

Seed drills —

Part 1: Methods of test for single seed drills

[ISO title: Sowing equipment — Test methods — Part 1: Single seed drills (precision drills)]

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- AFRC Institute of Engineering Research
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- Agricultural Engineers' Association
- British Agrochemicals Association Ltd.
- Health and Safety Executive
- Imperial College of Science and Technology
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National foreword

This Part of BS 6978 has been prepared under the direction of the Agricultural Machinery and Implements Standards Committee. It is identical with ISO 7256-1:1984 “*Sowing equipment — Test methods — Part 1: Single seed drills (precision drills)*”, published by the International Organization for Standardization (ISO).

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Wherever the words “part of ISO 7256” appear, referring to this standard, they should be read as “Part of BS 6978”.

Cross-reference. ISO 7424, to which reference is made in the text for information only, has been withdrawn.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

0 Introduction

The aim of this part of ISO 7256 is to make available to test offices and other interested organizations a standardized test method permitting reproducibility of tests when they are carried out in geographically remote areas and/or in different climatic conditions; the main objective being comparability for any one model of equipment.

This condition of reproducibility limits the number of mandatory tests which can be used and eliminates mandatory tests in the field. However, these tests may be carried out optionally at the instigation of the test office or at the request of the manufacturer.

1 Scope and field of application

This part of ISO 7256 specifies test methods for single seed drills (precision drills).

2 Reference

ISO 7424, *Agricultural equipment — Matching of wheeled tractors and rear mounted implements — Code numbering system*.

NOTE A future International Standard will deal with classification and terminology of equipment for sowing and planting.

3 Definitions

For the purpose of this part of ISO 7256 the following definitions apply.

3.1

single seed drills (precision drills)

drills whose metering mechanism distributes seeds singly by means of a burying device at predetermined intervals to form a sowing line

NOTE As the great majority of sowing equipment has equidistant spacings, the tests refer only to this type of equipment.

3.2

sowing unit (for seed)

unit generally comprising the metering mechanism and the burying device

3.3

metering mechanism (for seed)

mechanism which takes seeds from a batch leaving the hopper individually or in groups and deposits them in a line (or row)

3.4

burying device

device generally comprising a coulter, a device to regulate the ground penetration depth of the coulter and a unit that covers the seed

3.5

coulter

device for opening a furrow in the ground in which the seeds leaving the metering mechanism are placed

3.6

flow rate

amount of seed distributed, expressed as a number, mass or volume of seed per unit of time¹⁾

3.7

application rate

amount of seed distributed, expressed as a number, mass or volume of seed per unit of length or surface¹⁾

3.8

spacing

the distance between two successive seeds in the row

theoretical spacing

spacing set on the control mechanism and stated by the manufacturer

3.9

miss

for a single seed drill, the absence of a seed where there should be one theoretically. In practice, by analogy with statistical evaluation of results, all spaces larger than 1,5 times the theoretical seed spacing are considered to be misses (see 6.1.1)

3.10

multiples

for a single seed drill, the presence of two seeds or more where there should only be one. In practice, by analogy with statistical evaluation of results, all spacings less than 0,5 times the theoretical seed spacing are considered to be multiples (see 6.1.1)

4 General test conditions

4.1 Seed drill

4.1.1 Selection

The seed drill to undergo testing may be selected by the representative of the test office in agreement with the manufacturer.

¹⁾ For precision drills, only the number is to be taken into consideration for flow rate and application rate measurements.

The seed drill shall, in all respects, conform strictly to the specifications, which the manufacturer is required to send to the test office in writing.

The test report (see Annex F) shall specify how the drill to be tested was chosen.

4.1.2 *Manufacturer's instructions*

Use the drill in accordance with the manufacturer's instructions, which shall specify, among other things

- a) the maximum forward speed and, if appropriate, the minimum forward speed, expressed in metres per second;
- b) the maximum, and if appropriate, the minimum number of revolutions, expressed in minutes to the power of minus one (min^{-1}), and/or peripheral speed, expressed in metres per second, of the metering mechanism;
- c) the species and types of seed which may be sown;
- d) the metering mechanisms suited to each seed species.

4.1.3 *Checking of specifications*

The technical characteristics supplied by the manufacturer shall be indicated in the test report and shall be checked.

4.2 *Seed*

4.2.1 *Types*

The tests shall be carried out taking into account the manufacturer's specifications.

4.2.1.1 *Single-purpose drill*

If the seed drill is stated to be specifically for one or more types of seed and/or distribution methods, the test shall be carried out exclusively with the seeds indicated by the manufacturer, and, as appropriate, of the size specified.

4.2.1.2 *Multipurpose drill*

If the drill is stated to be multipurpose, the tests shall be carried out with the following four types of seed:

- type a: a medium size round seed $3 \pm 0,75$ mm in diameter (for example, pea or a coated seed the coating of which shall be smooth and of a regular shape);
- type b: a small seed of regular shape (for example, cabbage) of diameter less than 3 mm;
- type c: a large irregular seed (for example, bean or flat maize seeds) of diameter greater than 6 mm;

— type d: the most difficult seed permitted by the manufacturer (for example unpelleted genetically monogerm beet seed, carrot, etc.).

NOTE The seeds shall not have been subjected to any treatment which could change their physical properties, except that incorporated in the coatings.

4.2.2 *Characteristics*

The dimensional characteristics (scale and granulometric profile), purity (percentage of foreign bodies, bad seeds and broken seeds) and water content of the batch of seeds used shall be noted in the test report.

4.3 *Ambient conditions*

The hygrometric levels shall be observed and noted in the test report.

5 *Mandatory tests²⁾*

5.1 *Nature of test* (see Annex A)

The mandatory tests deal essentially with the precision of seed planting and the efficiency of metering.

Each test shall be carried out with three different units, either three units on one multirow drill or three independent sowing units if each one has a metering mechanism.

Tests 1, 2, 3 and 6 (see Annex A) shall be carried out with the sowing unit either static or mobile.

Test 4 (see Annex A) shall be carried out with the sowing unit mobile.

Test 5 (see Annex A) shall be carried out with the sowing unit moving over a bed of sand.

5.1.1 *Static tests*

With the sowing unit stationary, the metering mechanism shall be driven at a rotary speed equal to that which it would have for actual work, i.e. taking into account the theoretical forward speed and the adjustment of the ratio between the metering mechanism and the driving wheel speeds. In order to simulate the relative movement of the drill above the ground, an adhesive strip moving at the relative forward speed of the drill when travelling without slipping may be run underneath the seed drill.

NOTE This recording on to an adhesive strip may be replaced by any other recording method, such as an acoustic or optical method. The method used shall be noted in the test report.

5.1.2 *Mobile test*

The sowing unit shall be fixed to a mobile trolley moving at a constant speed and without jolting over a stationary adhesive strip.

²⁾ For optional tests see Annex E.