

**Problem Statement:**

John Deere's new draper headers have been criticized by farmer customers for losses between the belts. John Deere claims that losses of soybeans, canola, and rape seed are minimal with belt speed adjusted properly. John Deere needs a unit and a system to evaluate the grain losses between belts of their new 635FD, 640FD, and 645FD draper headers.

As shown in Figure 1, there are three places where losses will need to be captured:

1. Between the feeder belt and the feeder house opening
2. On each wing of the header where two belts butt up to each other
3. Between the feeder belt and the cutter bar

A simple, effective solution to help John Deere capture the header loss data on their 600FD series grain heads was produced. This tool enables them to capture harvest losses incurred throughout the head. Having these capturing devices is critical to accurately evaluate how well the head performs in the field and also in the specific type of crop that it may be harvesting.

**Impact:**

There currently is not a published study to prove or disclaim what is actually being lost. However, belt losses are expected to be in the 1 to 2 percent range over a defined area depending upon field and operating conditions. Determining the losses occurred will help to provide answers on what is truly being lost and costing farmers money. Avoiding this issue will be possible in the future thanks to the current research being done.

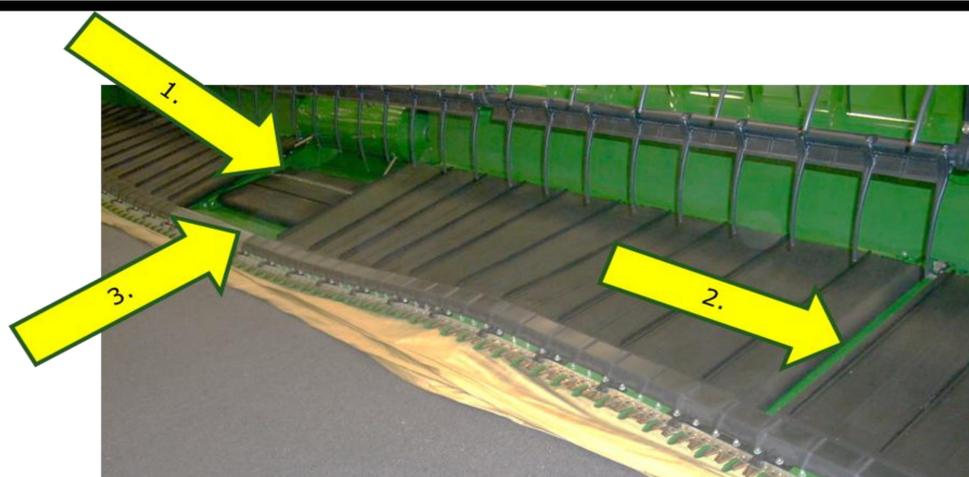


Figure 1: Locations of Loss

**Design Criteria and Constraints:**

Pans must be:

- Lightweight and compact
- Flexible and free from moving objects
- Able to be mounted to existing locations on the head
- Accessible and easily removable
- Able to hold enough grain to accurately determine losses over a given area



Figure 2: Wing Belt Pan



Figure 3: Center Pan Latch



Figure 4: Center Pan

**Testing and Implementation:**

A future testing and operating procedure will be determined in order to properly measure the loss coming off of the draper header with these pans. The first step in this testing procedure would be to harvest a defined area of either small grains or oilseeds and collect the loss. Later after collecting the samples, compare the total weight harvested to the total weight held within the pans to determine the percent loss.

**Design and Fabrication Process:**

- Ideas were brainstormed and initial thoughts and solutions laid out on the table
- Initial measurements were taken to produce AutoCAD drawings
- Cardboard was used to create basic panel dimensions of the pan sides
- Lexan plastic was utilized for the prototype to provide accurate dimensions and allow flexibility in cutting and shaping
- Dimensions were transferred onto 16 gauge sheet metal and cut to fit for final assembly
- Metal was sheared, cut, bent, welded, and drilled into tight-fitting pans
- Latching mechanisms were attached to the pans as shown in Figure 3
- The pans were then painted and UHMW poly skids were added along with weather stripping

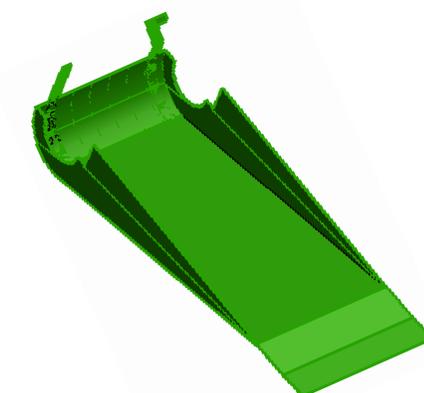


Figure 5: Wing Belt Pan AutoCAD Drawing

**Budget:**

Product	Cost
Lexan Plastic	\$60.00
16 Gauge Sheet Metal	\$80.00
Seals and Gaskets	\$20.00
Paint	\$20.00
UHMW Polycarbonate	\$50.00
<b>Total</b>	<b>\$230.00</b>