Avoid errors in yield map data

Precision agriculture has become an important concept for farmers to manage their fields. In this system, farmers grid fields into smaller units to make management decisions for each grid zone rather than the field as a whole. For example, farmers will prescribe fertilizer rates and seeding rates for each grid rather than using the same rate across the field.

An important component of precision agriculture is the yield monitor, found in most modern combines, which records yield as the combine moves across the field at harvest time. However, at a given time during the harvest, a specific value may be inaccurate because of the methods used by the monitor to estimate yield.

Most farmers understand the importance of yield monitor calibration for generating accurate yield estimates, but other errors can impact both the accuracy and the spatial integrity of yield data. Spatial refers to given space in a field that is identified with a global positioning system (GPS).

Spatial integrity of yield data becomes very important when the data is used to generate prescriptions or maps. Yield data inaccuracies will become a problem when using yield maps to create management zones and subsequent input decisions by zone within a field.

Because of these potentials for inaccuracies, farmers take the time after harvest to evaluate the quality of the yield data and remove any section of values that are questionable. By removing the erroneous data, the farmer can be confident that prescriptions and other future management maps are made from correct yield data.

When processing yield data, farmers and consultants will look for the following types of errors: header height setting, quick stop-start errors, flow delay setting, and header/platform width setting. Each of these errors will result in inaccurate yield estimates and yield maps. The following describes these potential errors:

1. Incorrect header height setting: Can result in data being collected when the combine is not harvesting the crop. This error often results when low or zero-yield values have been collected in headland or point-row areas during the time the combine was turning around to harvest another strip in the field.

2. If this error is not recognized and addressed, the yield estimates for zones that include headland areas will be underestimated due to additional acreage being measured with little or no additional crop harvest. Farmers should remove the turning data points before any zone or spatial analysis is completed.

3. Quick start-stop errors: The accuracy of the yield monitor calibration depends on consistent flow of material through the combine. Sudden changes in ground speed may result in areas where yield estimates are incorrect.

4. Often yield is overestimated where a sudden stop occurred and then underestimated as the combine ramps back up until material flows at a steady rate. These areas of quick start-stop activities should be removed from the data set.

5. Flow delay setting: When it is incorrect, it will result in each mass flow estimate being attributed to the wrong location in the field. This causes not only a spatial error, but also a miscalculation of yield when the combine’s speed is changing.

This error is often easiest to spot around the perimeter of the field on the yield map, but the data is offset for the entire length of the field and not only at the edges. Farmers need to make sure the flow delay setting is correct and not use data if evidence suggests a problem in this setting.

6. Header width error: Having an accurate estimate of the area being harvested is key to having accurate yield estimates. A common problem occurs when the corn or platform header is not being operated at full capacity and the header width setting is not updated to reflect this change in the yield monitor.

When this happens, the amount of crop estimated is divided over a larger area than actually harvested, resulting in an underestimation of yield. These errors most commonly appear in yield maps as straight lines down a pass or in fields with point rows.

One needs to either adjust the harvest width for these points or remove these data values from the map before analyses.

These are just a few of the common errors that can cause problems with yield map data. Farmers identify and fix these problems to ensure that they are using high-quality data.

Ohio State University recommends fixing or removing these potential erroneous data areas if using yield maps to create new maps looking at yield zones, profit zones, nutrient removal, nutrient recommendations, and seeding rate.

More information may be found on detecting these errors and general information on precision farming at www.OhioStatePrecisionAg.com.

Lentz is extension educator for agriculture and natural resources for The Ohio State University Extension Service in Hancock County. He can be reached at 419-422-3851 or via email at lentz.38@osu.edu.

Lentz can be heard with Vawn Wickerham on weekdays at 6:35 a.m. on WFBN, at 5:43 a.m. on WXXA-FM, and at 5:28 a.m. at 106.3 The Fox.