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BOLL SAMPLES, GRAB SAMPLES AND COMMERCIALLY GINNED BALES: A TEXAS HIGH PLAINS COMPARISON

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Abstract

With the advent of transgenic technologies and highly varying cotton (*Gossypium hirsutum* L.) fiber quality, unbiased cultivar performance data are becoming more important for producers. The challenge exists to provide high quality data for producers while minimizing the efforts required to achieve the goal. Small-plot data are deemed very important for screening large numbers of cultivars and strains. To provide data on economic performance of cultivars/technologies, larger plot sizes are required. During 2000, 2001, and 2002, large-plot replicated systems cultivar trials were conducted at three producer-cooperator locations in the Texas High Plains (Crosby, Parmer, and Yoakum counties). These trials were commercially planted, harvested and ginned. Three replications of 13 to 15 cultivars per location were used (typically greater than 3 acres total per cultivar). Crust Buster boll buggy weigh wagons equipped with Weigh Tronix Model 915 3-bar integral electronic digital scales were used to capture plot weights before moduling. All replications were combined to generate one module per cultivar. These modules were ginned at local gins. Prior to ginning, module feeders were cleaned out, the gin stream cleared, and seed rolls dumped. Remnant bales were ejected from the press, tied, and weighed. After ginning the module, the process was restarted for each cultivar module. High Plains gins equipped for handling stripper-harvested bur cotton typically use the following machinery in sequence: incline cleaner, bur and stick machine, tower dryers, second incline cleaner, small bur and stick machine, gin stand feeder/cleaner, gin stand, and finally two lint cleaners. Depending upon bur cotton condition, some components may be bypassed (stick machine, dryers, and/or lint cleaner). Commercial lint and seed turnouts for each cultivar module were obtained. The lint and seed per acre were determined after applying commercial turnouts to plot bur cotton yields. The USDA-AMS classing and subsequent CCC Loan values were determined for each bale within the cultivar module.

Grab sampling and boll sampling are generally accepted as important techniques for determining relative differences in lint turnout and fiber quality for small-plot trials. In these trials, an 800-1000g sample of bur cotton was obtained at the weigh wagon from each replication before moduling. A 50-boll sample was also obtained from each plot prior to harvest. Mid-strata first position bolls were randomly harvested. The grab samples and 50-boll samples were ginned at the Texas A&M Research and Extension Center at Lubbock using a 4-cylinder horizontal cleaner, an extractor feeder-cleaner, a 10-saw Continental Eagle gin stand followed by a cut-down Moss lint cleaner and cut-down Moss lint condenser. Total, lint and seed weights were obtained and turnouts were determined for both the grab samples and 50-boll samples. An additional seedcotton weight was obtained for the 50-boll samples. The three-replication turnout means were used to convert bur cotton weights to lint per acre. The lint samples used for fiber property determinations were taken from the middle of the lint bat and submitted for HVI analyses to the Texas Tech University International Textile Center (ITC) at Lubbock. The CCC Loan value was calculated by plot. The HVI data from the ITC do not include a classer's bark contamination call. The 3-replication means of fiber properties and Loan value were used to correlate with the mean of all commercial bales for each cultivar module.

The 2000, 2001, and 2002 data were used from the three locations (9 site-years), which resulted in a total of 114 observations for each response variable included in the correlation. For standardization purposes, all Loan values were calculated using the 2003 Loan chart for Lubbock. Correlations for grab sample and the 50-boll sample data versus commercial gin data were performed for the following parameters: lint turnout, lint yield, micronaire, HVI

length, HVI uniformity, and CCC Loan value. When compared to the commercial results, biases of grab sample and 50-boll sample results were compared. Biases for grab sample results were generally minimal for the above parameters, except for HVI length, uniformity and Loan value. Biases for 50-boll sample results were typically much larger for all above parameters, and the correlation tended to be poorer for HVI length and uniformity. A very poor relationship existed for 50-boll sample Loan value when compared to commercial data. Results of these comparisons indicate that although some biases exist among individual parameters, the grab sample technique was adequate for determination of the parameters producers deem important in cultivar/technology evaluation. The 50-boll sampling method resulted in considerable bias and poorer relationships when compared with the commercial results.