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Agricultural machinery — Equipment for sowing — Minimization of the environmental effects of fan exhaust from pneumatic systems

AMENDMENT 1

Matériel agricole — Semoirs — Considérations pour réduire au minimum les effets de l'échappement du ventilateur des systèmes pneumatiques

AMENDEMENT 1

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This document was prepared by Technical Committee ISO/TC 23, Tractors and machinery for agriculture and forestry, Subcommittee SC 3, safety and comfort, Working Group WG 14, Environmental aspects of seeding equipment.

This document amends the first edition (ISO 17962:2015.

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Agricultural machinery — Equipment for sowing — Minimization of the environmental effects of fan exhaust from pneumatic systems

AMENDMENT 1

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Modify clause 3.1 to read:

3.1 General

A means of minimizing the effects of fan exhaust from pneumatic systems shall be employed using either of the methods found in 3.2, 3.3 or 3.4.

The application of design principles is an acceptable means to minimize the effects of fan exhaust. Alternatively, testing methods can be used to verify conformance.

Modify title of 3.3 to read:

3.3 Field test method

Add the new sentence in clause 3.3.1.1 as follows:

The testing area shall be a field that has been prepared for sowing. The test area shall be either level tilled soil or plant material not greater than 10 cm above the soil surface.

Modify in 3.3.8.2 the reference to renumbered subclause 3.6 Test result report as follows:

3.3.8.2 The mean value (percentage of sediment from the emitted tracer powder) from the 90 measured values (30 for each test), shall be calculated and recorded per 3.6.3 c).

Add new clause 3.4 with subsequent subclauses and new Figure 3 as follows:

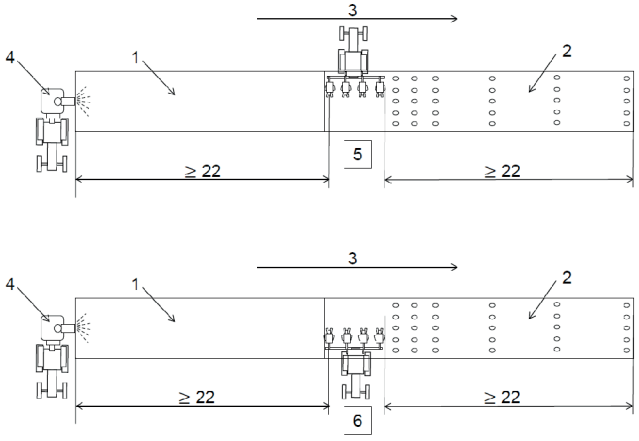
3.4 Wind tunnel test method

3.4.1 Testing area

3.4.1.1 The testing area shall be a wind tunnel (Figure 3). The floor surface of the wind tunnel shall be a soil prepared for sowing as specified in the operator's manual. The test conditions of the soil shall be recorded in the test report.

Following the flow of air, the tunnel will continue around the sowing equipment providing a hole as small as possible allowing to place the equipment into the tunnel.

Dimensions in meters



Key

1 – Tunnel zone to uniform artificial air stream
2 – Area monitored with artificial collectors (Petri dishes)
3 – Artificial wind direction
4 – Fan
5 – Position A (sowing equipment position)
6 – Position B (sowing equipment position)

Figure 3 — Scheme of wind tunnel and of positions (A and B) of the sowing equipment to be tested

3.4.1.2 A fan shall be positioned at one side of the tunnel. The fan shall be capable of delivering an air speed as described in 3.4.3.3.

3.4.1.3 There shall be a uniform air stream close to sowing equipment tested. The air stream shall be measured at 4 evenly spaced heights and 4 evenly spaced widths (16 total data points), 5 meters upwind from the end of the sowing equipment being tested. The coefficient of variation (CV) of the wind speed measurements shall be less or equal to 10%.

3.4.1.4 The sowing equipment shall be tested in two positions A and B (Figure 3). One position (A) is with the air stream moving transverse the direction of travel of the sowing equipment from left to right. The second position (B) is with the air stream moving transverse the direction of sowing equipment travel from right to left. The release point of the vacuum fan shall be at least 22 meters from the end of the wind tunnel.

3.4.1.5 Tests shall be made using the sowing equipment in a static position with seed distribution system charged.

3.4.2 Measuring area

3.4.2.1 Downwind area from the sowing equipment position, arrays of 5 artificial collectors (Petri Dishes, with a diameter of 150 ± 15 mm) shall be placed on the ground at distances from the downwind edge of the equipment of 1, 3, 5, 15 and 20 m ± 0,1 m. In each array, Petri Dishes shall be placed at 1 m ± 0,1 m spacing. Include filter paper and moisten with (5-10) ml of water.

3.4.3 Test conditions/parameters

3.4.3.1 The sowing equipment shall be set up per the manufacturer's recommendations for the shape and size of the field (dent) maize seed being sowed.

3.4.3.2 Hoppers of the sowing equipment shall be filled with undressed seeds and the disc of the seeding elements inserted into the soil at a depth of (40-50) mm. Use the same parameters described in 3.3.4.1 and 3.3.4.2.

3.4.3.3 The wind speed in the wind tunnel shall be 3 m/s ± 0,5 m/s. The wind speed measurement shall be taken at the location as described in 3.4.1.3.

3.4.4 Test procedure

a) Place the artificial collectors as in 3.4.2.1 (see Figure 3)

b) Operate the sowing equipment per the manufacturer's recommendation for the shape and size of the field (dent) maize seed, the seed distribution system shall be charged but seed need not be flowing during the test

c) Using a dust dosing feeder, fluorescent tracer powder of a specified particle size in Annex B shall be fed into each fan inlet at a rate of 3 g ± 0.1 g min-1 for 10 minutes

d) Repeat the tests three times for each sowing equipment position (A and B)

e) Measuring method

The direct drift shall be measured as soil sediment.

3.4.5 Test evaluation

3.4.5.1 The amount of tracer deposited on each artificial collector shall be determined in laboratory by fluorimetrically analysis.

3.4.5.2 The mean value (percentage of sediment from the emitted tracer powder) of all collectors shall be calculated.

Renumber subsequent clauses and modify current clause 3.4 to become 3.5 as follows:

3.5 Acceptance criteria

3.5.1 For the principle of design method, acceptance is conformance to clauses 3.2.2.3, 3.2.2.4, 3.2.2.6, and 3.2.2.7.

3.5.2 For the test method (3.3 and 3.4)

The maximum permissible drift value shall not exceed 1,5 % of the applied tracer powder to pass the test. The maximum permissible drift value to pass the test shall be the mean of the measured values from 3.3.8.2. or 3.4.6.2.

Renumbered subsequent clauses and modified clause 3.5 to become 3.6 and modifying the text to include the test report requirements for design method and including wind tunnel method in test report section

3.6 Test result report

The test result report shall include (as a minimum) the following:

3.6.1 For all tests:

a) manufacturer of the sowing equipment;

b) type of sowing equipment;

c) characteristics of the sowing equipment tested, for example number of sowing elements, distance between rows;

d) configuration of the sowing equipment tested (sketch or pictures useful);

e) the sowing equipment air outlet arrangement (sketch or pictures useful);

3.6.2 For principle design method:

a) air velocity measurements at 8 locations as defined in 3.2.2.3

b) height of the air velocity measurement cylinder per 3.2.2.6

c) height of the air velocity measurement cylinder per 3.2.2.7

3.6.3 For test method (3.3 and 3.4):

a) mean weather conditions (temperature, wind speed, wind direction, humidity) during the test;

b) the measured values of tracer dye per collector for every collector;

c) the mean value of tracer dye in the collectors;

d) the amount of the emitted tracer dye;

e) percent of applied fluorescent tracer powder as defined in 3.4.

Add new Annex B (informative) to read: