ANSI/ASABE S598 JAN2010 (R2019)
Procedure for Sampling, Measuring and Reporting Commingled Crop in Combine Harvest of a Subsequent Crop

American Society of Agricultural and Biological Engineers

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Developed by ASABE Grain Harvesting Committee and approved by the Power and Machinery Division. Adopted as an ASABE and American National Standard January 2010; reaffirmed January 2015, December 2019.

Keywords: Biotech, Clean, Combine, Commingled, Genetically Modified, GMO, Grain

1 Purpose and Scope

1.1 This standard establishes a method to estimate the percentage of commingled grain or seed from a previously harvested crop present in that of the next crop subsequently harvested by a combine harvester.

1.2 A standardized estimate of the level (percentage) of commingled grain present after cleaning all or parts of a combine harvester and/or flushing with a quantity of grain is produced from these procedures. Because of differences among various large- and small-seeded crop varieties as well as other harvest factors, estimates from this procedure should only be used as a comparative guide between machine treatments using these procedures and not as an absolute value of maximum commingled grain percentage for all crop conditions or any single sample value from one of the crops tested. This standard is without warranty of any kind, either expressed or implied. In no event shall the producers of this standard be liable for any damages including lost profits, lost savings or other indirect, incidental or consequential damages arising out of the use or inability to use this standard.

2 Normative References

ASAE/ISO 5687, *Equipment for harvesting — Combine harvesters — Determination and designation of grain tank capacity and unloading device performance*

ASAE 343.3, *Terminology for Combine and Grain Harvesting*

ISO 6689-1:1997, *Equipment for harvesting — Combines and functional components — Part 1: Vocabulary*

ISO 6689-2:1997, *Equipment for harvesting — Combines and functional components — Part 2: Assessment of characteristics and performance defined in vocabulary*

3 Terminology and Definitions

3.1 commingled grain: Grain, oilseeds, or edible beans from an earlier harvested crop that is present in collection of grain, oilseeds, or edible beans from a subsequent harvest.

3.2 separator, belt: A moving, inclined belt separator to separate spherical from non-spherical material. Non-spherical particles continue moving up with the belt to a catch bin while spherical-shaped particles roll down the

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inclined moving belt (opposite to belt movement) into a separate catch bin. Belt incline and speed may be varied to improve separation.

3.3 separator, spiral: A spiral separator of one or more helices to separate spherical from non-spherical material. Unseparated material enters the top of an inner helix. As round particles pick up speed, centrifugal force causes them to roll over the edge of the helix into an outer helix or catch trough, while non-spherical particles continue down the inner helix into a separate bin.

3.4 Other combine terminology is defined in ASAE S343.3 and ISO 6689-1 and ISO 6689-2.

4 Test Conditions

4.1 Harvest will alternate between two crops of different grains, oilseeds, or edible beans that can be separated by some reasonable method to accommodate measurement of commingled grain concentration from prior crop in a subsequently harvested crop. Corn and soybean crops are specifically referred to as examples throughout this standard, however, other crops that can be reasonably separated by available grain sorting equipment may be used instead. Separate gathering heads (i.e. corn head, grain platform) will be used as required for harvest.

4.2 Crop conditions should be reasonable for harvest and noted in published test results.

4.3 The combine shall be tested with features readily available in the marketplace. If specific modifications are made before tests they should be noted in published test results.

5 Test Procedure

5.1 General procedure

5.1.1 Harvest alternates between corn and soybeans with four samples collected at the exit of the conveyor during unloading of the first grain tank of subsequent crop. These samples are used for inspection of commingled grain concentration from the prior crop. Specifically a sample is collected after unloading approximately 20 l (first bu), 710 l (20th bu), 3540 l (100th bu) and the last 20 l unloaded from the grain tank (last bu).

5.1.2 Because the amount of commingled grain becoming entrapped in the combine has a significant range of variability, three clean-outs with subsequent sampling within each crop (six total cycles of alternating between corn and soybean) are used to measure commingled amount.

5.1.3 To accomplish loading of the combine with grain yet allow tests to be accomplished in a timely manner, a minimum of four grain tankfuls of corn or two grain tankfuls of soybean are harvested before clean-out (if desired) and then harvesting the alternate crop and collecting commingled samples. If other crops are used, a minimum of two grain tankfuls are to be harvested between collections of a set of commingled samples so that the grain tank has been filled multiple times. Additional harvest (up to four tankfuls) is desirable between collections if harvest conditions allow this amount of time.

5.1.4 All safety measures or practices as outlined in the operator's manual shall be followed.

5.2 Collection of commingled samples

5.2.1 Collect grain exiting unloading auger in samples with an average size of 2.7 kg (6 lb) or greater. Four samples shall be taken at intervals specified in 5.1.1 to evaluate commingled grain concentrations after flushing with specific amounts of subsequent grain but before collection of subsequent crop.

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