ASABE S658-3 DEC2023
Singulating Seeding Equipment Test Methods Part 3: Seed Spacing Performance

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ASABE, 2950 Niles Road, St. Joseph, MI 49085-9659, USA, phone 269-429-0300, hq@asabe.org.

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0 Introduction/Background

This part of the ASABE S658 series contains methods for testing singulating seeding equipment (example: row crop planters/seeders) and methods for reporting the results. The starting point for development of this ASABE standard series was ISO Standard 7256-1:1984. Since that time, singulating seeding equipment design has significantly improved seed spacing performance and planting field speed. It is the intent of this standard to provide updated methods for testing the singulating and delivery mechanisms of these modern planters/seeders which will reflect the improved singulating performance. Thus, some testing methods and some reporting terminologies of ISO 7256-1 have been retained, while other methods and terminologies have been modified or added. For example, the terms “misses” and “multiples” are similar to those of ISO 7256-1. The terms “true misses” and “true multiples” have been added to distinguish actual seed misses and seed multiples from long seed spacings or short seed spacings. Similarly, the reporting parameter “spacing deviation group percentages” has been added to provide a broader and more refined seed spacing description than the CV related terminology used in ISO 7256-1.

The optional corrected seed spacing distribution parameters further refine the seed spacing performance measurement by accounting for front-to-rear distribution of the seed as it exits the seed delivery mechanism and is then directed to the theoretical seed furrow. Increased computer and sensor capabilities have made this possible and useful to more accurately assess the seed delivery performance.

The optional test procedures for front-to-rear and side-to-side distributions of the seed as it passes through the horizontal plane of the theoretical seed furrow bottom provide additional and more complete information describing the trajectory of the seed as it leaves the planter/seeder mechanism, and the actual seed spacing performance of the planter/seeder. The side-to-side pattern is important to reflect how or if the seed reaches the bottom of the seed furrow. Seed delivered far to either the left-or-right of the center of the furrow may not go into the furrow, or may go into the furrow sidewall and not be at the proper depth for good seed germination. The front-to-rear seed path information is used to further refine actual seed spacing in the direction of equipment travel. In some situations, not all seeds follow the same trajectory when leaving the seed delivery device and this trajectory information can be used to more accurately measure seed spacing and seed delivery performance.

It is important that all the seed spacing parameters required in this test standard be utilized together to obtain the most accurate and reliable measure of seed spacing performance of the planting equipment tested or compared. No single parameter alone will provide accurate or complete information of planter/seeder seed spacing performance.

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1 Scope

The ASABE S658 standard is divided into three parts:

ASABE S658-1, Singulating Seeding Equipment Test Methods Part 1: General Information

ASABE S658-2, Singulating Seeding Equipment Test Methods Part 2: Monitoring Systems Performance

ASABE S658-3, Singulating Seeding Equipment Test Methods Part 3: Seed Spacing Performance

The scope of this part of the S658 standard series is to define a test method for measuring the predicted performance of seed placement within the in-ground state (seed furrow) just after seed is dispensed from the row unit without accounting for the various dynamic effects after release from the seed delivery system.

An Excel workbook in which row unit test data can be entered, and which will perform the necessary calculations and copy the results into the report documents and prepare the necessary graphs can be downloaded from https://www.asabe.org/S658**. Instructions and information for using the workbook are in the Instructions tab of the workbook.**

This standard allows for evaluation of machine performance or comparison of results within a given facility. This type of comparison testing can only be possible if all factors (i.e. test process, test setup, test methods, seed characteristics, instrumentation, and environmental effects) are managed, administered, and replicated exactly the same and therefore results are only valid for comparison within a test location. The standard is anticipated to be performed within a laboratory environment facility and not in an actual field.

Note: All Annexes referenced within the ASABE S658 standard series are located in part one, ASABE S658-1, Singulating Seeding Equipment Test Methods Part 1: General Information.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ASABE S658-1, Singulating Seeding Equipment Test Methods Part 1: General Information

ASABE S658-2, Singulating Seeding Equipment Test Methods Part 2: Monitoring Systems Performance

3 Definitions and Terminology

For the purpose of this document, the terms and definitions found in ASABE S658-1 apply.

4 General Requirements for All Tests

For the purpose of this document, general testing requirements found in ASABE S658-1 apply.