EFFECT OF HARVESTING METHODS AND COTTON FIBER MATURITY ON YARN QUALITY Eric F. Hequet Noureddine Abidi Fiber and Biopolymer Research Institute – Texas Tech University Lubbock, TX Randall Keith Boman Oklahoma State University Altus, OK John Wanjura USDA-ARS Cotton Production and Processing Research Unit Lubbock, TX

<u>Abstract</u>

Large-scale tests undertaken by Texas AgriLife Extension in Lubbock, TX, were the base for our investigations. The tests were conducted in eight locations over a three years period. Each test consisted of four large plots. Each large plot was divided into two blocks. Each block corresponded to one module. Half of the blocks were harvested with a stripper with field cleaner and half with a picker. The stripped cotton was ginned with the usual industrial sequence for stripper harvested cotton. The gins used a less aggressive ginning sequence for the picker harvested cotton (bypassing some seedcotton cleaners and one lint cleaner). This totaled 64 modules. From each module, one bale was purchased. The bales were sampled and fiber quality determined (HVI and AFIS). Then, spinning tests were performed. Ring spun yarn 30Ne was produced (carded and combed).

Results are as follows:

Picker harvested cottons have on average better fiber properties:

- Micronaire: +0.17 (+4.3%)*
- UHML: +0.01 inch (+0.7%)
- UI: +0.5 % (+0.6%)
- Reflectance: 0.6 % (+0.8%) and Yellowness: -0.3 (-3.2%)
- Neps: -130 count/g (-29.0%)
- UOL: +0.01 inch (+1.4%)
- L(n): +0.03 inch (+3.3%)
- L(n)CV: -2.3 % (-4.3%)
- SFC(n): -2.5% (-8.6%)
- VFM: -0.8% (-35.9%)
- Fineness: +2.9 mtex (+1.9%)
- IFC: -0.7 % (-7.3%)
- MR: +0.01 (+1.2%)

*100 x (picker – Stripper)/Stripper

Picker harvested cottons have on average better carded ring spun yarn quality:

- Opening waste: -0.5% (-15.5%)
- Card waste: -0.7% (-16.5%)
- CVm: -0.39% (-2.4%)
- Thin places: -4 count/km (-18.8%)
- Thick places: -49 count/km (-18.4%)
- Neps 200%: -99 count/km (-24.4%)
- IPI: -151 count/km (-21.9%)
- Hairiness: -0.16 (-2.9%)

Picker harvested cottons have on average better combed ring spun yarn quality:

- Noils percentage: -0.85% (-4.9%)
- CVm: -0.14 % (-1.1%)
- Thin places: -0.07 count/km (-11.3%)
- Thick places: -5.4 count/km (-29.4%)
- Neps 200%: 19.9 count/km (-33.6%)
- IPI: -25.4 count/km (-32.5%)
- Hairiness: -0.08 (-1.7%)

In conclusion, for lower micronaire cottons, picker harvesting is clearly beneficial. It results in better fiber quality; more importantly, it results in better yarn quality for all evenness-related parameters. However, in 2010-11, micronaire readings (≥ 4.0) were much higher than in 2008-09, and 2009-10. In these conditions, it appears that picker harvesting does not benefit yarn quality.