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Cotton Picker Yield Monitor Calibration

Cotton growers who anticipate collecting yield data this season should take the time to check yield monitor components to ensure accurate data collection.

Yield monitors are the second most common precision agriculture technology used today. Proper calibration is key if management decisions, prescriptions, or profit maps are to be generated from yield data. It is important to note that using a yield monitor to evaluate decisions that were made throughout the growing season is an extremely valuable tool. It is critical prior to calibration to make sure the cotton picker is properly working. If the picker is not working properly during calibration and the problem is fixed during harvest, the calibration may not be representative until re-calibrated.

There are two main brands/types of cotton yield monitors commercially available at present, John Deere and AgLeader. Within these two brands/types the cotton mass flow sensing components vary on how they sense the flow of cotton through the ducts. The two types are categorized as a microwave sensor (John Deere) and an optical sensor (AgLeader). Each of these sensors quantifies the flow of cotton through the air ducts and from that sensor response a cotton mass flow rate is calculated, which used along with field capacity (ac/hr) to calculate yield. Manufacturers suggest that once a cotton picker yield monitor is calibrated, additional calibrations may be needed if changes in varieties, moisture, quality of defoliation, irrigated vs. non-irrigated, or crop conditions occur.

Cotton lint yield can fluctuate due to varying lint turnout percentages from varietal characteristics. It is important to note that yield data can be modified after harvest has been complete in order to account for these variations in lint turnout. By taking yield data that has been collected and analyzing it with computer-based software to incorporate additional data (e.g. turnout), yield and profit maps can have improved accuracy.

Prior to calibrating, a few things to keep in mind are to make sure the cotton picker is setup properly, to read the operators manual for the yield monitor, to check and properly setup the GPS offset and row unit swath width. In addition, the following yield monitor components should be inspected and calibrated.

A short pre-season checklist follows:

Optical or Microwave Mass Flow Sensors – For machines equipped with **optical sensors** (AgLeader) check to ensure that the lenses on the sensors are clean and free of any debris or obstructions prior to harvest. For both sensors ensure that wiring harnesses and sensors themselves are not damaged and appear to be in working order.

Header Height Sensor (if equipped) – Check that the sensor itself is intact and wiring to the sensor has not been damaged. While it may not seem important, if this sensor is not accurately reading when the header is lowered into the crop, data collection may be incomplete; most yield monitors use header height position as a recording trigger. John Deere systems have the option of setting the recording trigger to material flow (regardless of other factors), which generally works well.

Distance Calibration – Verify that the distance you are traveling is the distance that is being recorded. It is not a bad idea to re-calibrate to make sure acreage recordings are accurate. Yield monitors calculate crop yield as a function of acreage rate (field capacity, ac/hr) and mass flow rate. Therefore, if your acreage rate is off by 20%, then your yield estimate is also likely to be off by 20%.

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In-field calibration:

Calibrating the Mass Flow Sensor – A step by step guide for John Deere calibration on a 2600 or 2630 display is provided at the end of this document. Depending on yield monitor manufacturer, you likely need to flag loads as calibration before they are harvested. Then harvest a ¼ to ½ basket of cotton. Weigh each individual basket with a boll buggy equipped with load cells, a scale trailer (used for baler pickers) or a set of truck scales (weigh boll buggy or round module) that you know is accurate and record the weight. After each basket load has been harvested and weighed, the weights can be entered in the yield monitor display. Depending on the brand of the yield monitor, you may be required to enter each load weight after collecting each load or you may be able to enter all five weights at the end. Make sure that the basket and air ducts are completely empty after each load is harvested. Should you have a newer CP690 (2017+) John Deere bale picker with module weighing capabilities, it is still important to calibrate this machine to ensure the weighing arm is correct.

After completing these few steps, the yield monitor should be calibrated and ready for harvest. It is also important to note that as harvest continues throughout the remainder of the season, a separate calibration may need to be completed when harvest switches to another variety or crop conditions change for greatest accuracy. Examples of various yield monitor components are provided on the following pages. These pictures are for example only and do not represent every make and model of harvester or yield monitor component. Clemson University is not endorsing specific manufacturers of harvesters or yield monitor components in this bulletin. If you need assistance with yield monitor calibration, please contact us via the information provided below. Clemson University has mobile platform scales to weigh round modules in addition to boll buggies with load cells to assist with calibration.

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Figure 1. Optical AgLeader Mass Flow Sensors on Air Duct

Figure 2. Microwave John Deere Mass Flow Sensor on backside of air ducts

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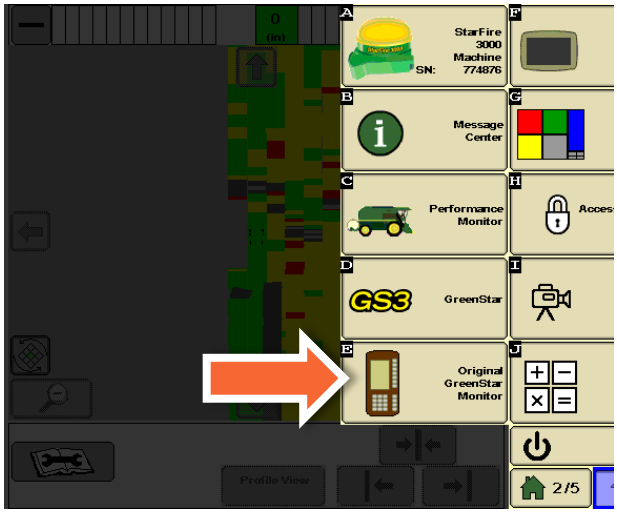
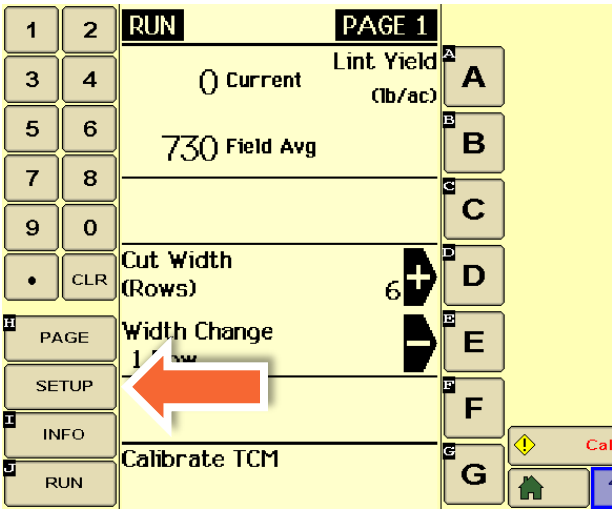
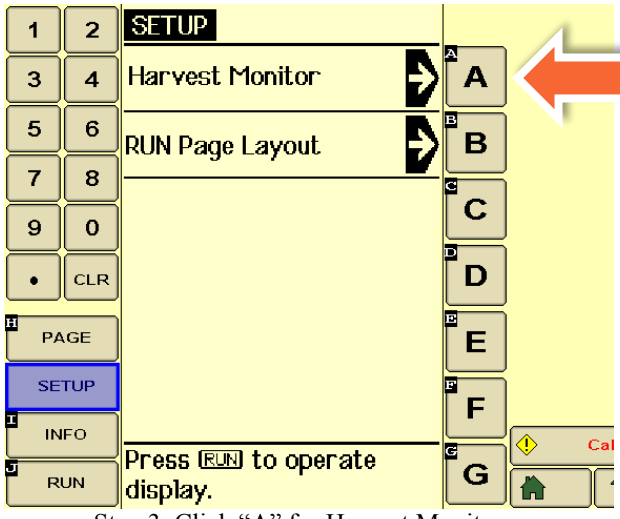
Cotton yield monitor calibration procedure for John Deere 2600 and 2630 displays.



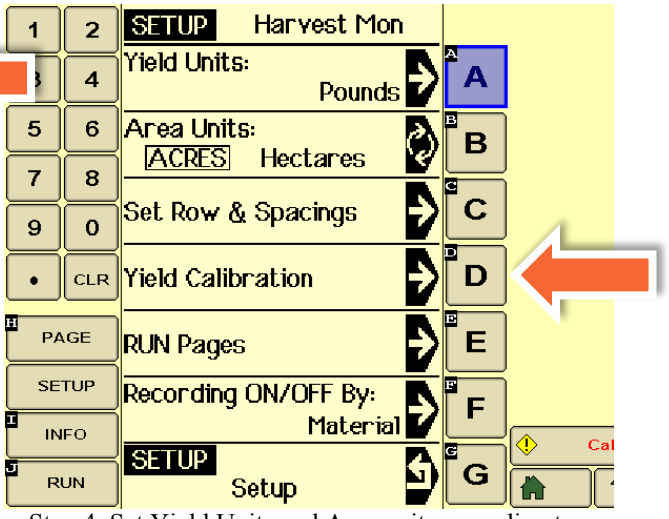
Step 1. From the Menu screen, click the "Original GreenStar" Monitor" button.



Step 2. Click the "Setup" button.



Step 3. Click "A" for Harvest Monitor.



Step 4. Set Yield Units and Acre units according to how you wish for them to be displayed on Run Screen, confirm "Row and Spacings" settings (spacing must be set for each row, a feature that allows support for skip row planting), then click "D" for Yield Calibration.

Note: Recording trigger may be set at "F". This is what controls starting and stopping of yield data collection.

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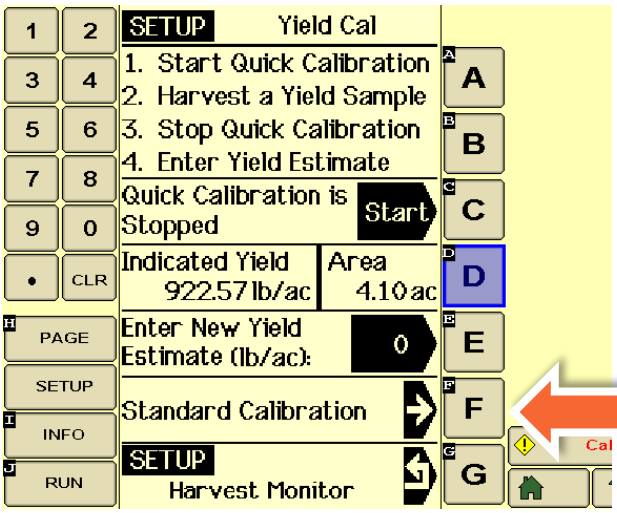
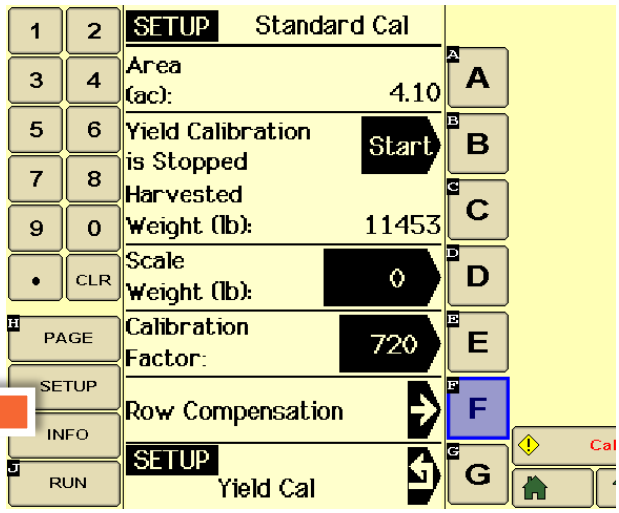
Cotton yield monitor calibration procedure for John Deere 2600 and 2630 displays (continued).



Step 5. We recommend using the Standard Calibration procedure; click "F" for this option.



Step 6. This is where the calibration begins. Once the Start button is clicked, an estimate of weight harvested (using existing calibration factor is provided next to "C". This value will continue to increase as cotton is harvested. After the calibration is complete, a known weight should be entered at "D", which is used to update the calibration factor. Specific procedures vary dependent on picker model; see below.

Basket picker instructions: Ensure that the basket is empty before proceeding. Then click "B" to Start the calibration. Once the desired amount of cotton is harvested (e.g., ½ basket), click the Stop button, which will appear at "B" after the calibration is started. Weigh this cotton and enter its weight at "D" to complete the calibration.

Round module picker instructions: We recommend using at least two round modules. This procedure is completed entirely while the picker is in motion (DO NOT stop the picker to start or stop the calibration). At the moment that the armrest display indicates that a module is being wrapped (red markings on display), click the Start button at "B". The module being wrapped at this time is not a part of the calibration. Continue picking until the instant that wrapping begins on the next module. Make note of where this module is set off in the field; it will be one of the calibration modules. We recommend continuing until at least two round modules are included in the calibration; make note of where each one is set off in the field. At the instant that wrapping begins on the last module used in the calibration, click the Stop button at "B". Weigh all of the modules included in the calibration and enter the sum of the weights at "D" to complete the calibration.

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