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ARE COTTON YIELD MONITORS CONSISTENT ACROSS VARIETIES?

Since the early 1990s, yield monitor adoption has increased rapidly, with nearly 50% of corn and soybean acres in the U.S. being harvested using yield monitors by 2006. However, cotton acres harvested using a yield monitor during the same time period was only estimated to be around 3% and more recent data suggest that not more than 10% of current cotton acres employ yield monitors.

The slower adoption rate in cotton was primarily due to equipment problems in the early models including poor accuracy, failure to maintain calibration, and sensors becoming blocked by dust and other materials. Recent evaluations conducted at the University of Georgia have identified several models of cotton yield monitors to be accurate within 10-15% and some models were within 5% of actual bagged cotton weights. This research shows that current cotton yield monitors, when properly calibrated are very accurate compared with the earlier models.

Current yield monitors typically utilize optical sensing or microwave technologies to estimate seed cotton weight. As the research in Georgia demonstrated, this method is fairly accurate; however, the ability of light-intercepting yield monitors to accurately estimate yields for different varieties without being re-calibrated is not well documented. Nonetheless, the sole use of yield monitors in replicated on-farm cotton variety trials is not uncommon.

Cotton Incorporated recently funded a study to evaluate the performance of different cotton yield monitors across several varieties. Dr. Randy Taylor, Oklahoma State University, coordinated the project, which included research sites in six states across the cotton belt. The main objective was to determine the actual error associated with using yield monitors to evaluate on-farm cotton variety tests.

Depending on the model of yield monitor used, mean error ranged from -2.6% to -24.5%, with error being highly significant by variety. Some of the yield monitors grouped the varieties similar to the reference scale (were accurate within a variety); however, the researchers noted that there might be additional error among variety comparisons when yields are calculated to a field scale.

Another study conducted in Arkansas reported similar results, with error ranging from -6.6% to +16.5% across varieties. However, a positive finding in that study was a lack of variety-by-test interaction that suggested a good level of yield monitor accuracy for a particular variety across different locations.

Data from these studies suggest that, at this point, yield monitor data alone should not be relied on to determine yields from cotton variety comparison studies. Dr. Taylor noted "no clear methods to adjust for error among varieties have been discovered, but hope is not lost (but is fading significantly)."

To learn more about using yield monitor data and other cutting edge precision ag research, make plans to attend the next InfoAg July 29–31 at the Union Station Hilton in downtown St. Louis, MO. Stay informed by visiting www.infoag.org and following @InfoAg.

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