

COTTON VARIETY TESTING: SMALL PLOTS VERSUS FIELD SCALE PLOTS**Chris Main****University of Tennessee****Jackson, TN****Alexander M. Stewart****Louisiana State University****Alexandria, LA****Abstract**

Small plot Official Variety Trials are often criticized for not representing field scale production practices. Failure to recognize limitations of both testing systems can lead to false conclusions. Inflated yield response from alley effects in small plot trials can increase yields by 15%. Soil type variability in large field trials can benefit or penalize a variety simply by placement in the field. In an attempt to address these issues a comparison of small plot replicated variety trials to large single replication strip trials was conducted.

Five cotton varieties contained in both University of Tennessee OVT and County Trials from 2007 and 2008 were evaluated for different responses in the two test systems. A simple model of $\text{yield} = \text{variety} + \text{replication} + \text{variety} * \text{replication}$ by trial type was utilized. For the large plot trials, county locations were analyzed as replicates. The main effect of trial type indicated a significant difference between the two test systems. The small plot trial yields were 18-22% higher than the large plot strip trials. This is more than can be accounted for by inflation from alley effects. However, the ranking of the varieties in each trial was similar.

The nature of small plot testing where as many factors are controlled as possible leads to a measure of genetic yield potential. In large plot testing each location has different management plans because of different cooperating producer. If investigated enough locations, large plot testing can provide a measure of environmental adaptability of a variety. These differences could account for the absolute differences in lint yield. If end users of variety testing data compare yield rankings between each test system they should feel confident in a variety that test well in both systems.