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Small Sample Techniques to Evaluate Cotton Variety Trials

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Selection of cotton cultivars for production or in breeding programs are often based on data from small samples of cotton collected from small research trials, so it is important to understand how these results compare with conventional processing. The objective of this manuscript was to determine if differences in gin turnout and High Volume Instrument (HVI) fiber properties after conventional processing were predictable with two small sample techniques. Three research trials, each including 65 cultivars, were evaluated with two small sampling techniques (hand-picked boll samples and machine-picked grab samples) and with the microgin, which represented conventional processing. Boll samples overestimated gin turnout and underestimated leaf. Grab samples overestimated gin turnout, micronaire, and leaf and underestimated reflectance. Boll and grab samples predicted cultivar differences in strength, micronaire, yellowness, gin turnout, and length. Grab samples predicted cultivar differences in reflectance and leaf, but boll samples did not predict these differences. Neither grab samples nor boll samples correlated well with uniformity from the microgin. For most properties, cultivar *F*-values were higher for the microgin data, so small differences in cultivars may only be revealed after conventional processing. These small sample methods should continue to be a practical tool to predict cultivar differences in gin turnout and most fiber properties.