

# DEVELOPMENT OF TECHNOLOGIES TO ESTIMATE SUGARCANE YIELDS AND PROVIDE IMPROVED CROP MANAGEMENT SCHEMES

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Three overhead optical yield monitors were built and tested in Louisiana (Figure 1) and one in Brazil. These yield monitors contained faster electronics, a built-in GPS, and were constructed of aluminum to reduce weight. The yield monitors provided satisfactory results for yield mapping (Figures 3 and 4), but weight errors were slightly higher (Figure 2) than previous years having an average error of 10% (versus 6%). Yield comparisons were good and had only a 5% offset, but standard deviations were high in some numbers (note spread of data around line in Figure 3). Still, smoothing in the precision farming software (Farmworks® at 0.02 acres averages) created well-defined yield variance zones (Figures 4 and 5). Reasons for the increased error could have been that testing primarily occurred on smaller plots, which only generated weight comparisons up to 1600 lbs. Previous yield monitors were tested with weight values up to 6000 lbs. creating a “wider” calibration set. The calibration equation was monitored over a one-month time-period and did not show any major changes which indicates resiliency of the system to field effects.



Figure 1: Newer overhead optical yield monitors composed of aluminum frame to help reduce weight and featuring built-in GPS and wireless capabilities.

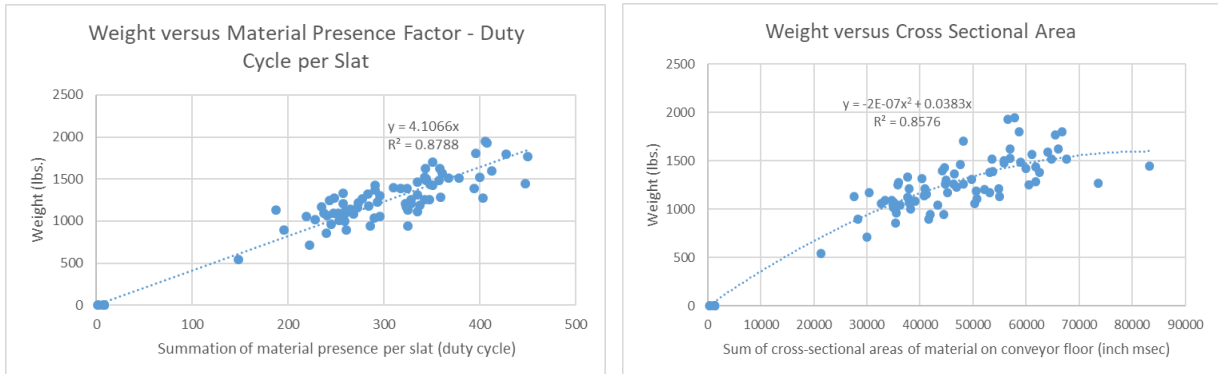


Figure 2: Calibration equations for material presence (duty cycle per slat) and cross-sectional area of material (inch x msec).

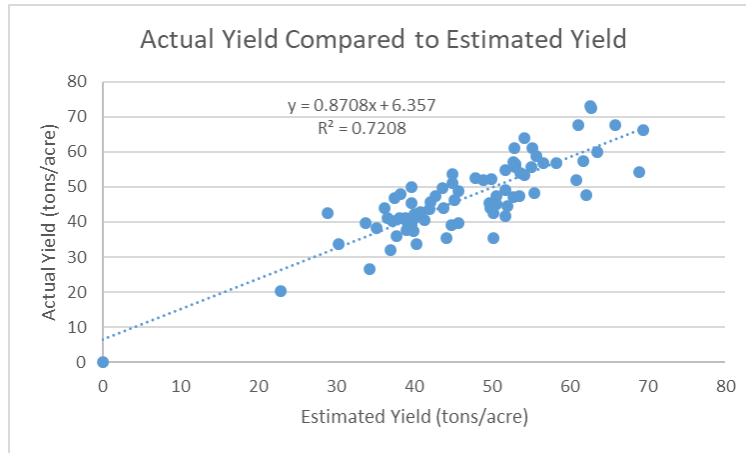


Figure 3: Comparison of actual yield to estimated yield.

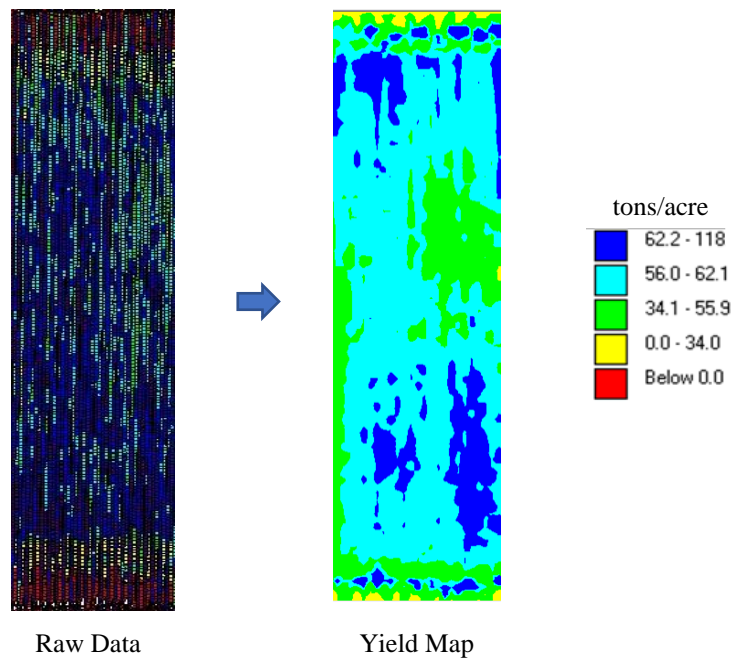


Figure 4: Yield map recorded on professional display and processed in Farmworks® (Bunkie, LA)

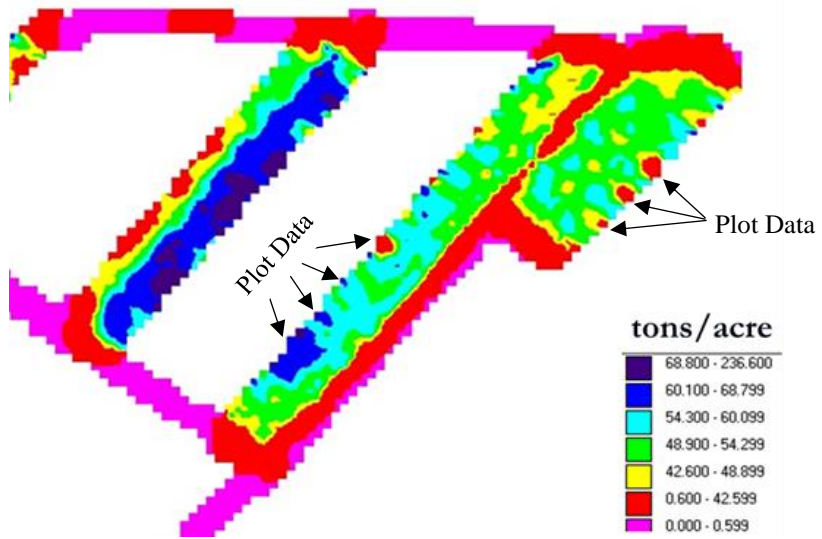


Figure 5: Sugarcane map showing plot data seen in map.