2 73.6 73.2	0.9 0.9 0.9 0.9	Grade 41-2 Truck 56 0.08 Grade 41-1 Readings 6 Grade 41-1 Readings 6 41-2 37-2 41-2 41-2 41-2	Ŀ
8/17/99 14:13:07 8/17/99 14:10:06 8/17/99 14:08:36 8/17/99 14:07:03 8/17/99 14:07:03	Calar 81- Trach % 653 Goals 82-4 Realing 4 82-4 82-2 2009/22 2009/22 2009/22 2009/22 2009/22 2009/22 2009/21 2009/21 2009/21 2009/21	Bale Kay 9027 9027 9025 9025	Module 14904 12016 12016 12016 12016	Colo True Goal Read 3160 4.11 4.26 4.31	Mointure 4,75 4,76 4,75 4,75 4,90 5,115 5,05 4,54	73.9 74.2 73.6 73.2 73.1	8 0.9 0.9 0.9 0.9 0.9 0.9 0.9	Grade 41.3 Truck 16 0.08 Grade 41.1 Readings 6 Grade 41.2 41.2 31.2 41.2 31.2 41.2 41.2 41.2 41.2 41.2 41.2 41.2 41.2	ŀ
8/17/99 14:13:07 8/17/99 14:10:06 8/17/99 14:08:36 8/17/99 14:07:03	Color 81- Trach 16 - 53 Grade 81-4 Realings 4 81-4 Realings 4 81-4	8 8 9 9 9 9 9 9 9 9 9 9 9 9 9	Module 14904 12016 12016 12016	Colo Trud Gud Real 319 310 411 4.34 4.01	4.50 Moinure 4.76 4.90 5.15 5.09	73.9 74.2 73.6 73.2	8.9 8.9 8.9 8.9 8.9 8.9 8.9 8.9 8.9 8.9	Golder 41.2 Truck N 0.00 Golde 41.1 Readings 6 Golde 41.1 Readings 6 41.2 31.2 41.2 41.2 41.2 41.2 41.2 41.2 41.2 4	ŀ
8/17/9914(13:07 8/17/9914(10:06 8/17/9914(00:36 8/17/9914(00:36 8/17/9914(05:22 8/17/9914(00:32	Caler 1813 Truch 16 33 Geule 1814 Predings 4 1000723 2009723 2009723 2009723 2009723 2009723 2009723 2009723 2009723	Bale Kay 9027 9027 9025 9025	Module 14304 12016 12016 12016 12016 12016	Colo True Goal Read 3160 4.11 4.26 4.31	51-1 15 0.25 54-1 mp 5 Mointure 4.76 4.90 5.15 5.09 4.54 4.70	739 742 736 732 731 737	8 0.9 0.9 0.9 0.9 0.9 0.9 0.9	Grade 41-2 Truck 5: 0.08 Grade 41-1 Reading: 6 Grade 41-2 31-2 41-2 41-2 41-2 41-2 41-2 41-2 41-2	

Automatic Dryer / Moisture Control

New patented moisture sensors - high level of accuracy based on:

- Maintain optimum moisture at gin stand
 - 5% 6%
- Significantly reduce dryer temperatures
- Reduce fiber damage

Trash Reading

System recommends bypass or engagement of cleaning stages

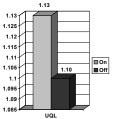
- Minimize mechanical fiber damage
 - Stick Machine
 - Lint Cleaner
- Immediate feedback of USDA leaf grade

Color Reading

- Built-in HVI colorimeter
- Rd and +b readings
- Immediate feedback of HVI color grade
- New patented flash technology

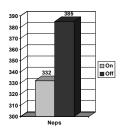
Fiber Quality UQL Length 2001 Trials

- IntelliGin On / Off Trial
- 4 modules on
- 4 modules off
- Southeast location



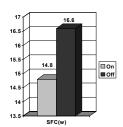
Fiber Quality Neps 2001 Trials

- IntelliGin On
 - 1 lint cleaner
 - Reduced dryer temp50% stick machine
- IntelliGin Off
 - 2 lint cleaners
 - Increased dryer temp
 - 100% stick machine



Fiber Quality Short Fiber Content 2001 Trial

- Increased moisture
- Reduced pre-cleaning
- 1 lint cleaner



ITT Spinning Trial

- 2 bales processed with IntelliGin
 - 2 incline cleaners
 - 1 lint cleaner
 - Reduced dryer temperature
- 2 bales processed without IntelliGin
 - 1 impact cleaner
 - 1 stick machine2 lint cleaners
 - 2 lint cleaners
 - Normal dryer temperature
- Trials conducted at Russell Corp T&E Center
 Results published by D. McAlister, III

Spinning Trial

Objectives

- Determine impact of:
 - Reduced fiber neps
 - Reduced short fiber content
 - Increased length and strength
 - Increased trash content

HVI Fiber Properties

IntelliGin On / Off Trial

	Without IntelliGin	With IntelliGin
Micronaire	4.4	4.4
Length	1.15	1.18
Uniformity	83.2	84.6
Strength	31.1	32.9

HVI Fiber Properties

Color and Leaf Grade

	Without IntelliGin	With IntelliGin
Color Grade	31	41
Leaf Grade	3	4

AFIS Fiber Properties

IntelliGin On / Off Trial

	Without IntelliGin	With IntelliGin
Neps	248	176
UQL (w)	1.19	1.22
SFC (w)	7.4	6.3
VFM%	.90	1.8

Waste Analysis

Percent Waste Removed

	Without IntelliGin	With IntelliGin
Opening Line	2.19	2.45
Carding	3.99	3.06
Ring Spinning (Pneumafil %)	.54	.34
Comber Noils %	13.2	11.1

Yarn Quality Data

	With IntelliGin			Without IntelliGin			
	Ring	OE	MJS	Ring	OE	MJS	
Single-End Strength (g)	461	320	365	428	309	309	
Min. single-end strength (g)	410	297	309	400	291	255	
Classimat A1	103	16	231	76	7	86	

Spinning Trial Conclusion

- IntelliGin samples contained trash particles with an increased size that proved easier to remove during opening and carding
- Improved fiber properties at the bale translated to higher quality finished sliver
- Improved single-end yarn strength from IntelliGin cotton on all spinning systems