

Behind the H2 Design

A BEHIND-THE-SCENES LOOK AT THE H2 GRAINGAGE™

Beginning over 25 years ago when field plot weight was measured using a basic weighing scale, HarvestMaster engineers have worked continually to improve the precision and accuracy of on-combine weighing systems, developing innovative improvements progressively over the years.

Our improvements began with the Classic GrainGage, which automated the measurement process, added slope and motion compensation for on-the-go weighing, reduced errors caused by machine vibration, and adopted multi-sample measurements for higher accuracy. HarvestMaster later introduced a more accurate twin-plot harvesting system, known as the Twin Plot High Capacity GrainGage, which eliminated side-by-side bias common to most conventional twin-plot measurement systems.

And now, we introduce our most advanced harvest data system yet, the H2 GrainGage, combining 25 years worth of technological advancements with new features, including digital signal processing and 3-D accelerometer compensation, to provide extraordinarily accurate and precise data, and doing it faster than ever before.

Before we talk about the new features of the H2, let's go over two critical components required for producing high-quality data:

Accuracy: How close to the actual value the results are.

Precision: How reproducible the results are.



Not Accurate
Not Precise



Accurate
Not Precise



Not Accurate
Precise



Accurate
Precise

WHY ARE PRECISION & ACCURACY IMPORTANT?

A weigh system that is accurate, but not precise will produce data that may be close to the actual value, but isn't repeatable. On the other hand, a weigh system that is precise, but not accurate will produce data with little variation in it, but it may not be even remotely close to the actual value.



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That's why it's essential that harvest data systems be both accurate and precise, in order to produce high-quality data. Consider this example from an actual seed researcher:

"The importance of using an accurate and precise harvest data system became very clear to me when the company I was working for replaced a set of twin buckets with HarvestMaster's Twin Plot High Capacity GrainGage. The number of hybrids we were saving from each trial went from around 15% to less than 10% because of decreased error in our data. Most, if not all, of the reduced error was due to the higher accuracy and precision of the GrainGage (we were planting in the same fields and using the same combine)."

Having high-quality data leads to a series of benefits, ultimately resulting in lower costs and higher revenue.

Higher-quality data



Better decision-making



Fewer varieties needed to be saved



Lower Costs, higher revenue



SO HOW DID WE IMPROVE PRECISION & ACCURACY IN THE H2?

- **Digital signal processing (DSP)** – The H2 uses advanced DSP technology combined with proper front-end anti-aliasing of analog signals to compensate for factors that can skew data—such as starting and stopping the combine, machine vibrations, and varying terrain conditions (such as flat or hilly)—resulting in the highest quality data possible.
- **More consistent measuring** – The H2 features a new design, where moisture and test weight are measured in a single chamber, rather than separately, as is commonly done in conventional systems. This eliminates variability in grain packing, providing you with consistent, reliable data, every time.

- **Reduced irregular grain compaction** – In most harvest data systems, variation in grain compaction often occurs because of machine movement and the variability of grain streams as the sample enters the test weight cup. This often causes significant differences (and error) in test weight data. The H2 features a patented test weight measurement chamber, which provides precise compaction, resulting in minimal unexplained variance in test weight measurement.
- **Improved cabling design** – Within harvest data systems, each sensor and actuator is controlled by attached cables. Through careful engineering, HarvestMaster engineers have improved the H2's cabling in a way that minimizes its effects on the weight measurements, providing accurate data you can trust.
- **Single set of sensors** – Many twin-plot harvest data systems on the market are fitted with an individual harvest data system for each side of the combine, requiring separate sets of calibrations for each side. This introduces undesirable side-to-side bias, adding additional variability into the data. The H2, on the other hand, moves grain from each side of the harvester sequentially through a single set of sensors, eliminating any side-to-side bias in the measurements, thereby improving accuracy.



NOW LET'S TALK ABOUT SPEED...

An average twin-plot combine is expected to harvest an astounding 30,000-40,000 plots per season. With that amount of work, every little bit of time makes a difference. For example, just one second saved per plot will result in a total of **8-11 hours of time saved** over the season! The problem most harvest data systems face, however, is that as speed is improved, oftentimes accuracy goes out the window.

Not so, with the H2. By employing algorithms that compensate for external variables, our engineers have managed to **greatly increase harvesting speed**, while at the same time, actually **improving accuracy**. For example, thanks to its motion compensation, the H2 can attain a level of accuracy in just one second that would typically take a full ten seconds! That means you can **make quicker decisions**, and have **more time** on your hands.



On top of that, you'll spend **less time cleaning** grain out of the H2. Its cleaner, more open design prevents grain from accumulating on its surfaces, keeping the system free of excess grain and reducing maintenance.

WANT TO KNOW WHAT KIND OF PRECISION & ACCURACY YOU'RE CURRENTLY GETTING?

Find out what kind of precision and accuracy you're getting with your current weigh system by doing a simple static weight test:

- 1) Find a location where you're able to drive your combine to simulate a normal plot harvest procedure.
- 2) Place a known weight into the plot bucket and secure it in place (alternatively, you can instead tare the plot weight, using the empty plot bucket as the known weight).
- 3) Ensure that the combine's thresher and head are running.
- 4) Drive the combine to simulate performing 40-50 plot harvests.
- 5) Afterwards, evaluate the data you collect. Notice how close your measurements are to the known weight. Are they off by more than .1 lbs? How consistent are your measurements?

**To get the highest-quality data in less time, contact HarvestMaster to order the H2 today.
www.harvestmaster.com**