## PRELIMINARY EVALUATION OF FEEDER AND LINT SLIDE MOISTURE ADDITION ON GINNING, FIBER QUALITY, AND TEXTILE PROCESSING OF WESTERN COTTON Derek Whitelock USDA-ARS Southwestern Cotton Ginning Research Laboratory Mesilla Park, New Mexico Chris Delhom USDA-ARS Southern Regional Research Center New Orleans, Louisiana Carlos Armijo USDA-ARS Southwestern Cotton Ginning Research Laboratory

Mesilla Park, New Mexico

## **Abstract**

The objective of this study was to evaluate the effects of moisture addition at the gin stand feeder conditioning hopper and/or the battery condenser lint slide on gin performance and Western cotton fiber quality and textile processing (Figure 1). The test treatments included no moisture addition, gin stand feeder hopper humid air moisture addition, battery condenser lint slide humid air moisture addition, and both additions. During each treatment that spanned ginning 15 bales, gin machinery energy and gas consumption readings were acquired and seed cotton and lint samples were obtained for moisture, fiber quality, and textile spinning analyses. While there were no significant differences in High Volume Instrument (HVI) measurements among the four moisture addition treatments, there were some important differences found in bale and energy data (Table 1). The bale moisture content was significantly higher when the lint slide moisture system was on. Also, bale weight and bale value were greatest with both systems (feeder hopper and lint slide moisture) operating. It is not known at this time whether the increase in bale value was solely due to additional moisture or if subtle fiber quality differences combined with increased bale weight may have affected bale value. Average press power and energy to press a bale were less when the lint slide moisture system was on. These energy data suggest that the moisture addition at the lint slide could reduce press forces and possibly wear. Further work to be conducted includes a more complete statistical analysis of the data to include Advanced Fiber Information Systems (AFIS) measurements and spinning test data. Also, further testing to increase the number of data points would be beneficial in improving the certainty of the results.



Figure 1. Moisture addition systems: gin stand feeder hopper (left) and battery condenser lint slide (right).

			Moisture	System	
		Fe	eder Hoppe	er/Lint Slide	e
		OFF/OFF	ON/OFF	OFF/ON	ON/ON
Bale					
l	Moisture (%)	4.3 b	4.2 b	4.8 a	4.9 a
1	Weight (lb)	473 c	480 b	487 b	498 a
	Value (\$)	268 b	272 b	275 b	282 a
Ener	gy				
1	Ave. Press Power (kW)	43.3 b	44.1 b	41.7 a	41.5 a
]	Press Energy (kW-h per bale)	1254 b	1243 b	952 a	1078 a
11		. 1	· · · · · · · · · · · · · · · · · · ·	1:00	0.05

|--|

Means in a row followed by different letters are significantly different ( $\alpha = 0.05$ ).

## <u>Disclaimer</u>

Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the U.S. Department of Agriculture. USDA is an equal opportunity provider and employer.