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Singulating Seeding Equipment Test Methods Part 2: Monitoring Systems Performance

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0 Introduction/Background

Electronic monitoring systems are now a necessary component of modern singulating seeding equipment operation. Singulating seeding equipment advances including high field speed designs, variable rate seed population, GPS controlled individual row shut-off, and multiple variety capability require accurate real-time monitoring of seed spacing and population performance by the planter/seeder operator. Monitoring systems have evolved from the simplistic concept of seed meter drive shaft motion detection, to sophisticated sensing of seed delivery from the planter/seeder mechanism, planter/seeder field speed, calculation algorithms that accurately determine seed spacing as the seed is delivered to the seed furrow, and descriptive parameters that appear on the electronic monitoring systems terminal that convey to the operator actual seed delivery performance of the planter/seeder system. Just as there is a need for standardized methodology to evaluate and compare seed delivery performance of singulating seeding equipment units (See ASABE S658-3), there is a parallel need for a standardized method to evaluate, compare, and report performance of monitor systems.

The core concept of this standard is to input to the sensor system multiple specific and unique patterns of stimuli that represent seed passing through the seed delivery mechanism of the planter/seeder, and then comparing the resulting monitor system output to the known seed spacing parameters of the input patterns. All components of the monitor system are included in this testing methodology including the seed sensors used within the planter/seeder mechanism, necessary speed or time sensors, data collection and manipulation, and the prescribed display output parameters. To evaluate a full picture of monitor performance under a wide variety of potential monitor and planter/seeder applications, this test procedure includes testing of two monitor units; two seed sizes; three flow rates; five input seed spacing stimuli patterns; and three replications of each of these combinations.

This part of the ASABE S658 series test measures the performance of the seed sensor and monitor electronics and reporting algorithms but does not measure how well the monitor system measures the final seed spacing performance delivered to the furrow by the row unit.

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