A Quick, Easy Method to Measure Harvest Loss in Pinto or Great Northern Bean Fields

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This method combines three key elements necessary for quick, easy, yet appropriately accurate measurement of harvest loss by producers in fields of Pinto or Great Northern beans:

1. It is easy. No weighing or calculators are necessary.
2. It is fast. Each sample should take less than 3 minutes.
3. It provides sufficient accuracy for growers to make good decisions while harvesting. Each sample includes 5 ½ sq. ft. of field area. Three random sample locations within the field are strongly recommended.

This system incorporates use of a measuring frame of specific dimensions, made ahead of time in any farm shop. These dimensions allow the number of bean seeds counted within the measuring frame to be converted directly to bu/A of harvest loss without weighing the beans or without using a calculator to make complicated calculations. The frame size must be 12 inches long by 66 inches wide, inside dimensions. Suggested construction is from ⅜ inch diameter rod. Apply heat to make square corners and weld mating ends to make a complete rectangle shape. Weld in one cross member near the center of the 66 inch dimension, also of ⅜ inch diameter rod, to make the frame more rigid. You can carry this measuring frame in your pickup, or even your combine cab.

Here is how the system works: Toss a rock or some object into the field to locate a random area to measure. Center the measuring frame on the object and position the frame so the 66 in. length of the frame is perpendicular to the direction of combine travel. Count all bean seeds found within the frame area, including loose seeds, broken seeds, or seeds still in un-threshed pods. Divide this total number of bean seeds by 10 and the result will be the bu/A of total harvest loss. Make this measure in three random locations within the field and average the results for a more accurate estimate of field harvest loss.

As an example, suppose you find a total of 43 bean seeds inside the frame at the first sampling location in the field. Dividing 43 seeds by 10 results in a measured field loss of 4.3 bu/A at this first site (Figure 1).

There are several limitations or ‘compromises’ with this system. The frame must measure 12 in. by 66 in. inside dimensions (or 5.5 sq. ft.). This frame size was designed to work only with Great Northern and Pinto sized bean seed. It will not work with smaller or larger sized seed such as Navies or Light Red Kidneys. Because this system is based on one seed size (an average of locally grown Great Northern and Pinto beans), there will be a small error if the particular seed is very small or very large. But the error will be relatively small.

Another question might be: “Should the area sampled include the area directly behind the threshing/cleaning area of the combine, or only behind the combine header but not include the area behind the center of the combine?” The answer depends on whether you want to include threshing/cleaning loss in addition to header loss, or header loss only. Usually, combine threshing and cleaning losses are relatively low, less than ½ bu/A. Since threshing/cleaning losses are usually not spread over the entire width of cut, these measured losses need to be proportioned across the width of the header, adding a complication usually unnecessary. For direct harvest, the focus is generally on header loss, so we recommend the sampling locations for this technique be taken near the ends of the combine header and not be taken in the center of the combine pass.

Figure 1. Frame for measuring harvest loss in Great Northern and Pinto bean fields. There were 43 bean seeds found within the frame in this photo. Divide 43 by 10 and the total field loss is 4.3 bu/A.